Appendix I

Environmental Impact Statement Comments and Responses

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Scoping Comments and Responses

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The Environmental Impact Statement (EIS) Team recognizes that the Environmental Impact Statement Preparation Notice (EISPN) identified environmental justice as a resource to be analyzed. However, Executive Order (EO) 14148 "Initial Rescissions of Harmful Executive Orders and Actions" (90 Federal Register 8237) and EO 14173 "Ending Illegal Discrimination and Restoring Merit-Based Opportunity" revoked prior EOs requiring the analysis of Environmental Justice concerns under the National Environmental Policy Act (NEPA). Therefore, a discussion of environmental justice is not carried forward as a resource section in the EIS.

The EIS Team also notes that the acreage presented during scoping and in the EISPN double-counted one easement area and has, therefore, been reduced from 8,348 acres to 8,172 acres (176-acre reduction in the easement area). The original acreage presented in scoping and in the EISPN appear in scoping comments, these numbers have not been changed. The corrected acreage is reflected in the EIS Team's responses to comments and in the EIS.

Table I-1 Public Scoping Comments and EIS Team Responses

Letter ID	*Commenter Name*	*Organization*	*Comment Number*	*Original Public Scoping Comment*[1]	*EIS Team Response*	*Resource/ Section*
1	Catherine Orlans	n/a	1	Even if an EIS is completed, the Hawaiʻi community across all islands have lost faith in the NAVY leadership specifically for their lack of transparency and how they have handled the Red Hill Fuel Spill on Oʻahu. We donʻt want more detrimental enrivonmental impacts on other islands. Go away. The community wants the land agreement expire. Landback for our inidigenous host culture and the ongoing illegal occupation of the Hawaiian Kingdom.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix C, and Section 5.1 (Consistency with Government Plans and Policies) of the Draft EIS. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action	General Opposition to Navy, Land Use and Access

[1] This column only reproduces commenters' original text. Original comments are included as they were submitted following Table I-1.

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					alternative includes additional development. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
2	Nicholas Franklin	HHSC-KR	1	Thank you for your service in protecting America. As a Kauai resident since 2019 I appreciate the contributions of this joint venture. Beyond the strategic mission, PMFR and NASA are the third largest employer on Kauai with over 1000 employees per public records, contribute to our national defense in ways I'm certain I will never know and provide community engagement with fireworks on July Forth. These are simplified and not all encompassing statements.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Thank you for recognizing services provided by PMRF and NASA. Additional information about Navy and NASA's mission and use of these lands is included in Section 1.3 (Background) of the Draft EIS. Public and agency engagement for the EIS and other community engagement is included in Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS. Potential effects to socioeconomics are discussed in Section 3.6 of the Draft EIS.	General Support, Socioeconomics
2	Nicholas Franklin	HHSC-KR	2	I support ongoing leases for the joint strategic defense as currently established.	The Proposed Action is described in Chapter 2 of the Draft EIS, and	Traffic

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				I would encourage contributing further federal funds to repair roadways up Kokee, even past the NASA facility to Kalalau lookout, in a jesture to the community and tourist use.	includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Public road improvement projects are outside the scope of this EIS and NASA or Navy's jurisdiction.	
2	Nicholas Franklin	HHSC-KR	3	I also strongly support expanding active cell service across the Kokee State Park for safety and convenience. Fantastic that the entrance to your NASA facility has excellent service, but at my cabin lease or on most trails there is null...and as a well known local service oasis may be counterproductive to have frequent vehicles (I'm guilty) trolling around your entranceway just to check messages...or make emergency calls.	Comment noted; however, private utility updates and/or modifications are not within the scope of this EIS or NASA or Navy's jurisdiction. The EIS team suggests contacting a local cell service provider to expand services.	Utilities
2	Nicholas Franklin	HHSC-KR	4	In example: that unmarked road to the Makaha Ridge is pristine. Perhaps expanding that underlying situational readiness to the entire Kokee roadway is both generous and prudent. The number of civilians at any time in the Kokee Park would more reliably disperse up or down mountain in the event of enhanced military readiness with well maintained roadways.	The action alternatives described in Section 2.3 (Alternatives Carried Forward for Detailed Analysis) of the Draft EIS include securing new real estate agreements and does not include additional development or roadway improvements. Potential effects to transportation networks are described in Section 3.11 of the Draft EIS.	Traffic
3	Bill Zimmerman	n/a	1	This should be a ''no brainer'' for anyone living on any Hawaii island:	On behalf of the Navy and NASA, the EIS team thanks you for your	General Support

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				With the very clear and continuing challenges by various Nations, SO similar to previous to the Pearl Harbor debacle, anyone, especially anyone on any Hawaii Island MUST recognize that those islands will be first and foremost in any and every aggressions by those bad actors wanting to harm USA; to think otherwise is to IGNORE the CLEAR History of the wonderful islands of Hawaii, as well as many other islands of the vast Pacific... Love and Peace to all y'all,,, VintageVNvet, now certifiably an antique far shore, but still remembering and still loving ALL the folx who were SO great and gracious to me in the Hawaiian places when I was there;;;	comment and appreciates your participation. Information about Navy and NASA's mission and use of these lands is included in Section 1.3 (Background) of the Draft EIS. Additionally, Section 1.7.5 (Ongoing Community Coordination) in the Draft EIS identifies ongoing community outreach.	
4	Richard Spotts	n/a	1	I appreciate this opportunity to provide scoping comments on this significant proposed action. At the outset, I believe that this and other federal planning and NEPA analysis processes should actively consider how the proposed action and alternatives may add to or help solve the climate and extinction crises. These overlapping crises pose an existential threat to humanity and the health of the biosphere. On the climate crisis, please review the attached IPPC report. This report summarizes the overwhelming international scientific consensus on the severity of the climate crisis and the urgent need to phase out the use and development of fossil fuels. On the extinction crisis, there are an	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation and provided attachment. Predictable environmental trends can also be found at the beginning of each resource section in Chapter 3. The EA prepared for the Joint Forces Solar Power Generation Project at PMRF is referenced in the Draft EIS. Also, please refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) of the Draft EIS in regard to renewable and clean energy projects ongoing and slated for future development. As described in Sections 1.3	Biological Resources

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				increasing number of scientific reports on the rapid loss of biological diversity and how this loss undermines the stability, resilience, and productivity of the ecosystems upon which life on Earth depends.	(Background) and 3.4 (Biological Resources) of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the Project Area are focused on mitigating risk to these resources and the base's military mission.	
4	Richard Spotts	n/a	2	Overall, this compelling science demonstrates the urgent need for bold and innovative solutions. Questions arise like: how can fossil fuel use be reduced and replaced by clean, renewable energy sources? How can any destruction, degradation, or fragmentation of wildlife habitat be avoided, reduced, or successfully mitigated? How could construction materials be sourced from sustainable producers and practices? How could the use of any toxic chemicals be replaced by safer alternatives? How could gains in energy and water conservation be achieved? How could any harmful invasive plants be prevented, controlled, reduced, or eradicated? Please consider these questions in moving forward.	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Section 3.4 (Biological Resources) identifies potential effects from invasive species from the Proposed Action. This section also describes how PMRF works to reduce and eliminate the introduction or spread of invasive species including management strategies in the publicly available Integrated Natural Resource Management Plan (INRMP) and other plans and initiatives.	Biological Resources
4	Richard Spotts	n/a	3	On this specific proposed action, I am concerned about the many ESA listed plant and animal species in Hawaii and how this proposed action and alternatives	Section 3.4 (Biological Resources) of the Draft EIS includes a list of the ESA listed species present or with potential habitat in the Project Area.	Biological Resources

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				may affect them. Hawaii is an epicenter for the extinction crisis. I hope this NEPA analysis will help identify the least damaging but feasible alternative to best advance the protection and recovery of those species. I also hope that any energy used will come from clean, renewable sources. Health is the ultimate wealth, and we all need a healthy environment. Thank you very much for your kind consideration of my comments and the attachment.	This is also described in Sections 2.5 (Best Management Practices) and 3.4 (Biological Resources) of the Draft EIS. Also, PMRF has an INRMP that is updated regularly and implements a comprehensive plan for natural resource conservation and management. The INRMP can be found on the PMRF-KPGO EIS website at www.pmrf-kpgo-eis.com. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-3 discusses the Navy's commitment to provide the public with annual wildlife summaries, including status updates and data reports and research studies.	
5	Chong Family	n/a	1	To whom it may concern, Like to request information on the EIS being presented for the Pacific Missile Range Facility on Kauai? Thank-you, R Chong	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The project's website with information about the PMRF KPGO EIS process was sent on May 15, 2024. Information can also be found on the website, www.pmrf-kpgo-eis.com.	EIS Process
6	Valerie Weiss	N/A	1	Please tally my vote as NO on extending the lease at PMRF. This state has already seen the results of	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your	General Opposition, Existing

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				toxic pollution by the military. The Navy has had too much leeway in their denying that they are ever to blame. At PMRF spilled PFAS are in our ocean. There are likely many other toxics spilled or dumped that we usually do not get informed on. And stop dumping Naval ships into our ocean claiming they will be reefs. They are junk and do not belong in our waters for any reason including RIMPAC exercises.	participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS. The Draft EIS also includes a discussion on the Navy's adherence to applicable state and federal regulations regarding the disposal of hazardous or toxic wastes in Section 3.12 (Hazardous Materials and Waste). Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease (Appendix C), negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	Operations, Area of Analysis, Hazardous Materials and Waste, Water Resources
7	Naadia Puri	Navy Region	1	Sir/Ma'am, My name is LT Naadia Puri and I work at Navy Region Pearl Harbor, Oahu. I am unable to make these meetings in person on island, is there a link I can attend to listen to the presentation? V/R, LT Naadia Puri	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Unfortunately, the meetings were in-person; however, a scoping report is included in the Draft EIS as Appendix J.	EIS Process

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8	Reef Migita	Dept of Health, Clean Water Branch	1	Ms. Kerry Wells, The Department of Health (DOH) Clean Water Branch (CWB) has received the request for comment regarding the U.S. Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA) Environmental Impact Statement (EIS). As the EIS will evaluate the potential environmental consequences of the Navy's proposal to retain the use of 8,348 acres of State lands presently utilized pursuant to leases and easements on Kaua'i, Hawai'i, for operational continuity and sustainment at the Pacific Missile Range Facility (PMRF), the CWB offers the following comments:	On behalf of the Navy and NASA, the EIS team thanks the Hawaiʻi Department of Health, Clean Water Branch for these comments and appreciates their participation.	EIS Process
8	Reef Migita	Dept of Health, Clean Water Branch	2	The DOH and County of Kaua'i has settled with Nā Kia'a Kai and Surfrider Foundation to issue one or more draft National Pollutant Discharge Elimination System (NPDES) permits for all outfalls of the Mānā Plain Drainage Ditch System, including but not limited to the outfalls of Kīkīaola Harbor Drain, Kawaiʻele Outfall, Nohili Outfall, First Ditch, Second Ditch, and Cox Drain. (The attached settlement agreement substantively represents what the parties agreed to and have filed with the US District Court for the District of Hawaii.) The Kawaiʻele Outfall exists within PMRF's Installation Boundary, as shown on Enclosure (2) – Project Location Map (See 20240510.NAV PAC MISSLE FAC EIS.pdf) and the Navy currently leases the land on the Mānā Plain from the Department of	As described in Section 3.7.1 (Affected Environment) of the Draft EIS, Agribusiness Development Corporation (ADC) has applied for a National Pollutant Discharge Elimination System (NPDES) permit for all outfalls of the Mānā Plain Drainage Ditch System, including but not limited to the outfalls of Kīkīaola Harbor Drain, Kawaiʻele Outfall, Nohili Outfall, First Ditch, Second Ditch, and Cox Drain. ADC would ensure compliance with any permits issued. Kawaiʻele Outfall, where Kinikini Ditch connects to the open coastal waters abutting the PMRF, and Nohili Outfall, will require coordination from the Navy for compliance with NPDES permit requirements. ADC, Department of	Water Resources

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				Land and Natural Resources (DLNR) under General Lease No. S-3852 and is responsible for the operation and maintenance of the canals, including the pumps and associated infrastructure. Hence, it appears that the Navy is responsible for discharges from this outfall. The Kawaiʻele Outfall is where Kinikini Ditch connects to the open coastal waters abutting the PMRF. In addition, there is another possible outfall (i.e., Nohili Outfall) from within PMRF's jurisdiction and leased area contributing to the discharge that could also be impacted. The Order for Summary Judgement and Dismissal between Nā Kiaʻa Kai and Surfrider Foundation, and the State of Hawaii, Agribusiness Development Corporation (ADC), see attached, may affect the Navy even if the Navy was not subject to the case. Consideration should be given to the situation where DLNR land is no longer managed by ADC. What is ADC's current role regarding the subject land and when does this role expire? If ADC is no longer involved with this land, is it the Navy's intent to apply for NPDES permit coverage for the discharges subject to the Order? Sincerely, Reef Migita	Land and Natural Resources (DLNR), and the Navy are determining a long-term strategy for these outfalls to ensure compliance should current roles change. The NPDES permit has not yet been issued for these outfalls, once the permit requirements are known, this strategy can be better solidified.	
9	Jordan Lemke	Wailua Homesteads Resident	1	Mahalo for allowing the opportunity to provide comments on the proposed use by the Navy and NASA of 8,371 acres on Kauaʻi.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. As described in Section	General Opposition, Socioeconomics

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				Upon further review of the Environmental Impact Statement Preparation Notice, I offer the following comments; We do not have enough ʻāina to be awarding nearly 8,500 acres to the Navy and NASA. The lease rate is abhorrent and if the real estate action is approved, should come at a much higher price. Lessons learned from Red Hill, Kahoʻolawe, and Mākua Valley should not be ignored when considering this "real estate action".	3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at current fair market value,-and would be determined through negotiations with Hawaiʻi Board of Land and Natural Resources (BLNR). We value your concerns related to other military installations. However, impacts at Red Hill, Kahoʻolawe, and Mākua Valley are outside the scope of this EIS. The EIS team suggests contacting government officials to voice concerns regarding other military real estate agreements.	
9	Jordan Lemke	Wailua Homesteads Resident	2	The continued military presence in Hawaiʻi does not at all offer a sense of protection to residents. Ask anyone living in Aiea on Oʻahu if they feel safer knowing the military is storing jet fuel in their puʻu's. Ask residents of Kauaʻi if they feel safer knowing ordnance's are being stored in our pali's.	The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). Section 2.5 (Best Management Practices) of the Draft EIS includes a list of the current best management practices, plans, permit requirements, management strategies, and standard operating procedures followed by the Navy on leaseholds and easement lands. Additionally, Section 3.7 of the Draft EIS discusses potential effects to water resources, Section 3.9 discusses potential effects to public health and safety (including that ordnance is stored in required	Hazardous Materials and Waste, Public Health and Safety

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					devices with proper ventilation, marking and placarding, and safety arcs have been implemented for public health and safety). This section also includes a discussion on the use of standard operating procedures that are in place to prevent unintentional release of fuels or oil. An overview of the Navy's procedures that would be followed in the event of an oil spill per the PMRF Oil and Hazardous Substance Spill Contingency Plan can be found in Section 3.9 (Public Health and Safety) of the Draft EIS. The Plan outlines procedures to be followed in the event of a spill (in flow chart form), and is available on the PMRF KPGO EIS website, www.pmrf-kpgo-eis.com. Section 3.12 discusses potential effects from hazardous materials and waste. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS.	
9	Jordan Lemke	Wailua Homesteads Resident	3	Section 1.3.3 states - On Kauaʻi, the Navy is the largest high-tech employer and third largest overall employer. It employs approximately 900 military and civilian personnel and contributes approximately	We value your concerns related to other military installations. However, impacts at Red Hill, Kahoʻolawe, and Mākua Valley and military involvement at the Maui wildfires	General opposition, Socioeconomics

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				$150 million annually in salary, contract goods, and services to the local economy. Moreover, as described in Section 1.3.6, Environmental Management and Stewardship, the Navy actively manages the natural and cultural resources at PMRF for the leased and easement lands. The poor choice of Hawaiʻi leaders to continue to rely on tourism and the military complex as its main source of income is not something to ride home about. The COVID-19 pandemic proved the tourism point in spades. The deadly fires in Maui on August 8 left residents wondering what exactly it was that the military did to support that situation. The National Guard had to be flown in before any real aid was offered despite having thousands of military personnel already here. Again, Red Hill, Kahoʻolawe, and Mākua Valley are all prime examples of how the military are not good ʻāina stewards.	are outside the jurisdiction and scope of this EIS. The EIS team suggests contacting government officials to voice concerns regarding other military real estate agreements. PMRF also demonstrates community outreach efforts by actively engaging with various stakeholders as discussed in Section 1.7.5. As discussed in more detail in Sections 1.3.6 (Environmental Management and Stewardship) and Section 3.4 (Biological Resources) in the Draft EIS, the Navy's efforts to protect natural resources at PMRF include the involvement of the Department of Defense's Readiness and Environmental Protection Integration (REPI) Program which facilitates long-term, collaborative partnerships that preserve important habitats and natural resources, support sustainable and productive land uses, and promote resilient natural and working lands and waters for installations and their surrounding communities.	
9	Jordan Lemke	Wailua Homesteads Resident	4	Section 1.4 states - By ensuring continued Navy and NASA operations on Kauaʻi, the real estate action would also preserve local jobs and income for the residents of Kauaʻi, financially contribute to the overall economic wellbeing of Kauaʻi, and maintain continued conservation	Section 3.6 (Socioeconomics) of the Draft EIS describes potential effects to socioeconomics from the Proposed Action.	Socioeconomics

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				management of natural and cultural resources on State lands at no cost to the State of Hawaiʻi. How does this real estate action contribute to the overall economic well-being of Kauaʻi? I wonder if residents really feel as though their well-being is improved by the over-presence of the military in the pae ʻāina?		
9	Jordan Lemke	Wailua Homesteads Resident	5	Lastly, the most appropriate stewards of ʻāina are the ones who have generational ties to this ʻāina. Not the Navy, nor NASA. As modern-day colonizers of these islands, we as haoles need to recognize that the appropriate people to be informing us on how to steward ʻāina are the Kānaka ʻŌiwi. Rather than the Navy or NASA being the leaseholders, why not designate these lands as conservation lands and ensure perpetual public access? It seems aloof and albeit arrogant, for the Navy and NASA to be under the impression they are the highest and best landowners for these spaces.	Comment noted. The action alternatives considered in this EIS and the selection of these alternatives is described in Chapter 2 (Proposed Action and Alternatives) of the Draft EIS. The Navy and NASA recognize the history of land use in the Project Area as described in Sections 1.3 (Background) and 3.5 (Land Use and Access) in the Draft EIS. Analysis of potential impacts from the No Action Alternative is included in the Draft EIS consistent with legal and regulatory requirements. This alternative is described in Chapter 2 and analyzed in Chapter 3 of the Draft EIS.	EIS Process, Land Use and Access, Alternatives
9	Jordan Lemke	Wailua Homesteads Resident	6	Mahalo for allowing the public to comment. It would be a shock to me if this real estate action did not get approved as the corruption in this state, and especially Kauaʻi county is rampant. But know, the residents are watching and our patience is running very thin with the status quo.	The EIS has been prepared consistent with the U.S. and State of Hawaiʻi's legal and regulatory framework. The Proposed Action and alternatives are described in Chapter 2 (Proposed Action and Alternatives) of the Draft EIS.	General Opposition

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				Jordan Loudon, Wailua Homesteads Resident		
10	Inette Miller	The Return Voyage	1	No action alternative.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	General Opposition
11	Iokepa Imaikalani	The Return Voyage	1	No action alternative.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all	General Opposition

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					infrastructure from the leaseholds and easement lands.	
12	Timothy Chee	DLNR, Engineering Division	1	We have no comments.	On behalf of the Navy and NASA, the EIS team appreciates your participation.	No Comment
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	1	Thank you for the notice of the Pacific Range Missile Facility (PMRF) and the Kōke'e Park Geophysical Observatory (KPGO) Environmental Impact Statement (EIS) scoping process. The Surfrider Foundation is a national coastal environmental organization. The Missile Range Facility is sited on the coast of Kauai. PMRF is far more than a missile range. PMRF hosts submarine training, experiments with ocean sonar, both active and passive. PMRF has also been known to have military beach landing experiments and practice during Rim of the Pacific (RIMPAC) War "Games." PMRF has an airport and has been known to have experimental aircraft testing. There have been rumors of torpedo testing that has harmed local whales.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Section 1.3 (Background) of the Draft EIS describes the Navy and NASA's use of the state lands in the area of analysis. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The scope of analysis is described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS and is limited to areas of leaseholds and easements lands where Navy and NASA conduct ongoing activities.	Existing Operations, Biological Resources, Area of Analysis
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	2	Our first comment is that honest EIS scoping is impossible to do because everything done at PMRF is closed off and classified. The public has no idea of the dangers they might face from PMRF	Comment noted. Effects from ongoing PMRF activities are publicly available via the 2018 Hawaii-Southern California Training and Testing (HSTT) Final EIS/Overseas EIS	Existing Operations

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				activities and experiments. The EIS process should be transparent and inclusive, allowing for meaningful public participation. It is vital that the community is kept informed and has ample opportunity to provide input throughout the process.	(OEIS). The 2018 HSST EIS can be found on the PMRF-KPGO Draft EIS website at www.pmrf-kpgo-eis.com. The EIS has been prepared consistent with the U.S. and State of Hawaiʻi's environmental regulatory framework, which includes public participation as described in Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS.	
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	3	Our second comment is recurring. The Navy writes its own EIS and then the Navy certifies its own EIS. From our point of view, that is unethical and unfair and not in the spirit of the National Environmental Protection Act. We request an independent body prepare the DRAFT EIS.	As described in Section 1.1 (Project Introduction and Overview) of the Draft EIS, the EIS has been prepared by a third-party contractor consistent with Hawaiʻi Environmental Policy Act (HEPA) and NEPA laws and regulations. Board of Land and Natural Resources (BLNR), as the accepting authority (under Hawaiʻi Administrative Rules [HAR] Section 11-200.1-28), will evaluate whether the applicant-prepared EIS fulfills the intent of Hawaiʻi Revised Statutes (HRS) Chapter 343 and will consider HRS Title 12, Chapter 171 (Hawaiʻi's law governing management and disposition of public lands).	EIS Process
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	4	Further scoping comments An environmental assessment of the natural lands around PMRF should be done and compared to the last EIS. Have the coastal lands and wetlands been enhanced or degraded? Have endangered	In lieu of an environmental assessment, it was determined an EIS was the appropriate level of environmental review. As described in Section 3.12 (Hazardous Materials and Waste) of	Area of Analysis, Biological Resources, Hazardous Materials and Waste

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				species increased or decreased from the last EIS? The EIS should address the potential impacts on local flora and fauna, especially endangered species and their habitats. The analysis should include the effects of noise, light pollution, and any chemical byproducts that may affect the ecosystem. Please update and compare the Environmental Baseline Survey for the lowland area that was done over 20 years ago and complete a new Environmental Baseline Survey for the mauka (inland) area.	the Draft EIS, chemical byproducts with the potential to be hazardous are managed in compliance with several environmental regulations. A list of these regulations can be found in Appendix E. Section 3.4 (Biological Resources) describes potential effects from the Proposed Action (including noise and light pollution), and these are supported from baseline flora and fauna studies conducted in support of this EIS. Section 3.7 (Water Resources) includes a description of the existing condition of wetlands in the Project Area and also describes potential effects from the Proposed Action. A wetland delineation was conducted in support of this EIS and can be found in Appendix N.	
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	5	The EIS should assess how climate change will affect the facility's operations and how the facility might contribute to climate change. This includes evaluating greenhouse gas emissions and potential increases in sea levels. That should include emissions from small boats, submarines, tow motors, missiles, airplanes and helicopters.	Although as described in Chapter 2 of the Draft EIS, the Proposed Action does not include additional activities or development. Potential effects from the Proposed Action to natural resources are discussed in Sections 3.4 (Biological Resources) and 3.7 (Water Resources), and potential effects from the Proposed Action to air quality and greenhouse gases are discussed in Section 3.10 (Air Quality and Greenhouse Gases). A map showing the 3.2-foot sea level rise scenario is included in Section	Air Quality and Greenhouse Gases, Sea Level Rise

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					3.1.2 of the Draft EIS, and predictable environmental trends (including sea level rise) are discussed in each resource section. The Environmental Assessment (EA) prepared for the Joint Forces Solar Power Generation Project at PMRF is referenced in the Draft EIS. Also, please refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) to read about ongoing renewable and clean energy projects and projects slated for future development at and within the vicinity of PMRF. As described in Sections 1.3 (Background) and 3.4 (Biological Resources) of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the Project Area are focused on mitigating risk to these resources and the base's military mission. Each resource chapter in the EIS contains a table summarizing predictable environmental trends.	
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	6	The water table at PMRF should be evaluated for military toxins. Groundwater contaminants were found in the past. Also, there had been a flame-retardant spill in the past. This is particularly important since there is a commercial shrimp farm adjacent to PMRF. Is the Shrimp Farm water contaminated?	Existing conditions and potential effects from the Proposed Action to water resources are described in Section 3.7 (Water Resources) of the Draft EIS. Additionally, existing conditions and potential effects from hazardous materials and waste is	Water Resources, Hazardous Materials and Waste, Public Health and Safety, Land Use and Access,

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					described in Section 3.12 of the Draft EIS.	Cumulative Effects
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	7	PMRF has facilities from the World War II era. Are there any impacts? What is the condition of the fuel tanks at PMRF? When will they be replaced? How do they differ from Red Hill, Oahu? Please evaluate the impacts of explosive ordinance stored at the leased facilities at PMRF. Please evaluate the danger to the public of trucks carrying ordinance, jet fuel, missiles and military weapons on Kaua'i highways. How is the solid waste managed? How is sewage managed?	Management of solid waste and the potential effects from hazardous materials, hazardous waste, and solid waste from the Proposed Action are described in Section 3.12 of the Draft EIS. Potential effects to public health and safety are described in Section 3.9, and potential effects to transportation are described in Section 3.11 of the Draft EIS.	Existing Operations, Public Health and Safety, Hazardous Materials and Waste, Transportation
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	8	Please look at the electromagnetic radiation radar effects on the soldiers, Koke'e residents and on local bird wildlife. Does the radar affect civilian weather use or boating navigation?	Potential effects to public health and safety in the Project Area are described in Section 3.9 of the Draft EIS. Potential effects to biological resources (wildlife) in the Project Area are described in Section 3.4 of the Draft EIS.	Existing Operations, Public Health and Safety, Hazardous Materials and Waste, Biological Resources
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	9	The land around PMRF was formerly agricultural, much of it still in agriculture. What are the Navy's intentions and what are the impacts? PMRF leased land is in an extreme fire danger area. Are there mitigations they could do to lessen the danger?	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development.	Land Use and Access, Public Health and Safety, Biological Resources

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					Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities are described in Cumulative Impact Analysis (Chapter 4 of the Draft EIS). A history of land use in the project area is included in Section 1.3 (Background) and Section 3.5 (Land Use and Access). As described in Section 3.9 (Public Health and Safety) of the Draft EIS, PMRF ensures that launch areas are maintained free of flammable vegetation and therefore have minimal fire potential, non-native areas are regularly mowed, areas adjacent to pads are pre-soaked with water prior to a launch, and fire and emergency service crews are present at every launch.	
13	Rob Brower	Surfrider Foundation, Kaua'i Chapter	10	It is crucial that the EIS explores alternative strategies that could minimize environmental and social impacts. Additionally, the document should outline clear mitigation measures to address any potential adverse effects. Rob Brower, Chair Surfrider Foundation, Kaua'i Chapter	Socioeconomics is addressed in the Draft EIS in Section 3.6. Potential mitigation and enhanced management measures (EMMs) from identified effects from the Proposed Action are identified throughout Chapter 3 and summarized in Chapter 5 (Mitigation	Socioeconomics

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					and Enhanced Management Measures) of the Draft EIS.	
14	Charles King	n/a	1	I am in full support of renewing all the leases to the Navy at PMRF. I have been in business on Kauai for 50 years and have always found them to be good neighbors. I remember, in particular, their support of our citizens and local government during Hurricane Iniki.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Thank you for recognizing services provided by PMRF during Hurricane Iniki. Potential effects to public health and safety are discussed in Section 3.9 of the Draft EIS.	General Support for Navy
15	David Phillips	n/a	1	How much does the Navy pay the State total to lease the lands?	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Section 3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at current fair market value, and would be determined through negotiations with Board of Land and Natural Resources (BLNR). According to the real estate agreements (Appendix C), Navy paid $1 to the State of Hawai‘i for their leases. NASA pays the State of Hawai‘i $600/year for the leases.	Socioeconomics
16	Marjorie Gifford	n/a	1	Land use: Because of the high demand from both residents and tourists for the use of our beaches, it is almost impossible to get a parking place with beach access espedically on Saturdays and Sundays. If pmrf did not occupy and obstruct so much of our beachland, it would provide greater access to our residents. It is too time consuming to try to obtain a beach permit	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using	General Opposition, Land Use and Access, Transportation

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				at pmrf AND the choice beach is not available except on one day at the beginning of July.	the main gate and affords unrestricted travel and access to Majors Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-2 discusses the streamlining access for subsistence, habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Contact the PMRF Public Affairs Office for more information: (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.	
16	Marjorie Gifford	n/a	2	LAND USE: Further, we need flat lands available on which to build housing for our low income people. Our workers are leaving the island because they cannot	As described in Section 1.3.5 (Navy and NASA-use of state lands), the flat lands adjacent to PMRF (Mānā Plain) are restrictive use agriculture	General Opposition, Land Use and Access

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				find housing or rentals. Leaving the pmrf areas available for the county to develop for low income housing would be a boon to our county. LAND USE: This land belongs to the Sovereign Hawaiian Kingdom and should be returned to it.	easement lands. These areas are used as safety buffer zones around the Navy's activities on fee simple land. In addition to agricultural uses, these lands are available for conservation, open space, and recreational uses. The Proposed Action is described in Chapter 2 of the Draft EIS and does not include housing. A history of land use is included in Sections 1.3 (Background), 3.2 (Archaeological and Architectural Resources), and 3.5 (Land Use and Access). The EIS has been prepared consistent with the U.S. and State of Hawai‘i’s environmental regulatory framework.	
17	Dylan Ramos	n/a	1	The Navy and NASA should stop all PMRF operations and consider the serious concerns regarding cultural resources, land use, environmental justice, national defense, and more that have been raised for years by Native Hawaiian organizations, environmental groups, and grassroots, community-based movements.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. We value your concerns in regard to Navy and NASA operations. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS. Potential impacts to cultural resources and land use from the Proposed Action can be found in Sections 3.2 (Archaeological and Architectural Resources), 3.3	General Opposition, Archaeological and Architectural Resources, Cultural Practices

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					(Cultural Practices), and 3.5 (Land Use and Access) of the Draft EIS. Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix. Analysis of potential impacts from the No Action Alternative is included in the Draft EIS consistent with regulatory requirements. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
18	Terry Lilley	n/a	1	I am the marine biologist from Hanalei Kauai that documented the Navy killing the coral reefs along Kauai north shore with their microwave radar towers and electromagnetic discharge into the sea from submarines from 2012 to 2014. Navy produced radiation breaks down the calcium carbonate structure of the coral killing the reef. I have all the science proving this and I presented that to PMRF commander and legal team in 2015. The Navy needs to include in their EIS the	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Chapters 1 and 2 of the Draft EIS, the scope of the EIS includes land-based leaseholds and easement lands; therefore, marine resources, such as sea turtles and whales, are not covered in the scope of this EIS. Potential effects from the Proposed Action to marine resources,	Existing Operations, Hazardous Materials and Waste, Public Health and Safety, Biological Resources

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				effects of microwave radar towers, electromagnetic, plasma energy weapons and other forms of radiation used for surveillance underwater. By ignoring the effects of these energy sources the Navy would be violating the US Endangered Species Act as they operate in the habitat of the protected sea turtles, monk seals and endangered seabirds. Here is a movie I did on the subject in 2014 that I supplied to Congress. We have a great deal of new science done on the subject now from marine corrosion test to "skin effect" testing. https://www.youtube.com/watch?v=YwTElEv5OX4&authuser=0	including the endangered monk seal and sea turtle that utilize the terrestrial region of influence (ROI), are described in Section 3.4 (Biological Resources) of the Draft EIS. Potential effects to public health and safety are discussed in Section 3.9 of the Draft EIS.	
19	Anonymous	n/a	1	The navy has threatened the very life that sustains the citizens it's supposed to protect by poisoning the water and damaging our ecosystem. End this unnecessary suffering now so our planet and people have a chance	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. We value your concerns in regard to Navy's operations at PMRF. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS and Section 3.7 (Water Resources) of the Draft EIS. Chapter 5 (Mitigation and Enhanced Management Measures) of the Draft EIS describes actions the Navy and NASA are currently taking to avoid and minimize impacts from the	General Opposition to Navy, Water Resources, Biological Resources

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					Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina.	
20	Eric Nguyen	n/a	1	Allowing the Navy to construct facilities in Koke'e would be introducing an inevitable environmental disaster. The Navy has a long history of showing zero competency and an unacceptable lack of transparency with the public in terms of being able to manage its own facilities and Hawaii's cultural & natural resources. The latest of many examples include Red Hill, Kamokala, and the ongoing contamination of lands at Joint Base Pearl Harbor. The effects of any sort of mishap would be too costly of a burden for the County of Kauai and State of Hawaii to handle. Installations on the island of Kauai already disrupt natural wildlife (i.e. PMRF and nesting birds).	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. We value your concerns in regard to Navy's operations at PMRF. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS. As described in Section 3.4 (Biological Resources) and Section 3.2 (Archaeological and Architectural Resources) of the Draft EIS, PMRF maintains an up-to-date INRMP Integrated Natural Resources Management Plan (INRMP) and Integrated Cultural Resources Management Plan (ICRMP). The INRMP serves as a repository for natural resource information, provides guidance on how PMRF is to meet compliance requirements, sets management goals, required actions, and obtain resources	General Opposition to Navy, Water Resources, Socioeconomics, Biological Resources, Cultural Practices, Archaeological and Architectural Resources

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					necessary to protect and manage the installation's natural resources. The ICRMP is a plan that provides coordinated management of cultural resources and PMRF's mission with stewardship on PMRF in a responsible manner, consistent with the entire body of existing federal laws and regulations. As described in Section 3.4, and as presented in the INRMP, mitigation measures are in place for wildlife protection and management on PMRF. These include searching for Migratory Bird Treaty Act (MBTA) protected birds before and during construction activities, surveying beaches for sea turtle nesting activity or nests before amphibious landings and beach activities, reserving activities requiring night lighting for outside of seabird breeding and fallout season, and by using red and shielded light when possible at PMRF. PMRF also demonstrates community outreach efforts by actively engaging with various stakeholders as discussed in Section 1.7.5 of the Draft EIS. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in	

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					Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Potential impacts to archaeological and biological resources from the Proposed Action are described in Sections 3.2 and 3.4, respectively, in the Draft EIS. We value your concerns related to other military installations. However, impacts at Red Hill and Joint Base Pearl Harbor-Hickam are outside the scope of this EIS.	
20	Eric Nguyen	n/a	2	The impacts of equipment placed atop Koke'e must be studied to exhaustion, to not only wildlife, but to native flora, effects on local hydrology and geology, and with serious consideration of input from the people of Hawaii. Koke'e must be treated as a vital natural resource and preserved for the current generation as well as future generations. No more military development!	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Potential effects from military equipment to wildlife at Koke‘e from the Proposed Action are discussed in Section 3.4 (Biological Resources) of the Draft EIS. Potential impacts from the Proposed Action on hydrology and geology are discussed in Section 3.7 (Water Resources) of the Draft EIS. Any future development by Navy and NASA are not in the scope of this EIS and would be subject to	General Opposition to Navy, Biological Resources, Water Resources

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					additional environmental review (Hawai‘i Environmental Policy Act [HEPA] and/or National Environmental Policy Act [NEPA]).	
21	Anonymous	Kaua'i Historical Society	1	Aloha, I’m a resident of Kaua’i, born and raised, and I am very interested in the results of the EIS and the overall process of the DOD’s request to renew their lease. As an involved member of our West Side community, I have various concerns. I hope this report can be transparent about the following: -within the current plot of 8000+ acres, what kind of cultural, Hawaiian sites are there? What kind of care and protection is designated in those spaces. - how much live ammunition is tested on this property, what is the process of clean up after testing? - what kind of chemicals do these heavy metals/materials leave behind in the groun? Does it have any effect on nearby water sources? - What kind of guidelines are in places to protect areas of resource like watersheds, streams, irrigation systems, etc.? - will the team overseeing the EIS work with a cultural practitioner or historian? I am against renewing the lease as it stands, and I believe reform on the current lease is essential to protecting Hawai’i and our people. I have signed up for the email list. Thank you for your time and I look forward to seeing how this unfolds.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Section 3.2 (Archaeological and Architectural Resources) of the Draft EIS describes the context in the region of influence (ROI) as well as the known archaeological and historic sites. Section 3.3 (Cultural Practices) of the Draft EIS includes a description of cultural practices within the ROI, including a list of individual cultural practitioners interviewed as part of preparing the Cultural Impact Assessment (CIA). Additional ongoing coordination conducted by PMRF is listed in Section 1.7.5 (Ongoing Community Coordination) in the Draft EIS. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development.	Cultural Practices, Archaeological and Architectural Resources, Public Health and Safety, Hazardous Materials and Waste, Water Resources, EIS Process

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					The proposed real estate agreement would be at current fair market value. As described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS, the scope of analysis is limited to the Navy and NASA's activities on leaseholds and easement lands. Potential effects from the Proposed Action are described in Chapter 3 of the Draft EIS, including potential effects to Hazardous Materials and Waste (Section 3.12), Public Health and Safety (Section 3.9), and Water Resources (Section 3.7). Protection measures and safeguards are discussed in these sections, and also in Section 2.5 (Best Management Practices) of the Draft EIS. Your group's contact information has been added to the mailing list.	
22	Sandra P. Quinsaat	Native Hawaiian Organization Na Hui O Kaneiolouma	1	Aloha mai, For the record, my name is Sandra Puanani Quinsaat, I am 70 years old, born and raised here on Kaua`i and thankful I can still live here. I am of Kanaka/Filipino/Caucasian decent. I received your correspondence referencing the above noted subject, mahalo for reaching out. I will not be able to attend your meetings and appreciate submitting my testimony in writing. Your proposed action is needed as the existing agreement for the State lands you occupy are set to expire. For this I'm sure	On behalf of the Navy and NASA, the EIS team thanks you for your participation and providing your comments in writing. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action	Land Use and Access, Proposed Action, Existing Operations

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				there will be negotiations with the State based on the outcome of the EIS. These facilities are currently in existence with significant justification in their practices and areas of potential affect established. I don't object to the continuance of your business as you are currently operating. Your transparency and collaboration within our Island communities are key. I do however, strongly object to further development of buildings and desecration of ground on the properties you currently occupy. Moreover, I object to any training practices that exercises munition artillery that will impact the land or marine life in anyway shape or form. I say this by learning from history's lessons. Government has used abused and walked away from all destruction by their hands. No more! Not here on Kaua'i or anywhere else in this State going forward. Why ruin what little we have left, we are not a continent, where do we go! We know of other South Pacific Islanders who now reside here in Hawaii because their island was destroyed by US Government and countless destruction already done here in our State. These events happened we know that, so why would we support any form of destruction to our lands.	alternative includes additional development. Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used. Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS, describes how PMRF regularly coordinates with a diverse array of individuals and organizations. This engagement ensures active and meaningful communication with community stakeholders, fostering collaboration and addressing local concerns effectively. Chapter 5 (Mitigation and Enhanced Management Measures) describes actions the Navy and NASA are currently taking to avoid and minimize effects from the Proposed Action and continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the 'āina. Although it is out of scope for this EIS, previous National Environmental Policy Act (NEPA) analysis has been conducted that covers ongoing	

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					testing and training activities on fee simple land adjacent to the state-owned parcels (see Section 1.3.3 of Draft EIS) and can be found on the PMRF-KPGO EIS website at www.pmrf-kpgo-eis.com.	
22	Sandra P. Quinsaat	Native Hawaiian Organization Na Hui O Kaneiolouma	2	The State of Hawaii has laws in place to protect the land and its resources, I Pray they understand their responsibility to the Native Hawaiian/Kanaka as appointed stewards for the the people and make decisions based on Hawaii Revised Status. With the lack thereof being Hawaiian Lands and Resources, Military presence here in Hawaii must be regulated. I further pray that all contracted agreements between PMRF and the State are done with the best interest of Kaua`i residents at heart. Mahalo for your understanding of my testimony Kind regards, Sandra P. Quinsaat, Native Hawaiian Organization, State of Hawai'i: Kaua'i/Ni'ihau Island Burial Council Commissioner/Chair	The Navy and NASA understand the public's awareness and concern regarding military actions and their ability to be good stewards of the land. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS.	Cultural Practices, Land Use
23	Hanna Hodak	n/a	1	The Pacific Missile Range Facility Barking Sands should not be in use or be furthered as it is harmful to local land, voices, and culture. There should be a Demilitarization to the parts of Hawai'i that can still be kept safe and culturally sound.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As discussed in Sections 3.4 (Biological Resources) and 3.2 (Archaeological and Architectural Resources) of the Draft EIS, PMRF would continue to be stewards of the land through the use of their Integrated Natural	General Opposition to Navy, Land Use and Access, Cultural Practices

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					Resources Management Plan (INRMP) and Integrated Cultural Resources Management Plan (ICRMP). The INRMP and ICRMP serve as repositories for natural and cultural resource information, provide guidance on how PMRF is to meet compliance requirements, and set management goals and required actions. The 2023 INRMP can be found online at www.pmrf-kpgo-eis.com. Sections 3.2 (Archaeological and Architectural Resources, 3.3 (Cultural Practices), and 3.4 (Biological Resources) of the Draft EIS include analysis of potential effects to these resources from the Proposed Action.	
24	Jason Yotsuda	n/a	1	Hi, I just wanted to put my 2 cents in about the continuation of PMRF using the area. In the past, we were allowed to access the beaches for fishing, but since 911 that has been taken away. The area is prime for fishing and beach going. I support PMRF, but not at the cost of restricted use of the beach area. Mahalo, Jason	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted travel and access to Waiapuaʻa Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized	Land Use and Access, General Support

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					access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action would not change public access at PMRF. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-2 discusses the streamlining access for subsistence, habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Contact the PMRF Public Affairs Office for more information: (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.	
25	Joshua Hekekia	State of Hawaiʻi Office of Planning and Sustainable Development	1	Thank you for the opportunity to provide comments for the Environmental Impact Statement Preparation Notice (EISPN) on the Pacific Missile Range Facility and Kokeʻe Park Geophysical Observatory Real Estate Project. The notification request was received by our office via memo on May 13, 2024. It is our understanding that this real estate study involves two federal agencies. The U.S. Navy (USN) proposes to retain the use	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation.	EIS Process

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				of 8,348 acres of the subject parcel for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF). The National Aeronautic Space Administration (NASA) proposes to retain the use of 23 acres of the subject area in support of continued operations at Kōkeʻe Park Geophysical Observatory (KPGO). Both federal agencies have agreements with the State of Hawaiʻi. The Department of Land and Natural Resources (DLNR) has the fiscal responsibility to manage these real estate agreements land leases which are set to expire between 2027 and 2030. The Office of Planning and Sustainable Development (OPSD) has reviewed the submitted material and has the following comments to offer:		
25	Joshua Hekekia	State of Hawaiʻi Office of Planning and Sustainable Development	2	Issues of Programmatic Concern We acknowledge that the EISPN touches on issues that are of programmatic concern for OPSD and that will be addressed in the Draft Environmental Impact Statement (DEIS). These include State Land Use controls Hawaiʻi Revised Statutes (HRS) Chapter 205 (State Land Use Laws); HRS Chapter 226 (the Hawaiʻi State Planning Act); and as stated in Appendix B of the EISPN regulatory settings concerns that are related to the coastal environment such as Water Resources; Marine Biological Resources; and Geological Resources.	Comment noted.	Regulatory Setting, Water Resources

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25	Joshua Hekekia	State of Hawaiʻi Office of Planning and Sustainable Development	3	Coastal Zone Management Act (CZMA), Federal Consistency We note that Table 4-1, page 4-3 of the EISPN correctly identifies that this project may be subject to CZMA Federal Consistency based Title 15 Code of Federal Regulations (CFR) Part 930 Subpart C – Consistency for Federal Agencies. OPSD is the lead state agency with the authority to conduct CZMA federal consistency reviews. At your earliest convenience, please contact our office on the applicability of CZMA federal consistency.	The Navy and NASA will be coordinating with the State of Hawaiʻi Office of Planning and Sustainable Development, Planning Division under the Coastal Zone Management Act (CZMA) as described in Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS.	Consistency with Government Plans and Policies
25	Joshua Hekekia	State of Hawaiʻi Office of Planning and Sustainable Development	4	Hawaiʻi Coastal Zone Management (CZM) Program The CZM area is defined as "all lands of the State and the area extending seaward from the shoreline to the limit of the State's police power and management authority, including the U.S. territorial sea" under HRS § 205A-1. Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the determining agency is the DLNR Land Division, to assist in the decision-making process, the DEIS should include a discussion on the project's consistency with the policies of the Hawaiʻi CZM Program, HRS § 205A-2, as amended. Furthermore, the objectives and supporting policies of the Hawaiʻi CZM Program serve as the foundation of the	Effects to resources such as archaeology, land use, socioeconomics, and water are described in Sections 3.2 (Archaeology and Architectural Resources), 3.4 (Biological Resources), 3.5 (Land Use and Access), 3.6 (Socioeconomics), and 3.7 (Water Resources) of the Draft EIS. Chapter 5 (Mitigation and Enhanced Management Measures) of the Draft EIS describes actions the Navy and NASA are currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina.	Consistency with Government Plans and Policies

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				enforceable policies of the State of Hawaiʻi. Disclosure of impacts on CZM objectives and supporting policies will aid the State in determining impacts to central Oʻahu surface water resources as well as evaluate needed mitigation measures. For any questions, please contact Joshua Hekekia at (808) 587-2845 or by email to Joshua.K.Hekekia@hawaii.gov. If you wish to respond to this comment letter, please include DTS 202405131013NA in the subject line. Sincerely Mary Alice Evans, Director		
26	Thomas Clements	n/a	1	I support Alternative 1 and recommend this as the preferred alternative. This alternative provides for the continued use of these lands with minimal costs to administer. Alternative 2 potentially causes the State of Hawaii to purchase these lands when no longer needed by PMRF, creating cost for the Federal government at the front, and State government at the other end. If not purchased back by the state at that time, the lands could potentially be purchased by private entities and used in non-compatible ways. I see compatibility as the key issue for West Kauai. Currently, Hawaii's top three industries successfully function together. Tourism craft cross the waters of the Range to Napali; agriculture benefits from the API lease that relieves the pressure of commercial development interests, and PMRF continues as the #3	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation, and preference for Alternative 1. The potential effects from all alternatives are analyzed and compared in Chapter 3 of the Draft EIS. Also, a comparison of alternatives is included in Section 3.14 (Summary of Potential Environmental Impacts and Mitigation Measures) of the Draft EIS.	General Support, Socioeconomics, Land Use and Access

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				employer -- offering high tech careers while serving as the largest multi-environment instrumented range. Compatible tourism and agriculture activities ensure the viability of this national asset. High density housing and commercial development in the API leased lands create encroachment concerns that limit the effectiveness of PMRF. Therefore, these leased lands should continue without adjustments to preserve compatibility and viability for Hawaii's leading industries.		
27	Susan Wiener	n/a	1	Of the Action Alternatives, I definitely do NOT support Alternative 2 in which the Navy and NASA would purchase acreage on Kauai.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation, and notes your opposition to Alternative 2. The rationale for alternatives development is included in Chapter 2 of the Draft EIS. The potential effects from all alternatives are analyzed and compared in Chapter 3 of the Draft EIS. Also, a comparison of alternatives is included in Section 3.14 (Summary of Potential Environmental Impacts and Mitigation Measures) of the Draft EIS.	Alternatives
28	Lisa Grandinetti	n/a	1	Demilitarize the illegally occupied Kingdom of Hawaii!	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The EIS has been prepared consistent with the U.S. and State of Hawaiʻi's environmental	General Opposition to Navy

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					regulatory framework. The Proposed Action and alternatives are described in Chapter 2 of the Draft EIS.	
29	Don Wilson	USN, Retired	1	Ladies/Gentlemen, Please accept my strong endorsement for US Navy, NASA, Hawaii Air National Guard, FAA, and varied communications assets to continue to use HI State Koke'e Park land, to the benefit of the United States, Hawaii State, and Kauai County. In context, I am a former PMRF Commanding Officer, long since retired, and I have no personal or financial interest in this EIS. That said, given my professional knowledge of the facilities and operations located on the land, I believe these tenants should remain indefinitely – or until their use is no longer required. The US Navy is but one tenant, and Koke'e affords the greatest radar range available, given the height of Makaha Ridge. Being able to "see" great distances from a stable, fixed point assures greater safety, precise tracking, and coordination with other sensors to enhance training, and test and evaluation events. Rescinding authorization to use Koke'e would adversely impact Department of Defense – and other - missions, writ large. There is no viable substitute for this site, and the navy's presence is not just benign; the navy is a very good steward of the land. Indeed, navy assets are so integral to the	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation and recognition of the Navy and NASA's activities as valuable to the community and the land. Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS also describes the Navy's coordination at PMRF with a diverse array of individuals and organizations. This engagement ensures active and meaningful communication with community stakeholders, fostering collaboration and addressing local concerns effectively.	General Support, Purpose and Need of the Proposed Action, Existing Operations

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				land, feral goats proliferate the property because they are protected – to the chagrin of local hunters who know they cannot access the land. NASA, another tenant at Koke'e, values its assets at Koke'e, and often coordinates its efforts with the US Navy to either support complementary missions, or deconflict concurrent events. I don't speak for NASA, but I know of their efforts, and why they too treasure Koke'e's geographic position and altitude While I do not speak for other federal or HI State agencies also using the Koke'e site, I'm confident they too would/will support continued access, for the same reasons. The FAA, for example, tracks flights into/out of DKI International Airport, as well as trans-Pacific flights originating either from the US Mainland going east to Asia, and flights from Asia to the US Mainland. FAA radars and communications networks are integral and invaluable assets for safe commercial flights. The point remains: USN and other tenants at Koke'e are respectful of the land, the Hawaiian culture, and the contributions their assets bring to the state and nation. Operations conducted at Makaha Ridge do not adversely impact the park land per se, nor appurtenant lands. Strongly recommend existing leases be perpetuated for the reasons stated. D.H. Wilson, USN CAPT, USN (Ret)		

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30	Hayden Hislop	n/a	1	To whom it may concern, I am writing to express my strong opposition to the renewal of the Pacific Missile Range Facility (PMRF) land lease on Kauai. The renewal process has lacked transparency, with inadequate advertising, leading many to believe that the Navy is deliberately avoiding public scrutiny. This lack of due diligence is concerning, especially given the lease terms of just $1 per year, which is far below market value. The state must demand fair market value or more for this land.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Your opposition to the project is noted. As described in Chapter 1 (Purpose of and Need for the Proposed Action) of the Draft EIS, the document has been prepared consistent with state and federal laws and regulations. Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and H in the Draft EIS). As described in Section 3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at current fair market value, and would be determined through negotiations with Board of Land and Natural Resources (BLNR).	General Opposition, EIS Process, Socioeconomics
30	Hayden Hislop	n/a	2	There are critical questions regarding the state's right to lease these lands. The base facilitates activities such as “test” bombing the ocean and minor outlying	In August 2012, beach access along PMRF’s north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized	Cultural Practices, Area of Analysis

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				islands, causing significant ecological damage. The Navy must clarify which Native Hawaiian organizations they are consulting for the mandatory Section 106 Cultural Impact Assessment. Native Hawaiian rights to fish and hunt from the ocean to the mountain without needing identification must also be respected.	access to PMRF to carry out recreational activities such as fishing and surfing. Beach access maybe be limited at times due to public safety and protection of threatened and endangered species. Detailed discussions about cultural practices in the Project Area, and Cultural Impact Assessment (CIA) are described in Section 3.3 (Cultural Practices). Appendix F contains details of all personnel, including Native Hawaiians and Native Hawaiian Organizations, involved in the CIA.	
30	Hayden Hislop	n/a	3	The land currently held by PMRF could be converted into farmland to feed Kauai. Currently, this area is not utilized for agriculture, primarily due to military control and environmental contamination from chemical sprays. These chemicals, including herbicides and other hazardous substances, pose a significant threat to the local environment and public health. The ecological devastation caused by PMRF includes the diversion of water on the Mānā Plain, which disrupts traditional cultural practices and the natural wetland ecosystem. If PMRF were not there, restoring this wetland would involve reestablishing native plant species, reviving traditional taro farming (lo‘i kalo), and improving habitat for local wildlife. Such restoration would enhance biodiversity and reconnect	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The Navy and NASA’s activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities are described	Alternatives, Land Use and Access, Biological Resources, Cultural Practices, Hazardous Materials and Waste, Public Health and Safety, Air Quality and Greenhouse Gases

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				the native Hawaiian community with their cultural heritage and traditional land stewardship practices.	in the cumulative analysis (Chapter 4 of the Draft EIS). A history of land use in the project area is included in Section 1.3 (Background) and Section 3.5 (Land Use and Access) of the Draft EIS. Potential effects to public health and safety from the Proposed Action are described in Section 3.9 and potential effects from hazardous materials and waste are described in Section 3.12 of the Draft EIS. As described in Section 1.3.6 (Environmental Management and Stewardship) and Section 4.1 (Introduction to Analysis), the Draft EIS also addresses the present and future Readiness and Environmental Protection Integration (REPI) Programs, including promoting regeneration of historic wetland habitat for endemic and endangered Hawaiian waterbirds on the Mānā Plain. As described in Section 3.7 (Water Resources) of the Draft EIS, water monitoring on PMRF land (Mānā Plain) occurs quarterly (at a minimum), and all results are publicized via the Agribusiness Development Corporation (ADC) website, dating back to 2020 (https://dbedt.hawaii.gov/adc/manaplain/). Wetland areas containing native and non-native vegetation	

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					and federally protected waterbirds are present on PMRF lands. A wetland delineation was conducted in support of this EIS and can be found in Appendix N. Additionally, the Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS.	
30	Hayden Hislop	n/a	4	Additionally, the presence of PMRF has led to housing displacement for local residents, as military personnel occupy housing that could otherwise be available to Kauai's residents. This displacement exacerbates the housing crisis and impacts the social fabric of our community. Finally, PMRF stands as a symbol of the illegal occupation of Hawaii, a painful reminder of historical injustices that continue to affect native Hawaiians. The facility is also used to train foreign military forces, such as the Israeli Defense Force, further alienating the local community and contradicting our values of peace and sovereignty. For these reasons, I urge you to consider the long-term benefits of repurposing the PMRF land for agricultural use and ecological restoration. This decision would promote food security, environmental sustainability, cultural preservation, and	A discussion about current housing and potential effects to housing can be found in Sections 3.6 (Socioeconomics) of the Draft EIS. The overthrow of the Hawaiian Kingdom and the U.S. military's involvement is discussed in the Draft EIS analysis of impacts to Land Use in Sections 3.5.1.4 (History of Ceded Lands in the ROI) and 3.5.2 (Environmental Consequences). The majority of the Project Area (7,491 acres for which restrictive use easements are proposed) is currently used by other entities who lease this land from the state for agriculture and would continue to be used for agriculture under the action alternatives and No Action Alternative.	Alternatives, Socioeconomics, Biological Resources, Land Use and Access

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				social equity for the people of Kauai. Thank you for your attention to this critical issue. Sincerely, Hayden Hislop		
31	Michael Curtis	n/a	1	No more movies??? Military testing and practices improve our US and Allies performance. Unique test facility--very valuable.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Chapter 2 of the Draft EIS, Alternatives 1 and 2 would not result in changes to operations, activities, and facilities within the Project Area. The potential effects from all alternatives are analyzed and compared in Chapter 3 of the Draft EIS. Also, a comparison of alternatives is included in Section 3.14 (Summary of Potential Environmental Impacts and Mitigation Measures) of the Draft EIS.	General Support for Navy
32	Stacey Ferriera	State of Hawaiʻi Office of Hawaiian Affairs	1	Aloha e Ms. Wells: The Office of Hawaiian Affairs (OHA) is in receipt of the May 2024 Environmental Impact Statement Preparation Notice (EISPN) for the Pacific Missile Range (PMRF) and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate renewal in Waimea, Kauaʻi. Naval Facilities Engineering Systems Command has prepared this EISPN on behalf of the Department of the Navy (DON) and the National Aeronautics and Space Administration (NASA) in accordance with Hawaiʻi Revised Statutes (HRS) 343 and the National Environmental Protection Act	On behalf of the Navy and NASA, the EIS team thank you for your comments and appreciate your participation during the scoping phase of the EIS.	EIS Process

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				(NEPA). As existing real estate agreements are set to expire between 2027 and 2030, the DON is proposing to retain the use of 8,348 acres of State lands for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at PMRF. NASA also proposes to retain the use of their 23 acres of State lands in support of continued operations including measurements of the Earth's rotation and local land motion at KPGO. The DON's current real estate agreements with the Department of Land and Natural Resources (DLNR) include 684 acres of leaseholds and 7,664 acres of easement lands, for a total of 8,348 acres. Current leases and easements are primarily used for passive encroachment buffers, as well as for mission readiness, access, and utilities at the following five general locations: Main Base, Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge. No ground-based training occurs on these parcels. NASA's current real estate agreements with DLNR include 16 acres of leaseholds and 7 acres of easement lands, for a total of 23 acres. NASA issued the DON a Use Permit in 2016 for portions of KPGO to conduct radar, telemetry, and communications services in support of PMRF operations. Additionally, the Navy and NASA conduct environmental management and stewardship activities		

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				on these lands. The OHA is the constitutionally established body responsible for protecting and promoting the rights of Native Hawaiians. OHA has substantive obligations to protect the cultural and natural resources of Hawaiʻi for its beneficiaries. Accordingly, OHA is required to (1) serve as principal public agency in the State of Hawaiʻi responsible for the performance, development and coordination of programs and activities relating to native Hawaiians and Hawaiians; (2) assess the policies and practices of other agencies impacting native Hawaiians and Hawaiians; and (3) conduct advocacy efforts for native Hawaiians and Hawaiians. OHA provides the following comments pertaining historic preservation coordination, biological surveys, alternatives analysis and restoration component, ceded land trust considerations, and the recordation of comments:		
32	Stacey Ferriera	State of Hawaiʻi Office of Hawaiian Affairs	2	Historic Preservation Cooridnation The EISPN indicates that cultural resources will be identified for National Historic Preservation Act (NHPA) eligibility and HRS Chapter 6E significance. While it appears State and Federal level historic preservation compliance is required, there is no clear timeline for coordination of NHPA, HRS 6E, and NEPA compliance. It is further not clear how findings from NHPA	Navy policy, per its Environmental Readiness Program Manual (OPNAV-M 5090.1 Section 13-3.9), is to complete National Historic Preservation Act (NHPA) Section 106 consultations and agreement documents prior to the publication of the final environmental impact statement (EIS) and before signature of any record of decision. The Navy	Cultural Practices, Archaeological and Architectural Resources

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				and HRS 6E will be utilized in informing the NEPA document, especially in regards to the identification of adverse impacts to historic properties and cultural resources. Fortunately, the Advisory Council on Historic Preservation (ACHP) and Council on Environmental Quality (CEQ) did issue a handbook in March 2013 for assisting Federal agencies on integrating NEPA and Section 106 reviews. Notably, the handbook recommends coordinating the planning schedules for both NEPA and Section 106 processes as NHPA is needed to properly inform the NEPA document on possible impacts to historic properties. The handbook specifically states that, "an EA [environmental assessment] includes the Section 106 focus on which part of the proposed action could specifically affect a historic property and describes how the resource might be affected… To coordinate Section 106 and an EA, an agency would use the Section 106 adverse effect criteria in evaluating and describing effects on historic properties. Agencies may also find it helpful to relate adverse effects under Section 106 to criteria for determining the significance of impacts under NEPA... Any treatment and mitigation measures developed through the Section 106 process should be referenced in the EA and documented in a MOA [memorandum of agreement] or PA [programmatic agreement] developed in consultation with consulting parties."	is applying this policy to Hawai'i Revised Statutes (HRS) 6E and HRS 343 for this EIS. The NHPA, HRS 6E, and HRS 343 processes are being coordinated following the advice in the 2013 Advisory Council on Historic Preservation (ACHP)/Council on Environmental Quality (CEQ) handbook per OPNAV-M 5090.1 policy. This coordination is integrated into the EIS schedule, and the results of Section 106 and HRS 6E consultations are being used to prepare relevant analyses in the EIS.	

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				Thus, OHA recommends that the EIS have a clear timetable and explanation for NEPA and NHPA coordination, with enough time allotted for substantial completion of NHPA to effectively detail identified historic properties, impacts, and mitigations within the NEPA document.		
32	Stacey Ferriera	State of Hawai'i Office of Hawaiian Affairs	3	While OHA does recognize that the State level processes for HRS 6E and 343 are separate, we have been supportive of the HRS 6E process being completed or at least initiated first to assist in properly informing the environmental review process. This is commensurate with Federal level guidance on NHPA. The intent of HRS Chapter 343 is to ensure a project's impact to the environment is fully considered in the planning process and to integrate mitigation where needed to minimize significant environmental harm. Surveys are conducted to identify various environmental components (i.e., flora, fauna, historic properties) so that any adverse impacts from the proposed action can be evaluated. In determining whether historic properties will be adversely impacted, the HRS 6E review process is essential to identifying historic sites and generating mitigation commitments in consultation with the State Historic Preservation Division (SHPD). Any identified sites and resulting mitigations made during the HRS 6E review process are typically included in	Consultation with the Department of Land and Natural Resources (DLNR) State Historic Preservation Division (SHPD) is ongoing by both the Navy and NASA. Identification and evaluation of historic properties pursuant to Hawai'i Administrative Rules 42 and National Historic Preservation Act (NHPA) is in progress, and the results are included in Section 3.2 (Archaeological and Architectural Resources) of the Draft EIS. Section 3.2 of the Draft EIS also describes potential effects to these resources from the Proposed Action. Biological surveys are regularly conducted by PMRF Natural Resource Staff. Section 3.4 (Biological Resources) of the Draft EIS includes a description of existing natural resources in the region of influence (ROI) and potential effects to those resources from the Proposed Action.	Cultural Practices, Archaeological and Architectural Resources, Biological Resources

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				the environmental review for an adverse impact analysis and public comment.		
32	Stacey Ferriera	State of Hawai'i Office of Hawaiian Affairs	4	Hawai'i Administrative Rules (HAR) 11-200.1-18(d)(7) and (8) requires that impacts be identified and proposed mitigations be included within an environmental assessment. If HRS 6E is conducted after the HRS 343 process, impacts to historic and cultural resources cannot be fully identified as the statutory process to identify these environmental components is not yet completed. Furthermore, since mitigation for any adverse effects to historic properties and cultural resources are made as a result of consultation with SHPD through the HRS 6E process, proposed mitigations from this statutory process cannot be included in environmental review documents if HRS 6E is not completed first. OHA thus questions the completeness of any environmental review for projects that have not yet undergone HRS 6E review. As one of the key pillars of HRS 343 is to allow for public comment on a proposed action, deferring the HRS 6E review process to take place after HRS 343 review could hide the presence of historic properties and cultural resources that are important to Native Hawaiians from our beneficiaries and the general public. As the opportunity to include possible adverse impacts and mitigations in an environmental review would be foreclosed, our beneficiaries would not be	Consultation with the State Historic Preservation Division began on September 7, 2023.	Cultural Practices, Archaeological and Architectural Resources

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				fully informed on the proposed action when environmental review documents are specifically provided for comment. Thus, OHA recommends that the draft EIS (DEIS) demonstrate HRS 6E compliance in a way that ensures historic properties are properly identified, and mitigation provided for any adverse impacts. Further, if not done so already, OHA encourages consultation with the SHPD as soon as practicable.		
32	Stacey Ferriera	State of Hawaiʻi Office of Hawaiian Affairs	5	Biological Surveys The EISPN does acknowledge that there are Endangered Species Act (ESA) species in the region, that include the Hawaiian hoary bat (ʻopeʻapeʻa), nēnē goose, pueo, Newell's shearwater, Hawaiian petrel, and the band-rumped storm petrel. In regards to rare state-recognized endemic forest birds, the EISPN mentions that the scarlet honeycreeper or ʻiʻiwi, ʻapapane, and ʻamakihi have been observed in the Kaunuohua Ridge. Five Federally listed plants were also noted in the Mākaha Ridge, that includes the Niʻihau lobelia, makou, Hawaiʻi scaleseed, dwarf iliau, and the māʻoliʻoli. The EISPN states that potential impacts to biological resources will be evaluated. OHA recommends that any biological surveys done to determine the presence of any species must take into account seasonal considerations, be up-to-date, compare results with past surveys, and even obtain knowledge from cultural	Data collected from previous and recent biological surveys are discussed in Section 3.4 (Biological Resources) in the Draft EIS, including the results of biological surveys conducted in support of this project. As described in Section 3.4, biological surveys were conducted at various seasons throughout the year. Appendix M of the Draft EIS includes the full reports. A Cultural Impact Assessment (CIA) has been prepared for the project. The CIA is discussed in Section 3.3 (Cultural Practices) and included as Appendix F of the Draft EIS. Consultation by the Navy and NASA with United States Fish and Wildlife Service (USFWS) and Division of Forestry and Wildlife (DOFAW) is underway for this EIS.	Biological Resources, Cultural Practices

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				practitioners (with vast generational knowledge on cultural resources in the area). In regards to the latter, consultation with cultural practitioners could either be done directly or integrated with the cultural impact assessment (CIA). If not done so already, OHA recommends early consultation with both the United States Fish & Wildlife Service (FWS) and the State of Hawai'i DLNR Division of Forestry and Wildlife (DOFAW). Both entities have vast knowledge regarding endangered and threatened species, and can offer guidance on Federal and State level compliance. DOFAW may perhaps have contacts with knowledgeable cultural practitioners as well to aid in producing the most accurate biological surveys.		
32	Stacey Ferriera	State of Hawai'i Office of Hawaiian Affairs	6	Alternatives Analysis and Restoration Component The EISPN currently details that 2 long-term alternatives and one no action alternative will be explored in the DEIS. It would appear that there is not much difference between Alternatives 1 and 2 except for Alternative 2 suggesting a fee simple acquisition of 700 acres of leasehold lands. There is no alternative proposing a shorter lease term. OHA argues that a meaningful analysis of a shorter-term lease option should be included in the DEIS as constant renewal of a long-term lease creates the appearance of de facto ownership.	The EIS team understands the public's awareness and concern regarding military actions and their ability to be good stewards of the land; especially on state lands with recent events is at a high alert. Section 1.7.5 of the Draft EIS lists the current Ongoing Community Coordination that takes place amongst the PMRF staff, and the mitigation measures as listed in Chapter 5, list the current mitigations that would fall under each alternative. In addition to mitigation measures, which apply to only those resources that have been	Alternatives

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				As you are likely aware, the public's trust in the military has been shaken with recent events like the diesel fuel spill atop Haleakalā and the Red Hill fuel leak on Oʻahu. Thus, there is a greater level of public awareness and concern regarding the military's actions and their ability to be good stewards of the land. This is especially true for military operations on State lands. As such, the military must strive to build back public trust and confidence by perhaps undertaking projects that are smaller in scope and easier to manage. Such projects could further include robust restoration components to properly demonstrate that the military can effectively restore lands after they are used for military operations. Currently, the EISPN seems to suggest the possibility that if leases aren't renewed, that the DON might abandon infrastructure in place. This is unacceptable and further serves to create a liability for the State. For this reason, OHA recommends a more moderate (short-term lease) alternative option that can still accomplish bare minimum mission requirements for the military. But, perhaps more importantly, all alternatives should include a robust restoration component that shows how lands can be restored post military use, especially for lands owned by the State.	identified to have significant adverse impacts from the Proposed Action and alternatives; the Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. "Abandon in place" (this verbiage has been removed from the Draft EIS), is listed in the current lease agreement, but as such, the Department of the Navy (DON) would not create any liabilities for the state and as discussed in the Draft EIS, Section 2.3.3 - Alternative 3, "any return of state property would involve complex negotiations with the state to determine the condition of the returned lands, what infrastructure would remain, whether any remediation or restoration would be required and the extent thereof, and the transfer of various environmental and cultural responsibilities now performed by Navy and NASA back to the State." Chapter 2 of the Draft EIS includes a description of Alternatives 1 and 2 as well as other alternatives that have been considered but dismissed. Alternatives contemplating smaller footprint and shorter duration real estate agreements were considered	

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					but eliminated from detailed analysis as described in Section 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS. After this comment from the Office of Hawaiian Affairs (OHA) was received, another alternative for a shorter duration was considered. Please see Section 2.4.3 for the reasons this alternative was not carried forward for further analysis in the Draft EIS. Please note, long term is defined as anything over 25 years. In Chapter 3 of the Draft EIS, the analysis includes the permanent loss of state land through fee simple retention and how that differs from retention through non-permanent mechanisms such as leases, etc., and identifies effects to these land retention mechanisms in the Draft EIS. Consideration of how these mechanisms could be received by the public in the unique historic context of the affected environment are analyzed in Section 3.5 (Land Use and Access) of the Draft EIS. Terms of leases and easements in regards to responsibility of the Navy and NASA can be found in Appendix A of the Draft EIS. Additionally, the relevant Best Management Practices (BMPs), Standard Operating Procedures (SOPs), management	

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					strategies, and plans that apply to Navy and NASA activities in the project area are described in Section 2.5 (Best Management Practices) of the Draft EIS. Section 2.3.3 (Alternative 3) of the Draft EIS includes a description of the No Action Alternative, including the loss of mission and process steps.	
32	Stacey Ferriera	State of Hawai'i Office of Hawaiian Affairs	7	Ceded Land and Conservation District Considerations The EISPN mentions that land leased and in easement by the DON and NASA are classified as conservation or agricultural district lands. OHA notes that these State lands are also "ceded" lands as described in Section 5 of the Admissions Act. In regards to OHA's own trust responsibilities, we have a vested interest in ceded lands that are part of the public land trust. Per the State of Hawai'i Constitution, Article XII, Sections 5 and 6, the OHA trustees exercise their power "to manage and administer the proceeds from the sale or other disposition of the lands, natural resources, minerals, and income derived from whatever sources for native Hawaiians and Hawaiian, including all income and proceeds from that pro rata portion of the trust referred to in section 4 of this article for native Hawaiians…". Affirmation of OHA's public trust duties are further captured in Hawai'i Revised Statutes (HRS) Chapter 10 to assess the	Section 3.5 (Land Use and Access) of the Draft EIS includes a discussion of the History of Land Tenure and Use in the project area including the Public Land Trust established in Section 5 of the Admission Act and the Proposed Action's consistency with Public Trust Obligations. The Department of Land and Natural Resources (DLNR) conducts monitoring and inspections of the Navy and NASA leaseholds and easement lands. Solicitation of past DLNR monitoring and inspection records at PMRF should be made directly to DLNR. Regarding consultation with Office of Conservation and Coastal Lands (OCCL), Section 1.7.4 (Intergovernmental Coordination) of the Draft EIS discusses coordination with OCCL. Sections 3.5 (Land Use) and Section 6.1 (Consistency with Government Plans and Policies) of the Draft EIS discuss the project's	Land Use and Access

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				practices of other agencies and advocate where necessary to make recommendations that limit or eliminate potential irrevocable harm to cultural resources and the public land trust. As such, OHA must be consulted as part of the lease renewal process and included in discussions with the DLNR. We advise that the DEIS include direct mention of this process. As the DON and NASA have utilized these State parcels for decades, it is unclear if the State has been actively conducting periodic monitoring and site visits of these lease areas as an essential component of the State's duty to protect and preserve trust land is an obligation to reasonably monitor a third party's use of the property. To hold otherwise would permit the State to ignore the risk of impending damage to the land, leaving trust beneficiaries powerless to prevent irreparable harm before it occurs. Unless the condition of these lands is independently determined by the State, the State should arguably not entertain a process seeking renewal. Ignoring this obligation would show a disregard for the State's trust responsibilities. Procedurally, the DEIS should address any possible concerns noted by the State via an independent inspection or if an inspection is pending, detail the timeline for such inspections and subsequent report disclosures; in turn, the public would be	consistency with state laws and regulations.	

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				allowed to comment via the HRS 343 process on how these deficiencies are being corrected or not. As you are likely aware, the military use of State lands at the Pōhakuloa Training Area (PTA), on Hawaiʻi Island, was challenged in court recently (see Ching v Case). In 2019, the court ordered the State of Hawaiʻi DLNR to prepare a management plan that must include provisions for periodic monitoring of these lands as to ensure fulfillment of State trust responsibilities. OHA would assume that provisions for the State to independently conduct periodic monitoring and site visits at PTA would apply to other State lands leased by the military. In regards to conservation district use, OHA recommends that consultation with DLNR's Office of Conservation and Coastal Lands (OCCL) should already be occurring to determine what types of compliance actions are necessary to enable military utility use. This should be fully discussed in the DEIS. Arguably, it is unclear how military use is consistent with conservation district zoning uses.		
32	Stacey Ferriera	State of Hawaiʻi Office of Hawaiian Affairs	8	Recordation of Comments HAR 11-200.1-24(s)(1) states that a DEIS shall include "reproductions of all written comments submitted during the consultation period required in section 11-200.1-23." Typically, state level DEIS's or DEA's will provide copies of all written comments as they were originally	Unaltered public comments received during the public scoping comment period, as well as comments summarized by category, are included in Appendix I of the EIS.	EIS Process

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				received. OHA believes that while some agencies sometimes opt to recreate or summarize comments in their own formats, the intent of the rules is to include actual copies to demonstrate that comments were unaltered and applicable to the public scoping or early consultation process for HRS 343 compliance. As such, please include unaltered copies of any written comments received as part of public scoping meetings or in response to the EISPN.		
32	Stacey Ferriera	State of Hawaiʻi Office of Hawaiian Affairs	9	Closing Remarks Mahalo for the opportunity to comment. OHA looks forward to seeing our comments taken into consideration as the DEIS is being prepared. Should you have any questions, please contact OHA's Lead Compliance Specialist, Kamakana C. Ferreira at (808) 594-0227 or by email at kamakanaf@oha.org. ʻO wau iho nō me ka ʻoia ʻiʻo, Stacy Ferreira, Ka Pouhana, Cheif Executive Officer	Mahalo, Kamakana, for providing these comments. The Office of Hawaiian Affairs (OHA) comments were taken into consideration in the preparation of the Draft EIS. We look forward to continued coordination with OHA during development of the Final EIS.	EIS Process
33	Dayna Vierra	DLNR, Land Division	1	Thank you for the opportunity to review and comment on the subject Environmental Impact Statement Preparation Notice (EISPN). The Land Division offers the following comments: 1. Section 1.1 (Project Introduction and Overview), first paragraph, includes a statement that the Draft Environmental Impact Statement (EIS) is being prepared "in coordination with the Hawaiʻi Department of Land and Natural	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. The statement has been updated in the Draft EIS to clarify the roles of each agency.	EIS Process

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				Resources". The Department of Land and Natural Resources (DLNR) emphasizes that it is not assisting the Navy with the preparation of their Draft EIS. As the accepting authority, Staff is available for questions regarding the EIS process and DLNR will provide comments on the EIS during the official public comment period(s).		
33	Dayna Vierra	DLNR, Land Division	2	2. Section 1.1, page 1-3, paragraph 2, states: "As requested by and in coordination with DLNR, the Navy and NASA identified that an EIS is the appropriate level of environmental review for the Proposed Action…" The DLNR would like the Draft EIS to clarify that the DLNR did not make the initial determination. The Navy proposed the preparation of an EIS and the DLNR concurred with the decision. Further, we note that the referenced email is in regard to our initial review of the EISPN for compliance with Hawai'i Administrative Rules (HAR) Chapter 11-200.1 prior to the publication of the EISPN in Environmental Review Program's (ERP's) The Environmental Notice and does not pertain to the DLNR making any determination regarding the need for an EIS.	The Draft EIS has been revised in Section 1.1 (Project Introduction and Overview) to clarify: "The Navy and NASA determined that an EIS is the appropriate level of analysis for the Proposed Action."	EIS Process
33	Dayna Vierra	DLNR, Land Division	3	3. Section 1.1, page 1-3, paragraph 4, states that: "For this Proposed Action, DLNR is responsible for issuing leases and easements to the NAVY and NASA. DLNR is the agency with the responsibility for	Language has been revised in Section 1.1 (Project Introduction and Overview) of the Draft EIS to clarify: "The State of Hawai'i Board of Land and Natural Resources (BLNR) is the	EIS Process

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				approving the real estate action since the State lands are under the management of DLNR's Land Division. DLNR is required to conduct an environmental review of this Proposed Action." We wish to clarify that while the DLNR, Land Division is responsible for processing land dispositions, it is ultimately the Board of Land and Natural Resources' (BLNR's) decision to approve or deny any such land disposition actions.	approving agency and as such, issues an approval prior to implementation of the Proposed Action (HAR Section 11-200.1-2, 11-200.1-7(c)).”	
33	Dayna Vierra	DLNR, Land Division	4	4. In the forthcoming Draft EIS, please describe the type of "surveillance and tracking" that occurs at Kōkeʻe Park Geophysical Observatory (KPGO), as indicated in Section 1.2 (Project Area). Also, please clarify what is being surveilled and tracked as well as the purpose of the backup power generation.	Section 1.2 (Project Area) of the Draft EIS has been revised for clarification at KPGO to: leaseholds (16 acres) and easements (7 acres) used for NASA geodetic data collection and for Navy backup power generation, to provide consistent power during critical Navy missions as well as PMRF surveillance and tracking. Additionally, an elevated line-of-site at the KPGO site is required for PMRF to maintain surveillance and tracking of airborne and surface units operating offshore of PMRF and that are beyond the range of the surveillance and tracking from the radars as Mākaha Ridge. Surveillance is primarily for safety reasons – ensuring no surface vessels, aircraft, or personnel are in the hazard area and tracking is for determining location of an object (i.e., missile test intercept). PMRF also has Flight	Existing Operations

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					Termination System (FTS) telemetry at KPGO which is required by Range Safety for all missile launch events.	
33	Dayna Vierra	DLNR, Land Division	5	5. Section 1.3.3 (Navy Mission at PMRF) states that: "The Navy conducts missile systems tests and has supporting facilities to track and evaluate these tests from the ocean floor to the outer atmosphere." Please include in the Draft EIS, what is involved in the missile systems tests and how it affects the water, land, and air, etc. Please also clarify what are the "supporting facilities" that track and evaluate the tests. 6. Section 1.3.3 also mentions that testing occurs on the "ocean floor." Staff notes that the original lease contains an ocean right of way lease for 7,680 acres, but the current Proposed Action does not include those lands. Please explain in the Draft EIS why these submerged lands are no longer included.	As described in Section 1.3.5 (Navy and NASA Use of State Lands) in the Draft EIS, the land-based weapons systems are located on the PMRF fee simple parcels. The Navy conducts missile systems tests from the fee simple parcels, and supporting facilities that track and evaluate these tests are located on the leaseholds and easement lands at Mākaha Ridge and KPGO which is within the Project Area. These tracking operations, and other activities on the leaseholds and easement lands, are covered in this EIS analysis. Section 1.1 (Project Introduction and Overview) of the Draft EIS clarifies that the Navy holds a lease for 7,680 acres of submerged lands in an ocean Right-of-Way (ROW) at PMRF but is not pursuing a new real estate agreement for this area. The Draft EIS states the Navy will continue to use this area 31 pursuant to Section 1314(a) of the Submerged Lands Act, 43 U.S.C. sections 1301 et seq., and U.S. 32 Constitution Article I, Section 8, Clause 3.	Existing Operations, Proposed Action, Biological Resources, Water Resources, Air Quality and Greenhouse Gases, Public Health and Safety
33	Dayna Vierra	DLNR, Land Division	6	7. Section 1.3.5 (Navy and NASA Use of State Lands) makes reference to a Figure 1-4, however, it would appear that the	Figures D-1 through D-6 have been added to Appendix D to depict the	Proposed Action, Appendix D

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				figure and what is supposedly being described in Appendix D do not coincide. Please revise the figure to show the applicable leaseholds and easements as described in Appendix D.	applicable leaseholds and easement lands.	
33	Dayna Vierra	DLNR, Land Division	7	8. While we appreciate Table 2-1 (Section 2.2 Alternative Screening Process) and the descriptions given for each alternative, we believe that Alternative 1 and Alternative 2 are essentially the same action as the only difference is the land tenure mechanism (lease versus fee). While we agree that there may be different impacts given the land tenure mechanism, the DLNR would appreciate it if the Navy and NASA would analyze an additional alternative that would consider a modified Proposed Action.	In Chapter 3 of the Draft EIS, the analysis includes the permanent loss of state land through fee simple retention and how that differs from retention through non-permanent mechanisms such as leases, etc., and identifies effects to these land retention mechanisms in the Draft EIS. Consideration of how these mechanisms could be received by the public in the unique historic context of the affected environment are analyzed in Section 3.5 (Land Use and Access) of the Draft EIS. Chapter 2 of the Draft EIS includes a description of Alternatives 1 and 2 as well as other alternatives that have been considered but dismissed. Alternatives contemplating smaller footprint and shorter duration real estate agreements were considered but eliminated from detailed analysis as described in Section 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS. After the comments from Office of Hawaiian Affairs (OHA) and Department of Land and Natural Resources (DLNR) Land Division was received, another	Alternatives, Proposed Action

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					alternative for a shorter duration was considered. Please see Section 2.4.3 for the reasons this alternative was not carried forward for further analysis in the Draft EIS. In Chapter 3 of the Draft EIS, the analysis includes the permanent loss of state land through fee simple retention and how that differs from retention through non-permanent mechanisms such as leases, etc., and identifies effects to these land retention mechanisms in the Draft EIS. Consideration of how these mechanisms could be received by the public in the unique historic context of the affected environment are analyzed in Section 3.5 (Land Use and Access) of the Draft EIS.	
33	Dayna Vierra	DLNR, Land Division	8	9. In Section 2.3.1 (Alternative 1: Succeeding Current Real Estate Agreements), it states that "the Navy and NASA would continue to adhere to applicable federal and state laws as well as policies and regulations applicable to Navy and NASA regarding investigation, removal, and cleanup of hazardous and toxic materials and wastes". In the Draft EIS, please include a discussion on the environmental impacts of removal and cleanup of hazardous and toxic materials and wastes.	Section 3.12 (Hazardous Materials and Waste) of the Draft EIS includes a robust discussion on the environmental impacts of removal and cleanup of hazardous and toxic materials and wastes under the No Action Alternative. Section 3.12 also discusses potential impacts from hazardous materials and wastes from the other action alternatives as cleanup of hazardous and toxic materials and wastes are part of the Proposed Action.	Hazardous Materials and Waste
33	Dayna Vierra	DLNR, Land Division	9	10. Regarding Table 2-6, please provide the status of any surveys or programs that are supposedly implemented as a part of	Section 2.5 (Best Management Practices) in the Draft EIS includes the status of surveys and programs	BMPs

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				the Best Management Practices (BMPs) and/or management strategies as well as how often reoccurring surveys or consultation take place.	that are implemented by the Navy and NASA at PMRF and KPGO. Table 2-6 in the Draft EIS includes management strategies identified from the PMRF Integrated Natural Resource Management Plan (INRMP), as well as information on how often reoccurring surveys or consultations take place. The INRMP serves as a repository for natural resource information, provides guidance on how PMRF is to meet compliance requirements, and sets management goals, required actions, and resources necessary to protect and manage the installation's natural resources. The 2023 INRMP for the Islands of Kaua'i, Ka'ula, and Ni'ihau can be found online at www.pmrf-kpgo-eis.com. As described in Table 2-6 and Section 3.4 (Biological Resources) of the Draft EIS, various biological surveys, such as green sea turtle nesting, monk seal haul outs, invasive/endangered plant, and acoustic bat monitoring regularly occur on PMRF lands. Management strategies related to cultural or architectural resources through implementation of the Integrated Cultura Resources Management Plan (ICRMP) are identified in Table 2-6. The ICRMP is a plan that provides coordinated	

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					management of PMRF's mission with stewardship of cultural resources on PMRF in a responsible manner, consistent with the entire body of existing federal laws and regulations. A column has been added to Table 2-6 that provides the status of surveys and programs that are implemented as a part of the Best Management Practices (BMPs) and/or management strategies. A column has also been added to Table 2-6 that lists how often reoccurring surveys or consultations take place. Table 2-7 in the Draft EIS includes a list of Plans, Instruction Memoranda, and Operating and Maintenance Procedures (OMPs) applicable to the Navy's operations on the leaseholds and easement lands and the frequency of implementation.	
33	Dayna Vierra	DLNR, Land Division	10	11. The 2nd paragraph in Section 3 (Project Setting) appears to either reference two separate documents or a later version of the same document. It states that the impacts to airspace, marine navigation, and marine resources from existing training and testing will be in the Hawai'i-Southern California Training and Testing Final EIS/OEIS. Any additional analysis of future at-sea training and testing will be found in the proposed Hawai'i-Southern California Training and Testing Final EIS/OEIS. Please clarify this in the Draft EIS.	Reference to the 2018 HSTT and 2025 HCTT has been removed from Section 3 of the Draft EIS. Section 3.1.6 (Relevant NEPA and Hawai'i Environmental Policy Act [HEPA] Documents Considered in the Analysis) of the Draft EIS identifies that Appendix K includes a list of all previous HEPA and NEPA documents that have been referenced in the Draft EIS.	Biological Resources

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33	Dayna Vierra	DLNR, Land Division	11	12. In Section 3.1 (Archaeological and Architectural Resources), please be sure to include any findings regarding ʻiwi kūpuna when doing archaeological surveys.	Section 3.2 (Archaeological and Architectural Resources) of the Draft EIS includes a summary of all archaeological and architectural resources in the region of influence (ROI) (with the full report included in Appendix F), and Section 3.3 (Cultural Practices) includes a description of all the cultural practices in the ROI. Section 1.7.5 (Ongoing Community Coordination) of the Draft EIS includes reference to ongoing coordination with Native Hawaiian Organizations (NHOs) regarding discoveries of human skeletal remains, and ongoing coordination with NHOs on construction of Lua Kupapaʻu O Nohili (Nohili Burial Crypt) and ongoing coordination for repatriation.	Archaeological and Architectural Resources
33	Dayna Vierra	DLNR, Land Division	12	13. In Section 3.2 (Cultural Resources), there is mention of past and present cultural practices that have been identified through prior consultation with Native Hawaiian organizations and other stakeholders. In the Draft EIS, please include the names of those that have already been consulted with as well as those who have been consulted specifically in regard to the Cultural Impact Assessment (CIA) and their lineal ties to the project area. In addition, the DLNR requests that the Navy and NASA consult with the State Aha Moku.	Section 3.3 (Cultural Practices) and Appendix F (Cultural Impact Assessment) in the Draft EIS documents individuals consulted. The Cultural Impact Assessment (CIA) also includes an appendix with biographical information about the interviewees. Section 1.7.5 (Ongoing Community Coordination) identifies individuals and groups that PMRF partners with, including non-profit organizations and Native Hawaiian Organizations (NHOs), for events such as beach clean ups and Native	Cultural Practices, Consultation

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					Hawaiian cultural practices, respectively.	
33	Dayna Vierra	DLNR, Land Division	13	14. In Section 3.3 (Biological Resources) of the Draft EIS, please define the area of interest.	Figure 3.4-1 in the Draft EIS depicts Biological Resources in the region of influence (ROI) at PMRF and KPGO in Section 3.4 (Biological Resources). Surveys included vegetation and wetland delineation and can be found in Appendices M and N, respectively, in the Draft EIS.	Biological Resources
33	Dayna Vierra	DLNR, Land Division	14	15. Based on the description of Figure 3.3-1 in Section 3.3, 2 and paragraph, the figure should also include the noted interconnected system of irrigation ditches.	Figure 3.7-4 in Section 3.7 (Water Resources) is included in the Draft EIS and depicts the interconnected system of irrigation ditches (mostly on Agribusiness Development Corporation [ADC] land).	Water Resources
33	Dayna Vierra	DLNR, Land Division	15	16. Regarding Section 3.6 (Environmental Justice), in the Draft EIS, please provide some examples of the demographic and socioeconomic indicators that will identify potentially disadvantaged communities.	Section 3.6 (Socioeconomics) in the Draft EIS includes examples of the economic indicators of employment in income in the region of influence (ROI) that identify potentially disadvantaged communities. Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix.	Socioeconomics
33	Dayna Vierra	DLNR, Land Division	16	17. In Section 3.7 (Water Resources) of the Draft EIS, please include a discussion on the methodology of how potential impacts to water resources were evaluated.	Section 3.7 (Water Resources) in the Draft EIS includes a discussion on the methodology of how potential effects to water resources were evaluated.	Water Resources
33	Dayna Vierra	DLNR, Land Division	17	18. In Section 3.8 (Utilities), please identify (location and ownership) the “existing wells” that serve Kamokalā Ridge, Mākaha Ridge, and KPGO.	Section 3.8 (Utilities) in the Draft EIS identifies (location and ownership) the “existing wells” that are known in the region of influence (ROI).	Utilities

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33	Dayna Vierra	DLNR, Land Division	18	19. In Section 3.9 (Public Health and Safety) please provide the following: • Paragraph 3 mentions establishment of Ground Hazard Areas (GHAs) and Launch Hazard Areas over water. Please clarify if and/or how this is related to the ocean right of way lease that was mentioned in our earlier comment. • Paragraph 5 mentions safety procedures to prevent unintentional or unauthorized detonation of ordnance. Please include a description of these procedures in the Draft EIS. • Paragraph 6 talks about the transportation and handling of ammunitions, explosives, and hazardous materials. It further mentions that all ordnance is transported in compliance with PMRF Instruction 8023.G and U.S. Department of Transportation regulations. Please provide these documents or a discussion regarding these rules and regulations.	The Draft EIS Section 3.9 (Public Health and Safety) includes the following: • The Ground Hazard Areas (GHAs) and Launch Hazard Areas over water are not related to the ocean right-of-way (ROW). The ocean ROW is the ROW for the communication cables for the ocean ranges. • Ordnance is transported in compliance with PMRF Instruction 8023.G and U.S. Department of Transportation regulations. Ordnance transportation procedures are outlined in the Draft EIS in Section 3.9. PMRF Instruction 8023.G contains sensitive information and cannot be distributed. Relevant Plans, Instruction Memorandum, and Operating and Maintenance Procedures are provided in Section 2.5 (Best Management Practices) of the Draft EIS. Discussion regarding compliance with these rules and regulations is in Section 3.9 (Public Health and Safety).	Public Health and Safety, Transportation
33	Dayna Vierra	DLNR, Land Division	19	20. Please note that on Page 3-14, Section 3.10.1 (Air Quality), all the other elements listed in the first paragraph have their abbreviated symbol except lead (Pb).	The abbreviation symbol for lead has been added in the Draft EIS.	Air Quality and Greenhouse Gases

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33	Dayna Vierra	DLNR, Land Division	20	21. In Section 3.12 (Hazardous Materials and Wastes), it mentions that used oil is taken to the Main Base to be recycled. In the Draft EIS, please provide the procedures followed in the event of an oil spill during transport. Also, please provide a copy or access to the various hazardous materials management plans that are mentioned in this section.	An overview of the Navy's procedures that would be followed in the event of an oil spill per the PMRF Oil and Hazardous Substance Spill Contingency Plan can be found in Section 3.9 (Public Health and Safety) of the Draft EIS. This Plan contains sensitive information and cannot be publicly distributed. However, the Plan outlines procedures to be followed in the event of a spill (in flow chart form), and is available on the PMRF KPGO EIS website, www.pmrf-kpgo-eis.com.	Hazardous Materials and Waste
33	Dayna Vierra	DLNR, Land Division	21	22. Non-common words or actions - There are several instances in the document where there is use of potentially non-common words or actions. It would be appreciated if you were to include either definitions of the words or explanations of the actions. For example, in Section 1.1 the term “local land motion” is used. A definition or explanation on what local land motion is would be beneficial. Also, in Section 1.2, there is mention that Miloliʻi Ridge is used for radar and telemetry activities. It would be helpful if there was an explanation of what telemetry activities are.	A glossary is included in the Draft EIS (Appendix A), which describes potentially non-common words or actions.	Definitions
33	Dayna Vierra	DLNR, Land Division	22	23. Acronyms - The acronyms for Office of Planning and Sustainable Development (OPSD) and the Space Exploration Network Services and Evolution (SENSE), are not included in the main document	The Draft EIS has been reviewed and all abbreviations and acronyms have been added.	Acronyms

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				and on the Abbreviations and Acronyms page (vii). A further review of the document may be warranted to check if there are other omissions.		
33	Dayna Vierra	DLNR, Land Division	23	24. Hawaiian Diacritical Markings – In Section 1.3.1, the Hawaiian diacritical mark (the kahako) is missing from the word Kalākaua. A further review of the document may be warranted to check if there are other omissions. Should you have any qeustions or concerns regard this correspondence, please contact Dayna Vierra aof the Land Division at (808) 587-0423. Sincerely, Russell Y. Tsugi, Administrator Land Division.	The Draft EIS has been reviewed to ensure the use of Hawaiian diacritical markings is consistent throughout. Mahalo, Dayna, for providing these comments. The Department of Land and Natural Resources (DLNR) Land Division comments were taken into consideration in the preparation of the Draft EIS. The EIS team looks forward to continued coordination with DLNR Land Division during development of the Final EIS.	Diacriticals
34	Kendall Tucker	State of Hawai'i, Division of Aquatic Resources	1	Thank you for providing DAR with the opportunity to comment. During the EIS process, DAR would like to request that all streams, waterways, and ocean resources be delineated in the map of the proposed area. Any potential impacts should be discussed, any threatened and endangered species that can be found in the area should be identified, and mitigation measures should be proposed, as is typical of an EIS. DAR looks forward to reviewing the EIS after it is prepared.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Streams, waterways (irrigation ditches), wetlands, and aquifers will be delineated in figures in Section 3.7 (Water Resources). Impacts to biological resources, such as threatened and endangered species, and related mitigation measures, are discussed in Section 3.4 (Biological Resources). The scope of this EIS encompasses territorial leaseholds and easement lands; therefore, marine resources are not covered in the scope of this EIS. Exceptions to marine resources include endangered species, monk	Water Resources, Biological Resources

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					seals and sea turtles, which utilize the terrestrial region of influence (ROI) covered in the scope of this EIS.	
35	Linda Oshiro	n/a	1	I was not able to attend the Kekaha meeting due to conflicting obligations. I have lived in Hawaii 54 years, with the last 10 years next to the ocean in Kekaha. Your military activities, your electromagnetic surveillance of the coast, affects my personal energy field with excess stimulating energy that makes sleep difficult. It was proved your use of sonar affected the dolphins and whales. You seem not to care what your microwave radar towers or electromagnetic surveillance does to the human population I am aware of the harm created by your activities and the target you have made of us and what a large landowner you have become and i am not happy with your presence Linda Oshiro	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. We value your concerns. As described in Chapters 1 and 2 of the Draft EIS, the scope of the EIS includes terrestrial leaseholds and easement lands; therefore, marine resources, such as dolphins and whales, are not covered in the scope of this EIS. Potential effects from the Proposed Action to marine resources, including the endangered monk seal and sea turtle that utilize the terrestrial region of influence (ROI), are described in Section 3.4 (Biological Resources) of the Draft EIS. As described in Section 3.9 (Public Health and Safety) in the Draft EIS, civilians and base personnel are excluded from the radiation hazard area, and warning signs are posted during operations for public safety.	General Opposition, Public Health and Safety, Biological Resources, Existing Operations
36	Melissa Nash Family	n/a	1	My name is Melissa Nash, I am a resident of Kauai where my family homesteads in Moloa'a and teach island keiki and visiting families about beekeeping. We love the Aina and her creatures and are very concerned with the PMRF leasing the land	The Navy and NASA thank you for your comments and appreciate your participation. The Navy does not lease any land in the Project Area to companies for agriculture, nor does it have the	Land Use and Access, Biological Resources, Water

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				within their own lease to big ag companies who grow GMO crops and spray harmful pesticides in large experimental quantities. This poison goes into the land, the water and touches everything in its path. We would like to see the water on the west side restored to pre-plantation, natural routes, diversions removed and the land healed by Native Hawaiians. We would like to see this land used not for big ag to experiment, but to house local families who want to live close to the land and help heal it. We would like to see hemp grown, which can remediate the soil so it's safe for families to grow and live here. We don't need big ag to lease and poison the land. But we do need places for local Hawaiian families to cultivate so they don't have to leave the island in the ever growing housing crisis. Please stop working with the big ag corporations. Sincerely, Melissa Nash & family	authority to do so. The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities are described in cumulative analysis (Chapter 4 of the Draft EIS) but are not conducted by the Navy or NASA. The Department of Land and Natural Resources (DLNR) leases these lands directly to Agribusiness Development Corporation (ADC) and Kekaha Agricultural Association (KAA), please see Chapter 4. The Draft EIS addresses the Navy's Readiness and Environmental Protection Integration (REPI) Programs, which include promoting regeneration of historic wetland habitat for endemic and endangered Hawaiian waterbirds on the Mānā Plain, please see Section 1.3.6 (Environmental Management and Stewardship) and Section 4.1 (Introduction to Analysis). A current REPI project also includes the creation of an open floodable space to reduce the quantity and improve the quality of stormwater runoff discharged from agricultural	Resources, Socioeconomics

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					drainage ditches into the nearshore environment at PMRF. Additionally, a wetland delineation was conducted in support of this EIS and can be found in Appendix N. Outside of the REPI programs, the Navy does not have the authority to alter the current water system on the state-owned lands on the Mānā Plain. We value your concerns. To discuss your ideas about agricultural practices on the restrictive use easement lands, the EIS team suggests reaching out to ADC or KAA.	
37	Helen Cox	Kauai Climate Action Coalition	1	Thank you for the notice of the Pacific Range Missile Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO) Environmental Impact Statement (EIS) scoping process. Kaua'i Climate Action Coalition is an island wide organization with more than 165 members whose mission is to work collaboratively to educate, advocate and take direct action to address the climate crisis. We welcome the opportunity to provide input. We are sure you are aware that the US military is one of the world's largest greenhouse gas polluters, and we appreciate all efforts to mitigate this enormous problem. However, input to the scoping of the EIS is made difficult because the public has no information regarding the full scope of PMRF activities.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. The scope of analysis for this EIS is described in Section 1.5 (Scope of Environmental Analysis) and includes securing new leaseholds and easement lands and does not include additional activities or development. As described in the Draft EIS, PMRF testing and training activities conducted on fee simple lands have all been previously addressed in the 2018 Hawaii-Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS) and the 1998 PMRF Enhanced Capability EIS. Both of these documents are publicly available and can be found on the	EIS Process, Existing Operations

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				Our comments below, therefore, are made from a limited understanding of PMRF's current activities and their impacts.	PMRF KPGO EIS website (www.pmrf-kpgo-eis.com).	
37	Helen Cox	Kauai Climate Action Coalition	2	1. Conduct an environmental assessment of its natural lands and those adjacent to it and compare the findings to the last EIS. Have the coastal lands, near shore environments, and wetlands been enhanced or degraded? Have endangered species increased or decreased from the last EIS? How will negative effects be mitigated? 2. Assess emissions from all sources at PMRF and report those transparently. 3. Analyze and mitigate the pollutants produced at PMRF. The missiles, the diesel trucks, the tow motors, the aircraft, the commuter cars, the laundry equipment, the electricity used, etc. etc. If there are secret military test projects that pollute, they should be looked at and mitigated confidentially. Please tell us if there is laser and electromagnetic research there, because of the massive expenditure of electricity that is used. Please include the submarine and drone boat emissions also. What will be done to mitigate these impacts?	1) Section 3.4 (Biological Resources) of the Draft EIS describes potential effects from the Proposed Action (including noise and light pollution) and is supported from baseline flora and fauna studies conducted in support of this EIS. Sections 2.5 (Best Management Practices) and 3.4 also identify protection and mitigation measures implemented at PMRF to protect biological resources. Section 3.7 (Water Resources) of the Draft EIS includes a description of the existing condition of wetlands in the project area and describes potential effects from the Proposed Action. A wetland delineation was performed within areas identified in the assessment with potential for wetlands; results suggest that the only potential wetlands within the region of influence (ROI) appear to be hydrologically connected to the ditches, with water likely flowing back and forth between the ditches and wetlands. The results have yet to be verified by the U.S. Army Corps of Engineers. The wetland delineation can be found in Appendix N.	EIS Process, Biological Resources, Air Quality and Greenhouse Gases, Transportation

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					Sections 2.5 and 3.7 also identify protection measures implemented to protect water resources, including wetlands. 2) Section 3.10 (Air Quality and Greenhouse Gases) of the Draft EIS describes potential effects from the Proposed Action to air quality (including emissions). As described in Sections 1.3 (Background) and 3.4 of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the project area are focused on mitigating risk to these resources and the base's military mission. Additionally, each resource chapter in the EIS contains a table summarizing predictable environmental trends. 3) Since the scope of this EIS is limited to land-based leaseholds and easement lands, marine-related activities, such as from submarines and boats, are outside the scope of this EIS. As described in Section 1.3.3 (Navy Mission at PMRF), for information regarding at-sea military activities please refer to the 2018 Hawaii-Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS). This document can be found on the EIS website at www.pmrf-kpgo-eis.com.	

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					As described in Section 3.9 (Public Health and Safety), electromagnetic radars, which provide support to missile tracking and surveillance activity, are located on Mākaha Ridge. Mitigation measures and procedures that are followed to minimize risk are discussed in Section 3.9. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-6 discusses public health and safety, and the improvements to closure protocol and public notification of the activation of restrictive easements during launch activities at PMRF Main Base. Chapter 5 of the Draft EIS describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Finally, this chapter presents potential compensatory mitigation measures for consideration to offset remaining unavoidable adverse environmental effects from the Proposed Action and alternatives analyzed in this EIS.	

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37	Helen Cox	Kauai Climate Action Coalition	3	4. We are aware that PMRF biologists removed healthy Kiawe forests. Consider a native lowland forest restoration project that would both remediate the soil and capture at least some of the massive amount of CO2 emitted by PMRF? 5. The land around PMRF was formerly agricultural, much of it still in agriculture. What are the Navy's intentions and what are the impacts?	4) The Navy has recently conducted kiawe removal and a native species revegetation project below the North Launch Pad on fee simple land. As stated in Section 3.4 (Biological Resources) of the Draft EIS, kiawe is a non-native species located in the leaseholds and easement lands and in the vicinity of PMRF. As described in Section 3.4, PMRF Natural Resource Staff target noxious weeds provided by Kaua'i Invasive Species Council (KISC) identified for early detection and rapid response. Removal of invasive plants and native plant restoration at PMRF in the project area are discussed in Section 2.5 (Best Management Practices) and Section 3.4. 5.) The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how	Biological Resources, Air Quality and Greenhouse Gases

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					these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities, conducted by Kekaha Agricultural Association (KAA) and the Agricultural Development Corporation (ADC), are described in cumulative analysis (Chapter 4 of the Draft EIS). A history of land use in the project area is included in Section 1.3 and Section 3.5 (Land Use and Access).	
37	Helen Cox	Kauai Climate Action Coalition	4	6. Assess the impacts climate change will have on PMRF and how these will be mitigated. Impacts will include sea level rise, increased wildfires, water issues, and heat, among others.	6) Potential effects from the Proposed Action to natural resources are discussed in Sections 3.4 (Biological Resources) and 3.7 (Water Resources), and potential effects from the Proposed Action to air quality and greenhouse gas emissions are discussed in Section 3.10 (Air Quality and Greenhouse Gases). A map showing the 3.2-foot sea level rise scenario is included in Section 3.1.2 of the Draft EIS, and predictable environmental trends (including sea level rise) are discussed in each resource section. Also, please refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) in regard to renewable and clean energy projects ongoing and slated for future development. As described in Sections 1.3	Air Quality and Greenhouse Gases, Sea Level Rise

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					(Background) and 3.4 of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the Project Area are focused on mitigating risk to these resources and the base's military mission.	
37	Helen Cox	Kauai Climate Action Coalition	5	7. Inspect and possibly remove or replace the fuel storage tanks at PMRF since they are the same generation as those at Red Hill. Findings should be shared with the public.	7) The Draft EIS includes a discussion on the use of best management practices (BMPs) that are in place to prevent unintentional release of fuels in Section 3.12 (Hazardous Materials and Waste). Tables within Section 3.12 summarize the storage tanks located within the Project Area and include storage tank size, use, and secondary containment measures. An overview of the Navy's procedures that would be followed in the event of an oil spill per the PMRF Oil and Hazardous Substance Spill Contingency Plan can be found in Section 3.9 (Public Health and Safety) of the Draft EIS. Additionally, the Plan outlines procedures to be followed in the event of a spill (provided in flow chart form), and is available on the PMRF KPGO EIS website, www.pmrf-kpgo-eis.com.	Hazardous Materials and Waste
37	Helen Cox	Kauai Climate Action Coalition	6	8. Explore how PMRF can partner with local organizations to increase the sustainability and resilience of the island. 9. Consider whether PMRF needs all the land it currently holds and reduce the land	8) As described in Section 1.7.5 (Ongoing Community Coordination) in the Draft EIS, PMRF partners with non-profit organizations and Native Hawaiian Organizations (NHOs) for	Land Use and Access, Biological Resources, Alternatives

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				holdings in the lease if possible. Submitted by Helen A Cox, Chair, Kaua'i Climate Action Coalition, kauaiclimate@gmail.com	events such as beach clean ups and Native Hawaiian cultural practices, respectively. Information about PMRF's coordination with NHOs is described in Section 3.3 (Cultural Practices) in the Draft EIS. Also, a description of the Navy's use of land at PMRF is included in Section 1.3 (Background) and a description of alternatives considered is included in Chapter 2 (Proposed Action and Alternatives) in the Draft EIS. Chapter 2 of the Draft EIS includes a description of Alternatives 1 and 2 as well as other alternatives that have been considered but dismissed. Alternatives contemplating smaller footprint and shorter duration real estate agreements were considered but eliminated from detailed analysis as described in Section 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) which	

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					seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders. EMM-5 also discusses the establishment of a Kaua'i Navy-Department of Land and Natural Resources (DLNR)-Department of Hawaiian Homelands (DHHL)-Agribusiness Development Corporation (ADC) working group to collaboratively manage water resources in West Kaua'i.	
38	Bonnie P Bator Ohana	n/a	1	To: Whom It May Concern : DLNR state of Hawaii AND U.S. Navy / PMRF AND National Aeronautics and Space Administration (NASA) NO ACTION - We adamantly agree: ~ NO ACTION ~ "NO" to ALL proposed real estate agreements with the state of Hawaii for the Pacific Missile Range Facility (PMRF) and the Koke`e Park Geophysical Observatory (KPGO) -NO continuance of long-term lease of the Department of Defense use of the 8,348-acres of Crown Lands - The Ceded Land Trust Koke`e, Kaua`i -NO to the SPECIFIED 410 acres, which the U.S. Navy PMRF -NO to NASA proposal of continuance of the leasing AND long-term use of the 23-acres of Crown Lands - The Ceded Land Trust Koke`e, Kaua`i - of named: NASA Koke`e Park Geophysical (KPGO)	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Your opposition to the project is noted. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands. All comments received during the scoping period are included in this appendix of the Draft EIS. Updates to the project can be found on the PMRF KPGO EIS	General Opposition

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				ABSOLUTELY `A`ole NO to the proposed action: in the PMRF-KPGO in the draft Environmental Impact Statement (dEIS) We look forward to acknowledgement of Our participation and implementation of NO ACTION ALTERNATIVE ... Please keep Us abreast of any/all updates in the dEIS scoping process via U.S.Postal Service (USPS) - regarding Our comments - of the draft Environmental Impact Statement scoping process ALOHA `ĀINA, MAHALO Loa Sincere ALOHA, Bonnie P Bator `Ohana (Keana`aina, Keli`ikoa, Kai`aokamalie & Kai)	website (www.pmrf-kpgo-eis.com). Your contact information has been added to the mailing list for the project.	
39	Louise Sausen	n/a	1	I oppose Navy acquisition of 8,000 acres of CROWN LANDS 💧 😡 💧 Especially when Kanaka are being PRICED OUT OF OUR ONE HANAU 💧 😡 💧 Keep Hawaiian lands for Hawaiian people 🌺 🌟 💖 🌟 🌺	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Your opposition to the project is noted. Alternative 1 of the Proposed Action is described in Chapters 1 and 2 of the Draft EIS and includes the Navy retaining use of 8,172 acres of state land, rather than acquisition. Alternative 2 in the Draft EIS, as a point of comparison, describes and compares potential impacts from the acquisition of 700 acres of state land (684 acres for Navy use and 16 acres for NASA use) to Alternative 1. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No	General Opposition to Navy, Land Use and Access

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					Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
40	Regina Gregory	n/a	1	Scopting Comments, PMRF 1. Linking to the NASA Observatory seems like another military land grab. Instead, you should include your environmental impacts on Ni'ihau, Kwajalein, the 1,100-square-mile instrumented underwater range, and the broader ocean impact area. 2. Excluding people from the land is a major impact. A nearly 8,000-acre "buffer zone" is excessive and could be reduced. Your assessment should also include options to retain less land, e.g., omit Kamokalā Ridge, the Mānā Water Well, Miloliʻi Ridge, and/or Makaha Ridge. 3. The Hawai'i Supreme Court has already ruled that leasing public lands to the US military is not in keeping with DLNR's duty to safeguard that land. It also runs counter to the "reconciliation" called for in Public Law 150-103. The sale of public lands is strongly discouraged by law. In fact, the entire US military presence in Hawai'i rests on a shaky foundation of illegal occupation.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The EIS has been prepared consistent with the current federal and state legal framework. The scope of the analysis is described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS and encompasses land-based Navy and NASA leaseholds and easement lands with the Department of Land and Natural Resources (DLNR) on Kauaʻi, Hawaiʻi. Lands outside of the region of influence (ROI), including ocean resources, are outside the scope of this EIS. Other alternatives were considered but not carried forward into the EIS because they did not meet the purpose and need for the project (see Section 1.4 and Chapter 2). As described in Section 2.3	EIS Process, Area of Analysis, Alternatives, Land Use and Access

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					(Alternatives Carried Forward for Detailed Analysis) of the Draft EIS, under Alternatives 1 and 2, the Navy and NASA propose to maintain the size of current real estate agreements and do not propose any development.	
40	Regina Gregory	n/a	2	4. The "no action" alternative is clearly preferable environmentally. Under this option, the Navy should not be allowed to simply abandon it, but be required to clean it up. That will create a lot of jobs!	Analysis of potential impacts from the No Action Alternative is included in the Draft EIS consistent with regulatory requirements. As described in Section 2.3.3 (Alternative 3) in the Draft EIS, under the No Action Alternative the Department of Land and Natural Resources (DLNR), Navy, and NASA would collaborate if existing infrastructure on the state lands would be removed, and any remediation required before the state reacquired control of the property would be negotiated. Potential impacts from this alternative are described under each resource in Chapter 3 of the Draft EIS.	General Opposition to Navy, Alternatives, Socioeconomics
40	Regina Gregory	n/a	3	5. Leading STEM students into military careers should not be considered a benefit. It takes them away from more useful endeavors like renewable energy, water management, and other forms of progress toward sustainability instead of destruction. Economic impacts should include not only income from DoD, but also loss from	Potential effects to socioeconomics from the two action alternatives and the No Action Alternative are described in Section 3.6 of the Draft EIS. Economic impacts that analyze alternative uses of land is speculative and is beyond the scope of this EIS.	Socioeconomic Impacts, Land Use

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				alternative uses of the land. Regina Gregory		
41	Laney Gordon	EPA, Region 9	1	Dear Kerry Wells: The U.S. Environmental Protection Agency has reviewed the above-referenced document. We are providing comments pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to the EPA. It requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement. The U.S. Navy and the National Aeronautics and Space Administration (NASA) intend to prepare a Draft Environmental Impact Statement (DEIS) to evaluate the potential environmental impacts of the proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO) project. The Department of Defense utilizes 8,348 acres of State lands on Kaua'i for operational continuity and sustainment of the PMRF, including military training, testing, and facility operations. The continued long-term NASA use of 23 acres of State lands is in support of continued KPGO operations, including	On behalf of the Navy and NASA, the EIS team thanks the Environmental Protection Agency (EPA) for their comments.	EIS Process

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				measurements of the Earth's rotation and local land motion.		
41	Laney Gordon	EPA, Region 9	2	Review Summary The Preparation Notice of the DEIS is primarily a disclosure document for a real estate action to be negotiated with the State of Hawai'i. As such, EPA did not identify significant public health, welfare, or environmental quality concerns to be addressed in the Draft EIS. For your consideration, we have recommendations regarding environmental justice and climate change, to enhance disclosure and further distinguish impacts in and around the project area. Please see the attached detailed comments. The EPA Appreciates the opportunity to review this NOI for the Draft EIS for the Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory. If you have any questions, please contact me at (213) 244-1834 or contact Laney Gordon, the lead reviewer for this project, at (415) 972-3562 or gordon.laney@epa.gov. EPA'S DETAILED COMMENTS ON THE NOTICE OF PREPARATION OF A DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PACIFIC MISSILE RANGE FACILITY AND KŌKE'E PARK GEOPHYSICAL OBSERVATORY REAL ESTATE AGREEMENT, KAUAI, HAWAII – June 17, 2024	The Navy and NASA appreciate the proposed recommendations. Potential effects from the Proposed Action to public health and safety are discussed in Section 3.9, and to land use and access in Section 3.5of the Draft EIS. Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix.	EIS Process, Land Use
41	Laney Gordon	EPA, Region 9	3	Environmental Justice We appreciate the discussion in the Preparation Notice of the Draft EIS regarding the history of land tenure in	Executive Order 14148 "Initial Rescissions of Harmful Executive Orders and Actions" (90 FR 8237) revoked prior executive orders	Socioeconomics, Land Use

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				Hawai'i, documented in the Land Use section and Appendix A. There are continuing effects from this history that weigh on members of the Native Hawai'ian community, expressed through comments during scoping, that are not captured in the document. These remarks were reiterated during public meetings for the project on June 4, 2024; some of the public's concerns were also reported in the Kauai Now News on June 9, 2024. These comments reference Native Hawai'ians' cultural attachment to the land, and stress that their native lands were wrongly taken. The comments specifically cite the $1.00 fee paid by the Army in 1964 for the 65-year lease as an example of inequity. Recent Executive Orders direct the entire Federal Government to advance equity and racial justice for underserved communities, including Native Hawaiian/Pacific Islander communities. Executive Order 13985: Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (January 20, 2021) directs federal agencies to evaluate whether their policies produce racially inequitable results when implemented, and to make the necessary changes to ensure underserved communities are properly supported. Executive Order 14031: Advancing Equity, Justice, and Opportunity for Asian Americans, Native	requiring the analysis of Environmental Justice concerns in NEPA. Therefore, an Environmental Justice discussion is not carried forward as a resource section in the DEIS. Information regarding the history of leases and easements can be found in Section 3.5 (Land Use and Access) of the Draft EIS. As described in Section 3.6 (Socioeconomics) of the Draft EIS, the fair market value will be determined in collaboration with relevant parties and shareholders when a final action is carried forward. The overthrow of the Hawaiian Kingdom and the U.S. military's involvement is discussed in the Draft EIS analysis of impacts to Land Use in Sections 3.5.1.4 (History of Ceded Lands in the ROI) and 3.5.2 (Environmental Consequences).	

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				Hawaiians, and Pacific Islanders (May 28, 2021) seeks to eliminate barriers to equity and justice for these populations. We also note that the Department of Defense's Equity Action Plan, pursuant to EO 13985, includes a strategy "to advance equity and rectify past harms" resulting from environmental and other impacts from defense activities on ancestral lands. These directives should be considered in the context of the project, to help guide decisionmaking.		
41	Laney Gordon	EPA, Region 9	4	Additionally, the guidance document Promising Practices for EJ Methodologies in NEPA Reviews may be helpful to consult when determining how non-chemical stressors (e.g., chronic stress related to environmental or socio-economic impacts) amplify impacts. As stated in that document, "The cumulative ecological, aesthetic, historic (emphasis added), cultural, economic, social, or health effects of a proposed action can arise from and also include non-chemical stressors" (p. 32). Recommendations: In the Draft EIS, consider how the permanent loss of State land through fee simple retention differs from retention through non-permanent mechanisms such as leases, etc., and discuss impacts related to these land retention mechanisms. Consider how these mechanisms could be received by the public, including communities with environmental justice concerns, in the	Regarding Promising Practices for Environmental Justice Methodologies in NEPA Reviews, please see response to comment #2. Section 3.6 of the Draft EIS discusses the potential socioeconomic impacts to communities from the Proposed Action. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1. EMM-4, the development and continuation of the One Kauaʻi Hui (Stakeholder Engagement Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community and other interested stakeholders, is	Socioeconomics

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				unique historic context of the affected environment. We recommend that conclusions regarding environmental justice impacts attempt to reflect the mental and emotional health impacts and the larger cumulative sense of loss and injustice, and not only the impacts to specific resources (e.g., transportation, recreation/hunting, or to cultural resource access). After reviewing and identifying these additional military land use impacts on environmental justice, please identify corresponding mitigation measures in the Draft EIS. Examples could be establishing regular communication channels to strengthen relationships with the Native Hawaiian community, and in consultation, exploring other State-owned military lands that may be underutilized and could be repurposed for community use.	discussed in Table 5.2-1 of the Draft EIS.	
41	Laney Gordon	EPA, Region 9	5	Climate change effects/incorporating resilience The newly added PMRF site is very close to the shoreline. Should this site be selected, the facilities will experience various climate change effects that can bear on both the project and on environmental resources. According to the State of Hawai'i Sea Level Rise Viewer, the shoreline of Kauai at the project site will experience sea level rise and coastal erosion that approaches the development site. The FEMA flood hazard zone already begins to encompass the site, and	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes	Sea Level Rise, Air Quality and Greenhouse Gases, Water Resources

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				additional hazards associated with storm waves are indicated. Modeling results for the 1%-annual-chance coastal flood zone with 3.2 feet of sea level rise, which estimates coastal flood extents for wave-generating events including tropical storms, hurricanes, tsunamis and other severe wave events, show the entire PMRF within the coastal flood zone. This indicates increased vulnerability to coastal event-based flooding by the year 2100. Please refer to the West Kaua'i Community Vulnerability Assessment for more information. We understand it is Department of Defense (DoD) policy to identify and assess climate change effects on the department's mission, and to consider them when developing plans. According to a DoD reporta decision that involves enduring or permanent infrastructure meant to perform at least 50 years into the future, is mission critical with limited alternative options, and represents an irreversible commitment of resources, would dictate a consideration of higher-end sea level rise scenarios.	an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. Easement 2 is the only easement located along the shoreline at Polihale State Park, and as described in Appendix D this is a restrictive use ground hazard area easement. As described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS, the Navy does not conduct activities on these easement lands. A map showing the 3.2-foot sea level rise scenario is included in Section 3.1.2 of the Draft EIS, and predictable environmental trends (including sea level rise) are discussed in each resource section. Potential effects from the Proposed Action to natural resources are discussed in Sections 3.4 (Biological Resources) and 3.7 (Water Resources), and potential effects from the Proposed Action to air quality and greenhouse gas emissions are discussed in Section 3.10 (Air Quality and Greenhouse Gases). Also, please refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) in regard to renewable and clean energy projects ongoing and slated for future development. As	

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					described in Sections 1.3 (Navy and NASA Use of State Lands) and 3.4 (Biological Resources) of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the Project Area are focused on mitigating risk to these resources and the base's military mission. Additionally, each resource chapter in the EIS contains a table summarizing predictable environmental trends.	
41	Laney Gordon	EPA, Region 9	6	Recommendations: EPA strongly recommends that the design of the PMRF alternative include components to protect the asset from climate change effects. Prioritize preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change. Discuss applicable nature-based project elements that can be integrated into the project design, exemplified by the U.S. Army Corps of Engineers "Engineering with Nature" program. Discuss both gray and green infrastructure, and combinations of both. Discuss whether increasing dune restoration would protect both the project and important cultural sites. Discuss how current groundwater pumping at PMRF will affect the project, and if updating	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The impact analysis in Chapter 3 for each resource describes effects from ongoing activities and potential effects from the Proposed Action. Also, please refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) in regard to renewable and clean energy projects ongoing and slated for future development, including the Mānā Plain Open Floodable	Proposed Action, Water Resources

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				pumping practices would increase resilience.	Space Project and nature-based solutions. Removal of invasive plants and native plant restoration at PMRF and the project area are discussed in Sections 2.5 (Best Management Practices) and Section 3.4 (Biological Resources) of the Draft EIS. Potential effects to water are discussed in Section 3.7 (Water Resources) of the Draft EIS.	
41	Laney Gordon	EPA, Region 9	7	It is also important to acknowledge, as noted in the West Kauai vulnerability assessment, that sea level rise threatens the West Kauai transportation system, including the Kaumualiʻi Highway, which is vulnerable to sea level rise (i.e., erosion, passive flooding, wave inundation), heavy rainfall, and storm events. According to the specific Navy environmental stewardship activities (pg. 1-13) and the Best Management Practices (BMP) in Table 2-6 of the Preparation Notice, there are plans to establish a "monitoring program for the nearshore environment of the PMRF to inform future management decisions and monitor changes over time." The Draft EIS should assess the environmental impacts to relevant resources that would occur as a result of project elements necessary for climate change adaptation. It is important that these project elements be explored now and not be deferred, as time may be needed to develop nature-based project	See response to comment #6 regarding upcoming cumulative projects. The Proposed Action does not include any change in activities or construction. A map showing the 3.2-foot sea level rise scenario is included in Section 3.1.2 of the Draft EIS, and predictable environmental trends (including sea level rise) are discussed in each resource section. Each resource chapter in the EIS contains a table summarizing predictable environmental trends. The Navy and NASA are also presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS.	Proposed Action, Biological Resources, Sea Level Rise

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				features. Hardening features such as sea walls and revetments should be included only after nature-based solutions have been fully explored.		
41	Laney Gordon	EPA, Region 10	8	We believe full use of the NEPA process will be especially informative for this project and if undertaken well, can prove particularly valuable for decision-makers. Please let us know if the EPA can assist in this endeavor through early involvement during the NEPA process.	Mahalo for your engagement and participation in the scoping process. We appreciate the comments you provided. Please refer to the letter sent to you on September 9, 2024 that directs you to our team contact information should you have any further questions or require further information regarding the EIS.	EIS Process
42	Ray Catania Puhi	n/a	1	Aloha, Went to the June 6 presentation at Sheraton Coconut Beach. Our Hawaii ocean environment and Kanaka cultural resources and it's protection are being used to build U.S. military superiority in the Pacific and Asia- "from the ocean bottom up to the atmosphere." But also, Israel/IDF inclusion is part and parcel of U.S. dominance in the Middle East and the continued subjugation of the Palestinian people. Good and sincere people who believe in ocean/environmental and Kanaka cultural issues have been recruited for this purpose. Diplomacy and non-violence is the answer. What happened to civilians in Nagasaki and Hiroshima are historical lessons we should take to heart. This is "green imperialism." Mahalo, Ray Catania Puhi	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Your opposition to the project and military is noted. The Proposed Action is described in Chapters 1 and 2 of the Draft EIS, and includes securing new real estate agreements and does not include additional development or additional testing and training activities. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). Potential impacts to cultural resources and biological resources from the Proposed Action can be	Water Resources, Cultural Practices, General Opposition to Navy

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					found in Sections 3.2 (Archaeological and Architectural Resources), 3.3 (Cultural Practices), and 3.4 (Biological Resources) of the Draft EIS.	
43	Ruta Jordans	Zero Waste Kauai	1	PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, Thank you for the opportunity to make suggestions that should be considered by PMRF in its Real Estate Environmental Impact Statement. Zero Waste Kauai was founded in 2006. Our mission is to educate, inspire and assist the government, businesses, residents and visitors of Kauai in transitioning to a zero waste society and to advocate policies and implement programs that move Kauai toward a zero waste society. Zero Waste Kauai is most concerned about environmental impacts of waste generation and disposal. We appreciate the large solar array at PMRF which has decreased the use of fossil fuels to produce energy. However, we would ask you to include in the EIS what PMRF is doing to reduce the amount of waste generated, specifically on how waste such as recyclables, organics, and construction and demolition wastes are reduced and/or diverted from the landfill and how PMRF is promoting a circular economy.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Waste minimization, recycling and green waste composting are incorporated by the Navy and NASA when possible in order to minimize the quantities of solid waste generated at PMRF. Disposal procedures, solid waste, and waste management are discussed in Section 3.12 (Hazardous Materials and Waste) of the Draft EIS. Additionally, the Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS.	Hazardous Materials and Waste
43	Ruta Jordans	Zero Waste Kauai	2	Please consider the following issues in the EIS: The Kekaha Landfill is due to be full in the next two to six years. Making less	Disposal procedures and waste management are discussed in Section 3.12 (Hazardous Materials	Hazardous Materials and Waste

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				trash or diverting usable materials would extend the life of the landfill. Zero Waste Kauai has consulted with PMRF in the past on diversion opportunities, specifically for organics, but, to our knowledge, no action has been taken. Diversion of organics (food waste and green waste) from the landfill to composting eliminates the production of methane in the landfill and produces a soil amendment which holds water and makes more nutritious soil. PMRF has a large population of residential and commuting personnel, which produces much usable food waste. According to https://www.defense.gov/News/News Stories/Article/Article/612710/ Pentagon officials said that climate change is a security risk because it degrades living conditions, human security and the ability of governments to meet the basic needs of their populations. It is obvious that the risk is even bigger for islands in the middle of the Pacific Ocean. Recycling helps combat the climate crisis by limiting the use of raw materials and reducing waste going into landfills. https://www.colorado.edu/ecenter/2023/12/15/impact-recycling-climatechange" How will the EIS address these issues? Ruta Jordans, Zero Waste Kauai President, zwknow@gmail.com	and Waste) of the Draft EIS. Section 3.12 also describes the Site Sustainability Plan that applies to waste at Main Base leaseholds and easements.	
44	Maria Walker	n/a	1	Aloha, I am strongly in favor of Option 3 in the plan for the future of the properties currently being used by the Navy and	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your	General Opposition, Socioeconomics,

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				NASA. The history of military presence in Hawaii has clearly shown that the US government has no respect for the land, water, or people of Hawaii; that they are willing to exploit natural resources with impunity and leave behind toxic waste that they refuse to clean up; that they desecrate historical and cultural sites with no consideration for this place, and that they occupy these lands while paying no reasonable taxes or rent for them. The coast at Mana should be open and free for residents and visitors to use, and the rest of the west side land needs to be saved for agriculture. I strongly support the Navy and NASA vacating the lands they are using, cleaning them up thoroughly, and returning the properties to their natural condition before they were developed. i do not believe there are any positives for our residents, visitors, or island land and waters in continuing to have this military presence on Kaua'i. Thank you for reading my comment.	participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). The EIS has been prepared consistent with the U.S. and State of Hawaiʻi's environmental regulatory framework.-Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	Biological Resources, Land Use and Access
45	James Trujillo	n/a	1	Aloha, I recommend the 3rd option- allow the lease to expire and return the land to the state and the people of Hawai'i The demilitarization of Hawai'i, while supported by some but opposed by most, is a modern day reality in our post colonial world. As America struggles with it's white supremist past, the peoples of the Pacific will continue to seek balance and harmony with the natural world. This will be made possible by taking the first steps	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies) in the Draft EIS. The EIS has been prepared consistent with the U.S.	General Opposition to Navy, Land Use and Access, Cultural Practices

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				in decommissioning the PMRF along with other military installations and facilities in the state. Reconsolidation of military operations in the state and limited to O'ahu is the next step in de-occupying Hawai'i. Mahalo for considering this testimony on the draft EIS for PMRF & KPGO. Again, I favor the 'No Action' option and encourage you to look favorably on Option 3 With respect and aloha, James Gerard Trujillo Makaleha, Kapahi, Kaua'i	and State of Hawaiʻi's environmental regulatory framework. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
46	Kevin Houck	n/a	1	Hi, Please reopen and remove restrictions to coastal access of the entire mana shoreline for coastal access for surfing, Kayaking, canoeing, fishing, walking, horseback riding and cultural practices. The pmrf guest card program is a great program that provides some access to some of the shoreline but it does but provide access to all of the areas that are recognized as public shoreline by the State of Hawai'i set forth in Hawai'i Revised Statutes Chapter 205 a Coastal Zone Management (attached) regarding the public access right to coastal areas. There are still several miles of ka moaena hohola o mana that are not accessible. Thanks for your time and stewardship of this area, and have a nice day. Aloha, Kevin	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted travel and access to Waiapuaʻa Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 (Cultural	Land Use and Access, Cultural Practices, General support

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					Practices) and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. Section 1.7.4 (Intergovernmental Coordination) of the Draft EIS describes how the Navy is coordinating with State of Hawaiʻi Office of Planning and Sustainable Development, Planning Division under the Coastal Zone Management Act.	
47	Steve Parsons	Kauai Climate Action Coalition, Kauai EV, Surfrider, Kauai Board of Realtors	1	Aloha EIS Team, While I understand this is just the beginning of the EIS process, I also get, at a high level, that we as a species have a very short window of time to decarbonize our world before unmanageable tipping points are crossed leading to UNIMAGINABLE Climate Chaos! Kauai is one of the Crown Jewels of our planet regarding natural beauty, ecosystems that provide life to us, and it is under massive assault! Conversely, It is also an example of what can be done to fight climate change Faster than anyone thinks possible. Our power coop KIUC, went from about zero renewable energy about 20 yrs ago to about 60% today with plans to 100% RE within 10 yrs. Great, now we just need to electrify everything ASAP to eliminate all fossil fuel burning on Kauai. In fact, Kauai Climate Action Coalition along with the Surfrider Foundation Kauai Chapter, and Zero Waste Kauai are launching an	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. The team also thanks you for providing the uniform resource locator (URL) to the article regarding Kūpono Solar at Joint Base Pearl Harbor-Hickam. The Proposed Action and scope of analysis for this EIS is described in Chapters 1 and 2 of the Draft EIS. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development.	Transportation

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				#ElectrifyKauai campaign in July that we'd like PMRF to possibly collaborate on, but at a minimum we are asking PMRF to join and promote this campaign. Imagine, PMRF and KPGO to be the first in the nation to go all electric faster than anyone thought possible. We ask that you go really big in your thinking and brainstorm how you can unleash millions of Green Infrastructure dollars to accelerate the electrification of Kauai. Like the solar battery array you did with KIUC and AES, but BIGGER!!!! Perhaps like what joint base Hickam just launched last week. .https://cleantechnica.com/2024/06/14/powering-10000-homes-ameresco-celebrates-the-commercial-operations-of-kupono-solar-at-joint-base-pearl-harbor-hickam/	A detailed discussion about policies, Best Management Practices (BMPs), and other methods employed within the Project Area to protect natural and cultural resources can be found in Section 2.5 (Best Management Practices) in the Draft EIS. As described in Sections 1.3 (Background) and 3.4 (Biological Resources) of the Draft EIS, a number of Readiness and Environmental Protection Integration (REPI) projects in the vicinity of the project area are focused on mitigating risk to these resources and the base's military mission. PMRF has invested in renewable energy. The PMRF Solar Photovoltaic (PV) Park encompasses 140 acres and generates 70 megawatt-hour (MWh) electricity and supplies enough clean energy to power 6,000 households. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMMs pertaining to Socioeconomics (EMM-4, development and continuation of the One Kauaʻi Hui) and the	

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					management of Water Resources (EMM-5, establishment of a Kaua'i County Water Working Group) are outlined and discussed in the Draft EIS.	
47	Steve Parsons	Kauai Climate Action Coalition, Kauai EV, Surfrider, Kauai Board of Realtors	2	In the meantime, use Hawaii grown Biodiesel from Pacific Biodiesel for everything that is diesel to see an immediate 85% reduction in air pollution! As a former Gulf war vet that has 50% service related disability for serving in a war for Oil, would encourage the Department of Defence to look at fast electrification as a national defence strategy, a financial cost saver and climate mitigation plan including harding infrastructure all in one! Lastly, be wary of the s-curve like acceleration of ever worsening effects of climate change. For example, we have had approximately 1ft of SLR (Sea Level rise) in the last 80 yr. the next ft. is projected to come in the next 30 yrs., the next in 20...etc. However, there are wildcard variables our there like Thwiaites Glacier https://www.sciencefocus.com/planet-earth/doomsday-glacier-prevent-flooding will raise seas 2ft alone and then will allow another 10 ft of rise to release from all the ice it's damming. This could happen in decades, not centuries. So the sense of urgency that needs to be deployed ASAP cannot be understated.	A table summarizing predictable environmental trends is introduced in Section 3.1.2 of the Draft EIS. Each resource section in the Draft EIS includes a discussion of predictable environmental trends including sea level rise, rising temperatures, change in precipitation, increased frequency/intensity of extreme weather events and ocean acidification.	Sea Level Rise, Transportation
47	Steve Parsons	Kauai Climate Action	3	Here is what we are doing and we implore you to Join Us in the Electrify Kauai	Thank you for your comment.	Proposed Action

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		Coalition, Kauai EV, Surfrider, Kauai Board of Realtors		Campaign, by doing so you will aggressively attack your greenhouse gas emissions. Below is a draft of our #EK campaign. Please pardon any typos/grammatical errors as this draft is being launched on our website with QR code sign ups in early July. https://www.kauaiclimateactioncoalition.com/ #ElectrifyKauai A Big Mahalo for stopping by and learning how you can help fight against climate change and save money and the Aina by joining the #ElectrifyKauai Campaign! The scientists at UH (University of Hawaii), like Chip Fletcher, tell us we need to stop burning all Fossil Fuels ASAP and electrify Everything everything Why Electrifying Everything Is Not Just For Elites - CleanTechnica to avoid the worst effects of the Climate Crisis that is harming Kauai in so many ways: Increased drought, Wildfire risk like Maui, Massive Rain events causing historic flooding way more often like Kauai's 2018 floods, Losing our Native Birds due to a warming climate that allows mosquitoes to reach higher elevations, Sea Level Rise taking our beaches, our precious Coral Reefs are undergoing local and global mass bleaching events from record ocean heat and ocean acidification, and many more! Now the good news… By clicking the "Join Us" button your are taking ACTION and deciding to choose Clean-locally produced Electricity over dirty imported Fossil Fuels		

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				for your Transportation, in your Homes and businesses by Switching to Heat Pumps For Hot Water and Clothes drying, and by using electrical yard equipment, and battery backup Power banks instead of air polluting gas generators. The #EK campaign is an honor system and you choose when and how you switch. This is simply a resource to help you get there, faster than you think possible. Furthermore, we are not into climate-shaming around here. What we are into is Cleaner Air, Cleaner Oceans and by taking the following actions for your home and business, YOU are making a big difference! And a little more good news, most of the suggestions below have a significant money saving benefit including tax rebates. A complete resource on how to Go Electric and pay for it can be found at Rewiring America Now Join Us by going Electric in the following areas. #1 Go Electric with your transportation choices EVs (Electric Vehicles) Like Electric Cars Trucks to E-Bikes and E-Scooters. Many rebates available making Some nice EV's are now 10k less of the avg. car price (https://cleantechnica.com/2024/04/12/tesla-model-y-model-3-cost-10000-less-than-average-new-car-price/) and cost way less in charging costs and maintenance. https://advocacy.consumerreports.org/wp-content/uploads/2020/10/EV-TCO-Overall-Fact-Sheet-FINAL-3.pdf or do your		

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				own ICEV (Internal combustion engine Vehicle) Vs EV comparison to see how much you can save per yr here: https://chooseev.com/savings-calculator/ #2 For Hot Water Heating Choose Heat HPHWH (Heat Pump Hot Water Heaters) Electrify government buildings, homes and businesses by promoting Heat Pumps!!! Here's a funny locally made video to show how heat pumps work: Hawaii Energy - "Heat Pump" (2022) (caveat on the Video $500 rebate comes from KIUC for us) Usually, they are less than half the cost of solar hot water heaters. Fun efficiency Fact, If you switch out a reg.electric HWH with a HPHWH, you will save enough Electricity to power you car: https://cleantechnica.com/2023/10/06/a-heat-pump-water-heater-will-save-all-the-electricity-youll-need-to-power-your-electric-vehicle/ Think about how much time and money you could save by Going Electirc and keeping all that money on Kauai instead of sending it off island. If you rent, share this info with your landlord and direct them to this site. #3 If you can't hang your clothes to dry, Choose a Heat Pump Clothes Dryers! (Some examples https://www.homedepot.com/b/Appliances-Washers-Dryers-Dryers-Electric-Dryers/Heat-Pump/120-volt/240-volt/N-5yc1vZc3q1Z1z17j86Z1z17ja4Z1z1dtqi?NCNI-5&sortby=price&sortorder=asc&onDisplay		

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				=false # For Cooking...Go INDUCTION, Baby! Induction appliances are up to three times more efficient than gas stoves, and up to 10% more efficient than conventional smooth top electric ranges. This improved efficiency performance can result in lower energy costs as well as lower rates of air pollution associated with energy generation Induction stoves are also free of the indoor air pollutants that come from gas stoves: burning gas for cooking produces nitrous oxides (NOX), carbon monoxide (CO), and formaldehyde (HCHO), which can have negative health effects and exacerbate respiratory conditions. According to a 2022 study, 12.7% of current childhood asthma in the United States is attributable to gas stove use. .May 11, 2023 https://www.energy.gov/articles/making-switch-induction-stoves-or-cooktops #4 Electrify Tools and Yard equipment and get rid of the smelly gASS Powered ones. Americans use ~800 million gallons of gas per year mowing their lawns, producing tons of air pollutants. Lawn equipment emissions went largely unregulated until the late 1990's. As a result, they emit high levels of carbon monoxide, volatile organic compounds and nitrogen oxides, and produce up to 5% of the nation's air pollution More info and examples of how other areas of the country are making the switch fast can be found here: https://bedford2030.org/the-health-		

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				benefits-of-switching-to-electric-lawn-equipment/ #5 Electrify Food Trucks and street vendors and businesses/home power back up with Battery Backup systems that continue to fall in price and can be charged with solar. https://electrek.co/2023/10/23/food-trucks-are-switching-out-dirty-gas-generators-with-this-zero-emissions-option/ This is the right course of action for Cleaner Kauai and serves as a shining example to the world of what can be done and we believe Faster than anyone thinks possible and residents and visitors immediately start enjoying the benefit of Cleaner Air and Oceans! Everyone wants Clean Air! Check out the TOP TEN Benefits of Joining Electrify Kauai Campaign (*In no particular order) #1 Save Money Personally (Electricity is Cheaper than gas from EVs to Heat Pumps there are so many ways to Save! # Kauai County, Businesses and nonprofits Save money #3 Cleaner Air! Fossil Fuel Kills millions of people a yr: https://www.theguardian.com/environment/2023/nov/29/air-pollution-from-fossil-fuels-kills-5-million-people-a-year by By choosing electricity you are choosing cleaner air. #4 Cleaner Oceans! Surfers and Water people love their EVs, because they love the Ocean and fossil fuel pollution causes Ocean acidification that is killing our corals and other marine sea life along with ocean heatwaves: What is		

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				Ocean Acidification? #5 Feel good about doing your part for the next generations by acting now to mitigate the worst effects for them. https://climatecommunication.yale.edu/publications/distress-about-climate-change-and-climate-action/ #6 GOOD, Local Green Jobs are created when we go Electric.		
47	Steve Parsons	Kauai Climate Action Coalition, Kauai EV, Surfrider, Kauai Board of Realtors	4	In Fact, training for this is being expanded at Kauai Community College so residents can train for a great profession! Electrical Installation and Maintenance Technology | Kauai Community College #7 EVs can also support grid and via bidirectional charging as well as be a backup power source for 1st Responders, Businesses and homes: https://cleantechnica.com/2023/10/13/electric-vehicles-play-a-surprising-role-in-supporting-grid-resiliency/ EV Charging And The Grid — The Truth Is Out There - CleanTechnica #8 This will eventually help to fight inflation by lowering demand for oil and gas and thereby prices! Ironically, this also helps folks that cannot yet afford or acquire an EV, by lowering gas prices. #9 Help Kauai continue to be a shining example to the world of how to be environmentally Pono! In a not too distant past.. Kauai's power generation was about 99% from burning fossil fuels to over 57% year round renewable energy today, and targeting 100% by 2033. This was accomplished faster than anyone thought	Thank you for your comment and the information you provided about solar panels.	Proposed Action

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				possible and we will electrify Kauai faster than anyone thought possible, All this can happen, but only with your help, so Join us now! "Pledge Button Here"! End of Example... Please Act boldly to fight climate change!!! Mahalo, Steve Parsons, Lead for Kauai Climate Action Coalition and Kauai EV, Surfrider Foundation outreach team, Kauai Board of Realtors Green Real Estate & Sustainability committee Chair, Hanapepe Kauai 808-6513232c REALTOR® Broker, RB-22077 kwBig Island | RB-23793		
48	R. Chong	n/a	1	Support: Alternative 1 - Extend Leases. Alternative 2 - Fee Simple Acquisitions. Disagree with Leaving Hawaii.	On behalf of the Navy and NASA, the EIS team thanks you for your comment. The alternatives are described in additional detail in Chapter 2 of the Draft EIS.	General Support
49	Keala Heanani Carter	n/a	1	None of the three alternatives reflect the change of attitudes towards the environment, frontline communities and limited land and water resources reflected in Hawaii today versus Hawaii in 1965. Using Alternative 2 as a more extreme option to make the continuance of another long lease occupying massive acreage, reflected in Alternative 1 seem reasonable is not a sincere effort to provide real alternatives. Instead, it creates a sham choice between alternatives like 1 and 3 that are obviously very improbable politically. Instead of using the Alternatives 1 and 3 to push people in the direction of Alternative 2, offering some real "alternatives" to the	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). As described in Chapter 2, the alternatives analyzed in the Draft EIS were developed to meet the screening criteria and purpose of and need for the Proposed Action. Alternative 1 describes securing new real estate agreements to continue the same activities in the same areas	General Opposition, Alternatives, Land Use and Access, Socioeconomics

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				status quo and incorporating the environmental justice guidance of the Biden Administration could offer the community the chance to participate in the future of PMRF and the Kokee Observatory in a transformative way and also restore some of the trust lost from the Red Hill crisis. The community of the West Side of Kauai, particularly Kekaha, is distinct and has different values and needs that many of the other communities on the island. It is already an area disproportionately saddled with industry with less access to a variety of employment. In today's climate, an alternative that considers benefit to the immediate communities living near the base, and consulting with them to articulate community benefits, which could include job training or apprenticeships, access to the cultural sites on the base and more investment in the frontline community and environmental remediation and enhancement, would signal that the Navy and NASA realize things are different now and want to consider ways to balance occupying such a huge section of land and limiting public access, with equity as a counterbalance. The renaming of the beach was a nice gesture but didn't signify the type of substantive change needed in this lease renewal. It is important to consult closely with local organizations and Native Hawaiian Organizations to	that the Navy and NASA are currently using. Analysis of the No Action Alternative (Alternative 3) is included in the Draft EIS consistent with state and federal legal and regulatory requirements. Potential effects to socioeconomics are included in Sections 3.6 of the Draft EIS. Executive Order 14148 "Initial Rescissions of Harmful Executive Orders and Actions" (90 FR 8237) revoked prior executive orders requiring the analysis of Environmental Justice concerns under NEPA. Therefore, an Environmental Justice discussion is not carried forward as a resource section in the DEIS. Potential effects to access from the Proposed Action are discussed in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS. Ongoing coordination with cultural practitioners, lineal descendants, and Native Hawaiian Organizations (NHOs) is described in Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS. Chapter 5 (Mitigation and Enhanced Management Measures) describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to	

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				understand what the communities of West Kauai consider important instead of just pushing for another extremely long lease that pretends things are equal to what they were in the 1960s. The vast majority of people with the higher GS jobs are not from West Kauai and creating additional pathways into employment for folks nearest would both cut down on the gas of the many contractors driving in from Kapaa and elsewhere and allow one of the lowest per capita income neighborhoods in the State an opportunity to train for skilled, tech jobs. The current administration has published several Executive Orders on Environmental Justice initiatives and it would be refreshing to see the Navy and NASA demonstrate they are embodying these priorities and looking to avoid the mistakes very fresh on locals' minds.	implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders.	
50	Ruta Jordans	Kauai EV	1	Thank you for this opportunity to discuss environmental issues on PMRF. Please apply whatever is appropriate for Kokee also, such as electric transportation. We are concerned about the large number of commuters driving back and forth, many even coming from the north and east of Kauai, with most driving ICE (internal combustion) vehicles. I happened to be in the Waimea Visitors Center one afternoon when PMRF let out, about 4pm. There seemed to be a never- ending stream of cars. I have also been on base and discovered the long distances from one	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Navy and NASA work to support actions to reduce greenhouse gas emissions and protect natural resources. Section 3.10 (Air Quality and Greenhouse Gases) of the Draft EIS includes a discussion of potential effects to air quality and greenhouse gas emissions. Additionally, each resource chapter in the EIS contains	Air Quality and Greenhouse Gases, Transportation

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				part of the base to the other. Therefore we would like you to consider ways to lower the green house gas emissions from all those vehicles. Is there a charging infrastructure on base to encourage commuters to get electric vehicles (EVs)? Perhaps investigate an electric bus system to transport to and from PMRF to the east or north side - depending on how many people commute from there. Do you have those figures? PMRF could also have an inter-base electric bus system to reduce green house gas ICE driving within PMRF as well as up to Kokee.	a table summarizing predictable environmental trends. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The area of analysis includes the leaseholds and easement lands as described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS. Electric bus systems and other similar and/or related projects are outside the scope of this EIS.	
51	Claire Tonry	n/a	1	Dear Ms. Kerry Wells, I comment to express some of my concerns with the PMRF and KPGO (hereafter collectively referred to as "PMRF") NEPA scoping process. The two action alternatives currently proposed for consideration in the EIS are too similar, especially as to their impacts on the human environment. Additional, more distinctive action alternatives need to be considered in detail in the draft EIS	On behalf of the Navy and NASA, the ESI team thanks you for your comments and appreciates your participation. In Chapter 3 of the Draft EIS, the Navy and NASA analyze how the permanent loss of state land through fee simple retention differs from retention through non-permanent mechanisms such as leases, etc., and identify effects to these land retention mechanisms in the Draft EIS. Consideration of how these mechanisms could be received by the public, in the unique historic	Alternatives

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					context of the affected environment, are analyzed in Section 3.5 (Land Use and Access) of the Draft EIS. Chapter 2 of the EIS discusses the selection process for the alternatives, including the alternatives considered but not carried forward for detailed analysis. during this alternatives screening process, options of a shorter duration lease and not renewing current easements were analyzed. However, these alternatives did not support the requirements of Purpose of and Need for the Proposed Action and were dismissed. Table 2-2 in the Draft EIS describes the screening factors used to select the action alternatives.	
51	Claire Tonry	n/a	2	Such additional alternatives should include meaningful conservation measures for Mānā, Kōke'e and other affected areas, such as adding a conservation easement component to the expiring easements in renegotiations. The industrial pesticide and bioengineering research and development by multinational chemical manufacturers that is currently occuring under the exisiting easements is the source of significant toxic pollution which threatens local communities and state and federally protected rare and endemic species. The Navy should evaluate alternatives that ensure that agricultural use of the areas	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Chapter 2 of the Draft EIS includes a description of Alternatives 1 and 2 as well as other alternatives that have been considered but dismissed. The process for identifying alternatives is	Alternatives, Land Use and Access, Biological Resources, Hazardous Materials and Waste, Air Quality and Greenhouse Gases

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				under Navy easements is no longer counterproductive to the federal agencies' responsibilities under the Endangered Species Act and their own regulations to, inter alia, protect and recover listed species. Further expanding the Kawai'ele Bird Sanctuary (or similar reserve complex) should be examined across the action area for the same reason. The alternatives analysis should also include different approaches to reduce and eliminate the need for the Navy's overreliance on dirty diesel generators.	described in Section 2.2 of the Draft EIS. The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities conducted by Kekaha Agricultural Association (KAA) and Agribusiness Development Corporation (ADC) are described in cumulative analysis (Chapter 4 of the Draft EIS). A history of land use in the Project Area is included in Section 1.3 (Background) and Section 3.5 (Land Use and Access) of the Draft EIS. Potential effects to public health and safety from the Proposed Action are described in Section 3.9 and potential effects from hazardous materials and waste are described in Section 3.12 of the Draft EIS. Sections 1.3.6 (Environmental Management and Stewardship) and 4.1 (Introduction to Analysis) the Draft EIS also address the present and future Readiness and Environmental Protection Integration (REPI) Programs including promoting regeneration of	

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					historic wetland habitat for endemic and endangered Hawaiian waterbirds on the Mānā Plain. As described in Section 3.7 (Water Resources) of the Draft EIS, water monitoring on PMRF land (Mānā Plain) occurs quarterly (at a minimum), and all results are publicized via the ADC website, dating back to 2020 (https://dbedt.hawaii.gov/adc/manaplain/). Potential wetland areas containing native and non-native vegetation and federally protected waterbirds are present on PMRF lands.	
51	Claire Tonry	n/a	3	A revised scoping notice and the draft EIS should also examine how a broader range of alternatives would each interact with planned, foreseeable, proposed, and needed development and restoration on Mānā and surrounding areas, including: the West Kaua'i Energy Project (as may be revised); infrastructure for Department of Hawaiian Homelands use; water diversions to support instream flows; groundwater use restrictions and needs; siting and construction of a new landfill; the ongoing need for pollution control improvements to the Mānā ditch system; and Kaua'i's acute need for affordable housing. It is difficult to comment on the scoping materials'summary of best management practices because these activities are not	See response to comment #2 regarding alternatives. Under Alternatives 1 and 2, there are no proposed changes to the type or frequency of current activities occurring on Navy and NASA-held leasehold and easement lands. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities. As required by Hawai'i Environmental Policy Act (HEPA) and National Environmental Policy Act (NEPA) regulations, the project had one scoping period to invite the public to comment on the Proposed Action, identify issues and possible	Alternatives, Cumulative Effects, Existing Operations

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				well-quantified, and it is unclear which activities pertain to the leased and easement lands. Please reissue the materials with these clarifications for further public comment. Thank you for your consideration. /s/ Claire Tonry	alternatives. Another comment period will follow publication of the Draft EIS. Chapter 4 of the Draft EIS includes a list of past, present, and reasonably foreseeable future projects including the West Kaua‘i Energy Project and infrastructure maintenance as well as analysis of potential cumulative effects of these projects in combination with the Proposed Action.	
52	Rosalyn Cummings	n/a	1	Addition to correspondence I would like to request for data on water: in the US NAVY and NASA contracted area(s) Water amount usage, water quality, drainage, and maintenance Along with data on the archeology surveys, with updated information on na Iwi kupuna ancestral bones (remains) found. If a FOIA, or UIPA needs to be submitted please be as transparent as possible Along with including the federal, state, and county laws that are being used. In protection of our cultural heritage; hahai holoholo na, kahua, mahi’ai, lawai’a, mo’omeheu, mea ho’olako, and many more. Waiwai is our wealth as na kanaka, kanaka oiwi, po’e kanaka, kanaka maoli It is our natural resources, nutrients of which nourishes aina kino, imprints, and much more .	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Section 3.7 (Water Resources) of the Draft EIS includes relevant details regarding usage, drainage, and maintenance on the leaseholds and easements lands. Section 3.2 (Archeological and Architectural Resources) includes information regarding archeological surveys in the region of influence (ROI) for the project. Section 3.3 (Cultural Practices) of the Draft EIS includes a discussion of cultural practices within the region of influence for the project. Section 1.7.5 (Ongoing Community Coordination) of the Draft EIS includes reference to ongoing coordination with Native Hawaiian Organizations (NHOs) regarding discoveries of human skeletal	Water Resources, Archaeological and Architectural Resources, Cultural Practices

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				Wai is also very important to me Mahalo, Manawaiakea	remains, ongoing coordination with NHOs on construction of Lua Kupapaʻu O Nohili (Nohili Burial Crypt), and ongoing coordination for repatriation. Information on how to submit a Freedom of Information Act (FOIA) request can be found at https://www.cnic.navy.mil/About/Freedom-of-Information-Act/. For other resources, please refer to the documents section on the PMRF KPGO EIS (www.pmrf-kpgo-eis.com). Relevant laws and regulations are provided in a table in Appendix E and also located through the Draft EIS in associated sections.	
52	Rosalyn Cummings	n/a	2	ATTN: PMRF and KPGO RE; EIS Project Manager, Ms. Kerry Wells 400 Marshall Road, Building X-11 Pearl Harbor, HI 96860 MEMORANDUM From: Roslyn Nicole Manawaiakea Malama mare Cummings: Under Duress Kalaheo Ahupua'a, Moku O Kona, Kaua'i Mokupuni a Hawaiian Organization - U.S.DOI EMAIL: 315), Kalaheo, Hawaii, 96741, in the Hawaiian Islands mana.eolakakouhawaii@gmail.com SPECIAL Attention: File to the Current Director / CEO / CFO/ District Manager only Not General Processing TMK (1)9-9-001:000 (1)2-002-013-0000 is hereby request, and that a copy be furnished/transmitted to all participants for proof of title (chain of title) concurrent	Appendix C of the Draft EIS includes the original real estate documents for the Proposed Action.	Land Use and Access, Relevant Laws and Regulations

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				to County Tax/Bureau of Conveyances Bureau examines, records, indexes, and digitizes over 344,000 Regular System and Land Court documents and maps annually; issues Land Court Certificates of Title. Kauai County Code, Real Property Assessment Division's purpose is to assess all properties within the County of Kauai, which means, to provide accurate, uniform and timely assessment information; maintain the update ownership information; create and revise tax maps for all of Kauai's properties annually. "alleged" Industrial; Conservation NON-TAXABLE status Government: USA C/O NAVAL FACILITIES ENGINEER CMD ATTN: RE CONTRACTING OFFICER, AM1 258 MAKALAPA DR STE 100 PEARL HARBOR HI 96860 3121		
52	Rosalyn Cummings		3	The United States, State of Hawaii, County of Kauai Agents and Agencies own Oath to uphold U.S. Constitution, Laws and Treaties, makes them legally LIABLE through 42 USC §1983 for VIOLATIONS of the 1949 Geneva IV, 1907 Hague Conventions IV, USC 5 §1331, USC 18 §956, §957, §1623, §1651, §1652, §1653, §1660, §1661, §1091, §2441, §1654, Article 1 §8 and Article 6 §2 of the United States Constitution that are being committed here in the Hawaiian Islands / Sandwich Islands by use of: 1) (TMK) Tax Map Key Numbers to identify Location	Comment noted. The EIS has been prepared consistent with the United States (U.S.) and State of Hawaiʻi's environmental regulatory framework.	Land Use and Access, Relevant Laws and Regulations

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				2) (TMK) Tax Map Key Numbers to determine Title 3) (TMK) Tax Map Key Numbers to collect Taxes 4) (TMK) Tax Map Key Numbers to retain Jurisdiction over Internationally Protected Persons and Internationally Protected Property 5) (TMK) Tax Map Key Numbers to Pillage, Destruct, and Appropriate Protected Persons and Private Real Property not needed by Military Necessity 6) (TMK) Tax Map Key Numbers to authorize the carrying of deadly weapons such as Small Arms and Light Weapons. Therefore, committing the act of PILLAGING, DESTRUCTION AND APPROPRIATION under Rules of War 1949 Geneva IV under 18 U.S. CODE §2441 and Violating his Majesty the King of the Hawaiian Islands Kamehameha III 1850 self executing ratified Treaty with the United States of America under U.S. Constitution A rticle 1 §8 and under U.S. Constitution Article 6 §2.		
52	Rosalyn Cummings		4	Agents and Agencies mentioned above must comply and are subject to Kamehameha III Treaty, Constitution, Laws, Civil and Penal Codes of the Hawaiian Islands once within three miles from the low water mark near the shore of the Hawaiian Islands.	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations
52	Rosalyn Cummings		5	That a confirmation of the Hawaiian Islands, Hawaiian Kingdom in continuity, nation-state status as a Neutral Power	See response to comment #3.	Land Use and Access, Relevant

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				(May 11, 1854), be confirmed by the U.S. Department of the Navy (DOD) (U.S. Constitution Art. 6. Sec. 2 Treaties...supreme law of the land….", as the paramount guideline document, governing the conduct and mutual obligations of belligerents and neutrals regarding the "proposal" under consideration. That, the Neutral Power status of the Hawaiian Kingdom, precludes the U.S. Department of Defense (DOD), Dept. of the Navy from obtaining entry in to the Hawaiian Islands by way of the U.S. Federal Constitution Corporation, aka STATE OF HAWAII (SOH), Municipality TMK (tax map key - keyed only with no determination of ownership), whereby illegalities arise under the U.S. Constitution Art. 4. Sec. 3, "New States...no new states may be erected". That, the U.S. Corporation aka STATE OF HAWAII, officially exists only within the 10 mile square of Washington D.C. as permitted under the District of Columbia Act of 1887. That, the SOH adopted the U.S. Federal Constitution (Admiralty, Maritime, Equity), and therefore is already attached to the Consultor , i.e. U.S. Dept. of the Navy, as part of the administering authority, as a municipal and civilian militia, under GENEVA IV, and as such, any participant(s) thus far, who are attached, or function in any way, by or under the authority of the SOH or its Municipalities, MAY NOT UNDER ANY CIRCUMSTANCES		Laws and Regulations

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				be empowered to give CONSENT. That is how Section 106 Consultations are carried out in"Indian country", where consultation does not imply that consent is automatically given. That, the U.S. DOD recognize that "The Apology Law" U.S. Public Law 103-150, 23 NOv. 1993, Pres. W. J. Clinton, HAS NO FORCE OF LAW IN THE HAWAIIAN ISLANDS, but only within the contiguous territory of the 48 United States of America,, and cannot be lawfully used by the US DOD, as an automatic right of entry into the neutral territory of the Hawaiian Islands, currently under U.S. "belligerent" occupation, nor can the US DOD, impose any distinction, exclusion, limitation or restriction upon the neutrals of the Hawaiian Kingdom in continuity, by way of its Corporation aka State of Hawaii, that discriminates, in any way, against the Kanak Maoil, whose "national origins", and vested rights in property and natural resources are perpetual and inherent, under the Hawaiian Laws promulgated in 1841-1842, by His Majesty Kamehameha III, Lahainaluna, Maui. nor their Power and Duties a a neutral nation-state in continuity.		
52	Rosalyn Cummings		6	It is to be understood that, ALL State of Hawaii AGENCIES, or persons or organizations operating under that entity, under color of law or color of statute, doing business in the Hawaiian Islands, are to be considered as consultants to the US DOD Dept. of the Navy, and ARE	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				CONFLICTED OUT, and DO NOT POSSESS THE AUTHORITY TO GIVE CONSENT to the "proposal" under consideration. Furthermore, the location of the proposed activities, by way of a SOH Municipal 'tax map key, keyed only for the purpose of location and taxation, but with "no determination of' ownership, CANNOT BE USED TO INFER OR IMPLY ANY TRANSFER OF THE TITLE TO THE TERRITORY OF THE HAWAIIAN KINGDOM, HAS EVER LAWFULLY OCCURRED, under the U.S. Constitution or the norms of customary international law.		
52	Rosalyn Cummings		7	Although the US Corp. State of Hawaii controls and disposes of the lands and resources within our neutral territory, any parties being of na kanaka descent, or having national origins" in the Hawaiian Kingdom automatically have availed themselves of their neutral status, power and duties, if those persons are a part of any agency or organization of the US Corp. SOH, and they shall be, considered as part of the Belligerent occupation force on land, as articulated in the provisions and prohibitions of GENEVA IV (US 1907 - THE HAGUE), for the purpose of, and in conjunction with this consultation under the U.S. NHPA. For the purpose of this consultation, the terms and conditions of GENEVA V, GENEVA V Chapter 14, the 1955 REVISED LAWS OF HAWAII, dictate the proper protocols, authorities, and entities that are empowered to ensure	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				protection for the " prehistoric and historic properties"CERTAIN RIGHTS OF THE PEOPLE - HAWAIIANA, under the Hawaiian Laws, and Hawaiian Kingdom Flag, second only to the Stars and Stripes of the U.S. that flies over the Hawaiian Islands neutral territory as the flag of a Belligerent, defined in GENEVA IVLaws and Customs of War on Land, and its Annex Regulations Concerning the Laws and Customs of War on Land (U.S. 1907 - THE HAGUE) - (See: "The Apology Law" "...act of war against a friendly nation….", in violation of the U.S. War Powers Act, and international treaty violation US Constitution Article 6. Sec. 2) since Jan. 17, 1893, as that infamous act constituted a military insurrection in support of a coup demain.		
52	Rosalyn Cummings		8	FAILURE TO COMPLY WITH THE PRESENT TERMS , CONDITIONS, AND OBLIGATIONS SPECIFIED IN US DOD DIRECTIVE ON CONSULTATION UNDER SECTION 106 OF THE US NHPA VALIDATES THE CONTINUATION OF THE ONGOING CRIMINAL CONSPIRACY TO ILLEGALLY MAINTAIN CONTROL OVER THE HAWAIIAN ISLANDS & ARCHIPELAGO. As per the terms and conditions of the May 11, 1854 Hawaiian Kingdom (Hawaiian Islands), signing of the "Declaration of Accession to the Principles of Neutrality", and for the purpose of this "Consultation" shall be applicable: RIGHTS AND DUTIES OF NEUTRAL POWERS AND PERSONS IN	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				WAR ON LAND (HAGUE) (1907-THE HAGUE, U.S. Senate advice and consent on March 10, 1908, U.S. Presidential ratification on Feb. 23, 1909, Entered into force on January 26, 1910, Proclaimed by the President of the United States on February 28, 1910, 36 stat.2310; Treaty Series 540 - Convention Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land), as follows; CHAPTER I - Rights and Duties of Neutral Powers. Article 1. The territory of neutral Powers is inviolable. Article 2. Belligerents are forbidden to move troops or convoys of either munitions of war or supplies across the territory of a neutral power. Article 10. The fact of a neutral power resisting, even by force, attempts to violate its neutrality cannot be regarded as a hostile act. CHAPTER III Neutral Powers (The nationals of a State which is not taking part in the war are considered neutrals.) Article 17. A neutral cannot avail himself of his neutrality: a - "...commits hostile acts against belligerent; b - "...commits act in favour of a belligerent, or by enlistment. Article 18. "...acts...not...considered as committed in favour of onebelligerent" b - Services rendered in matters of police, or civil administration.		
52	Rosalyn Cummings		9	CHAPTER IV - Compensation shall be paid...in proportion to the material used, and the the period of usage. \ NOTE: Under the Provisions of Article 22.	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				Notification - To the Netherlands Government that the territory of Hawaiian Kingdom in continuity, is under U.S. "Belligerent" occupation as of Jan. 17, 1893, by an "act of war", U.S. President Grover Cleveland, before the Congress of the United States, requesting for notification to all other Powers of the Hawaiian Islands status as a "neutral territory", under international law. In closing, i strongly recommend a review of these un-precidented circumstances that have arisen during thee NHPA Section 106 Consultations by the U.S. NAVY, (AS PART OF CINCPAC Headquarters), regarding the imposed use of U.S.National Historic Preservation Act (NHPA) in the "noncontiguous territory" (U.S.Public Law 99-239 Compact of Free Association Act of 1986 - Title II - Pacific Policy Reports), of the Hawaiian Islands, by reason that the U.S. Corporation aka STATE OF HAWAII CAN ONLY EXIST WITHIN THE 10 MILE SQUARE OF WASHINGTON D.C., THEREFORE THE USE OF THIS FEDERALLY CONSTITUTED CORPORATION TO IMPOSE U.S. LAW IN HAWAII IS A CONSTITUTIONAL VIOLATIONS UNDER ARTICLE 1 SEC. 8, ARTICLE 3. SEC. 8,, ARTICLE 4. SEC 3,. AND ARTICLE 6. SEC. 2. THE QUESTION ARISES AS REGARDS TO, BY WHAT CONGRESSIONAL AUTHORITY OR EXECUTIVE ORDER IS THE U.S. DOD CLAIMING TO HAVE AUTHORITY TO OCCUPY THE NEUTRAL TERRITORY OF THE		

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				KINGDOM OF HAWAII AND CONDUCT MILITARY TRAINING OPERATIONS.BY WAY OF U.S. LAW? IN SHORT, IS THE CONSULTATION PROCESS A TROJAN HORSE.FOR THE U.S. INDUSTRIAL MILITARY COMPLEX WHICH IS IN COMPLICITY WITH, AND HIDING BEHIND THE CONSTITUENT ELEMENTS OF THE 'ILLEGALLY PROCLAIMED PROVISIONAL GOVERNMENT THAT COMMITTED ACTS OF TREASON ON JANUARY 17,1893? The foregoing comments conclude my submissions for the record of the consultations with the U.S. Department of the Navy, under the U.S. National Historic Preservation Act, Section 106, relating to the protection of historic places and properties, and the Hawaiian Kingdom accession to GENEVA Convention V concerning the RIGHTS AND DUTIES OF NEUTRAL POWERS AND WAR ON LAND, (US 1907, HK 1854). Respectfully submitted for inclusion into the minutes of the April 30, 2018 meeting in Honolulu.		
52	Rosalyn Cummings		10	NOTE: On 2 SEPTEMBER 2018, additions, corrections and clarifications to the original text sent to Capt. Rasmussen USN, in charge of consultation proceedings have been made and are included in this text to be forwarded to Sy Heen Shim, in his capacity as a "protected person under international law, as a descendent of the "Chiefs and People" of the Hawaiian Islands, under Hawaiian Law, promulgated	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				1841-1842 Kamehameha III, Lahainaluna, Maui.		
52	Rosalyn Cummings		11	As a matter of law the government officials in the Hawaiian Islands, being part of the People/citizenry of the United States political subdivision aka State of Hawaii, under the adoption of the U.S Federal Constitution, have sworn an oath "to support and defend" both the United States and state of Hawaii constitutions, which requires them to ensure the native tenants due process of law, the effect of which has been for decades that the State and counties have allowed the destruction of hundreds if not thousands of Hawaiian village sites and "places of worship" throughout the islands, often to support private, and for profit land developments, at times by so-called "Emergency Proclamation'' that inadvertently deprive civil liberties; in correlation to the unlawful enforcement of policies of apartheid by distinction, exclusion, restriction and limitation, based on national origin, race, color, religion and ethnicity, by way of the term "native Hawaiian'' meaning any descendant of not less than one-half part of the blood of the races inhabiting the Hawaiian Islands previous to 1778, who is then subject to the right of the (US)State of Hawaii via Section (7), ARTICLE 2. Hawaiian Homes Commission sub section 201, to the right of the State of Hawaii, by way of the 1978 Constitutional Convention and election of	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				November 7, 1978, to hold the unfettered ability to "regulate" fundamental human liberties of "subsistence" as well as their "cultural and religious" practices, constituting a "Deprivation of rights under color of law, under Title 18 U.S. Code sub-section 242, Deprivation of vested property rights held by native tenants under color of law, under /title 18, U.S.Code Section 241, lending to a Deprivation of due process under the color of HRS (Hawaii Revised Statutes 708.814.5, perpetrating a long-term pattern and practice of "Genocide" through selective enforcement of law, under Title 18 U.S. Code sub-section 1091, Chapter 50AGENOCIDE.		
52	Rosalyn Cummings		12	CONSTRUCTIVE NOTICE is, also, filed regards to the "purpose(s)" of H.B. 2693, in respect for "Native and Part-native" Inhabitants, so situated within the physical maritime and territorial boundariesof the Ahupuaa (District) Moku, Mokupuni, being a part of the Royal Domain of the Hawaiian Kingdom Monarchy, with interests restricted, and subject to the reservation of rights affirmed in 1839 by His Majesty King Kamehameha III, which are included as being part of "Hawaiian National usage", by Her Majesty Queen Liliuokalani on November 25, 1892, (the "crown land" title carries certain specific terms and conditions, i.e. the fee-simple interest is "inalienable", and "private", (the United	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				States Congress in 1993 affirming the unlawful seizure of the "crown lands" by the Republic of Hawaii, and transfer to the United States as "without the consent of or compensation to…their sovereign government…".), and "subject to the rights of tenants…", and who never "voluntarily surrendered…rights in the National lands…", and who are "protected persons", in accordance with the FOURTH (IV) GENEVA CONVENTION (US Signatory 1907 - HAGUE, and the (ICCPR) International Covenant on Civil and Political Rights, Adopted by United Nations (UN) General Assembly Resolution 2200A (XXI) of 16 December 1966 entry into force 23 March 1976, UN Charter.in accordance with Article 49, being upheld under the United States Constitution Article 6, Section 2., per the RLH 1955 - Volume I, Chapter 14, sub Section 14-8 Powers and duties, "Any law to the contrary notwithstanding…", being consistent, and in conformity with United States policy relating to U.S.C. TITLE 16 - CONSERVATION, PART A -Historic Preservation Programs		
52	Rosalyn Cummings		13	NOTICE is hereby given with respect to a request FILED 5 FEBRUARY 2024, for assistance/discretion of the United States Secretary of Interior to determine "that a major aspect of a State program is not consistent" with United States Code TITLE 16 - Part A - Historic Preservation Programs, currently under administration,	See response to comment #3.	Land Use and Access, Relevant Laws and Regulations

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				within the non-contiguous Pacific area of the Hawaiian Islands, due to the absence of a Historic Preservation Review Commission as required, under USC TITLE 16, in order to properly qualify, certify and oversee the certification of historic preservation programs, of any municipality acting as a "local government" including the State of Hawaii, in order to effect compliance with the "requirement of equal footing" per USExec.P. 3309, and RLH 1955 - Volume I, Chapter 14, sub Section 14-8 Powers and duties, "Any law to the contrary notwithstanding…,		
52	Rosalyn Cummings		14	in order to be consistent in regards to the administration of "Historic Preservation Programs", under U.S.C. Title 16 - CONSERVATION, Part A, within the "State system", in lieu of: A. The complete absence of an actively functioning, effective and sufficiently qualified Historic Preservation Review Commission, within the current State system, being administered in the, non-contiguous Pacific area of the Hawaiian Islands, as required to properly qualify, certify and oversee any "local government", including the "State of Hawaii" in the administration of Historic Preservation Programs, per Sec. 470-1(b-A (b) -2 (B), having given rise to: 1. widespread disruption, irreparable destruction, desecration and defiling of historic sites, cultural properties and places, throughout the Hawaiian Islands;	See response to comment #3. Additionally, sections 1.3.6 (Environmental Management and Stewardship), 1.7.5 (Ongoing Community Coordination), 2.5 (Best Management Practices), 3.2 (Archaeological and Architectural Resources), and 3.3 (Cultural Practices) of the Draft EIS describe the Navy and NASA's ongoing commitments to coordination with the Native Hawaiian community, as well as cultural resource management and protection.	Land Use and Access, Relevant Laws and Regulations

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				2. disregard for family honors, rights (burials); the endangering of the lives of persons, their private property, religious sites, interference with and disregard for religious convictions and practices; 3. acts forbidden, unauthorized and malicious methods of seizure, pillage, and destruction, lending to the willful contamination and destruction of watersheds, groundwater reservoirs wetlands, rivers, forests, historic irrigation systems, estuaries and agricultural estates; 4. destruction, desecration, defiling, mutilation and molestation of institutions dedicated to religion, charity, education, the arts and sciences, being acts that are normally "forbidden", under the Fourth IV Geneva Convention, Respecting the Customs and Laws of War on Land, and its Annex Regulations Concerning the Customs and Laws of War on Land, which should be made the subject of legal proceedings; 5. neglect on the part of the "United States, its political subdivision State of Hawaii, Municipalities and its People" to effect compliance with regard to the "equal footing" requirement of the U.S. Executive Proclamation 3309, Pres. Dwight D. Eisenhower (1959), by blatantly undermining, disregarding, avoiding and continually failing to implement and put into effect administrative structures necessary to comply with the purpose and stipulations		

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				in the Revised Laws of Hawaii 1955, Volume I, Ch. 14,		
52	Rosalyn Cummings		15	CERTAIN RIGHTS OF THE PEOPLE - HAWAIIANA, Sections 14-1 thru 14-11, being representative of the "chief governing authority"; a) having brought about conditions intended to bring about the destruction of the group, as a whole and in part, b) having caused a near complete collapse of the indigenous economy, identity and way of life, in correlation to the unlawful enforcement of policies of apartheid by distinction, exclusion, restriction and limitation, based on national origin, race, color, religion and ethnicity, by way of the term "native Hawaiian" meaning any descendant of not less than one-half part of the blood of the races inhabiting the Hawaiian Islands previous to 1778, who is then subject to the right of the State of Hawaii via Section (7), ARTICLE 2. Hawaiian Homes Commission sub section 201, to the right of the State of Hawaii, by way of the 1978 Constitutional Convention and election of November 7, 1978, to hold the unfettered ability to "regulate" fundamental human liberties of "subsistence" as well as their "cultural and religious"practices, constituting a "Deprivation of rights under color of law, under Title 18 U.S. Code sub-section 242, Deprivation of vested property rights held by native tenants under color of law, under /title 18, U.S.Code Section 241, lending to a	See responses to comments #1 and #3.	Land Use and Access, Relevant Laws and Regulations

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				Deprivation of due process under the color of HRS (Hawaii Revised Statutes 708.814.5, and a long-term pattern and practice of "Genocide" through selective enforcement of law, under Title 18 U.S. Code subsection 1091, Chapter 50A - GENOCIDE.		
52	Rosalyn Cummings		16	CC: United States Department of Interior Honorable Secretary, Deb Haaland Attention: U.S. Department of Interior, Solicitor General 1849 C. Street, N.W. Washington D.C. 20420 United Nations, Human Rights Committee, Geneva, Switzerland To: DEPARTMENT OF THE NAVY Commander United States Pacific Fleet 250 Makalapa Drive Pearl Harbor, Hawaii 96860-3131	Comment noted.	Land Use and Access, Relevant Laws and Regulations
52	Rosalyn Cummings		17	SUBJECT; concerning Consultation on the "proposal to continue military readiness activities in the Hawaii Training and Testing Ground (HSTT) Study Area."effects of undertakings in Hawaii, pursuant to Section 106 of the National Historic Preservation Act (36 CFR Ss800), for proposed training, testing and readiness activities located within TMK: (1)9-9-001:000*, in order to "identify historic properties, potential impacts, assess possible effects, and seek ways to avoid, minimize or mitigate any adverse effects on historic properties." Dear Sir, You may, or may not, be aware of the historical fact that on May 11, 1854, His Majesty King Kamehameha the Third (III), by way of His	Consultation for the Hawaii-California Training and Testing (HCTT) Project is outside the scope of this EIS.	Land Use and Access, Relevant Laws and Regulations

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				Exc. Robert C. Wyllie signed the "Declaration of Accession to the Principles of Neutrality" as requested by a U.S. President. As such, the Hawaiian Kingdom, "...territory of neutrals is inviolable.", and the peace and security of our Hawaiian Kingdom (a nation-state in continuity), and the world for that matter, has come into question, due to the lack of international recognition of the Hawaiian Islands as a neutral territory under belligerent occupation (Attachment A) in addition, there are related matters concerning our Maritime Jurisdiction, as a Neutral Power, lying within one marine league (three miles), from the coast of each of our islands (Hawaii-U.S. Convention of May 16, 1854), out to the 200 Mile EEZ, in respect for the protection and hospitality of our ports, harbors and roads, equally extended to all belligerents, so long as they respect our neutrality. In the context of this consultation, as a neutral hors de combat, "historic properties" are defined as, the entire territory belonging to the Hawaiian Kingdom, under belligerent occupation. It is my goal, under this obligation, lest I avail myself of my neutrality, to define the extent of our powers and duties with respect to the conduct of belligerents, and ensure compliance with the terms pertaining to neutrality, and fulfill our mutual obligations and responsibilities as Parties to the Convention, towards the		

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				protection of historic properties to enhance and maintain peace and security throughout the Hawaiian Islands, Hawaiian Archipelago Respectfully submitted, Manawaiakea a Wahine Maoli, (per June 17,1897, letter of protest filed by HRM Queen Liliuokalani, at U.S. State Department Domiciled in the Hawaiian Islands, as Part of the Polynesian Triangle		
53	Lauren Stovall	n/a	1	Aloha kākou, As a concerned resident and Native Hawaiian, I support the "no action" option to not renew the lease for the land that the military is currently occupying as the Pacific Military Range Facility. My concerns are as follows: 1. The Navy has not done their due diligence in advertising necessary information to the community. 2. The Navy is not allowing the community to speak as a group so that we may hear each other's views.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and H in the Draft EIS). Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to	EIS Process

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					the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
53	Lauren Stovall	n/a	2	3. The Navy is hosting the genocidal Israeli Defense Forces during RIMPAC and training them to continue to murder innocent civilians in Gaza with impunity.	Rim of the Pacific (RIMPAC) Exercise is outside the scope of this EIS.	General Opposition to Navy
53	Lauren Stovall	n/a	3	4. The Navy has restricted access to Nohili (Barking Sands) to Native Hawaiians for cultural purposes such as gathering foods, medicines, lei materials, and spiritual and mental health practices. 5. The Navy has not disclosed which Native Hawaiian Organization has approved its Cultural Impact Assessment.	As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted travel and access to Waiapuaʻa Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. As described in Sections 1.7.5 (Ongoing Community Coordination) and 3.3 of the Draft EIS, PMRF	Cultural Practices, Land Use and Access

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					regularly facilitates access for cultural practitioners. Detailed discussions about cultural practices in the region of influence (ROI) are discussed in Section 3.3 (Cultural Practices), and the Cultural Impact Assessment (CIA) is included in Appendix F. The CIA includes details of interviewees, including their affiliations and biographies. Chapter 5 (Mitigation and Enhanced Management Measures) of the Draft EIS describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina.	
53	Lauren Stovall	n/a	4	6. The community wants far more transparency in how the military is caring for the environment. For example: the impact on marine life and surrounding human communities caused by missile testing, and the safety and soundness of fuel storage containers. For these concerns, and more- I strongly recommend the "no action" option to NOT renew this lease. Sincerely, Lauren Kamalei Stovall	The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which	General Opposition to Navy, Water Resources, Biological Resources, Hazardous Materials and Waste, Public Health and Safety

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					includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The scope of this EIS encompasses land-based leaseholds and easement lands; therefore, marine resources are not covered in the scope of this EIS. Potential effects from the Proposed Action to marine resources, including the endangered monk seal and sea turtle that utilize the terrestrial region of influence (ROI), are described in Section 3.4 (Biological Resources) of the Draft EIS. Prior National Environmental Policy Act (NEPA) documents analyze PMRF testing and training activities to resources, including the 2018 Hawaii-Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS) and the 2022 Point Mugu Sea Range EIS/OEIS. The HSST can be found on the EIS website at https://pmrf-kpgo-eis.com. Potential effects to public health and safety and hazardous materials and waste are addressed in Sections 3.12 (Hazardous Materials and Waste) and 3.9 (Public Health and Safety) in the Draft EIS.	
54	Joan Heller	n/a	1	It's time to discontinue the training of killing other beings, along with the	On behalf of the Navy and NASA, the EIS team thanks you for your	General Opposition to

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				destruction of Earth's global water, air and land resources! With the historical American mindset towards global military dominance, funded through tax-payer/voter funds, you turn-the-tide I, a Kauai resident	comments and appreciates your participation. The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Potential effects to resources from the Proposed Action are included in Chapter 3 of the Draft EIS. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state.	Navy, Biological Resources, Water Resources
54	Joan Heller	n/a	2	needs to begin with dis-mantling It's time to discontinue the training of killing other beings, along with the destruction of Earth's global water, air and land resources! With the historical American mindset … … turn-the-tide and close the Mana base	The Navy is committed to complying with environmental laws and regulations. The Sikes Act requires military installations to develop and implement a comprehensive plan for natural resource conservation and management. PMRF maintains an	General Opposition to Navy, Biological Resources

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				by rescinding your lease renewal! I, a return Kauai resident (post-WW2 generation) has learned about the violent nature of the colonial American (Euro-centric) culture!	Integrated Natural Resources Management Plan (INRMP) that is updated regularly; the 2023 PMRF INRMP is available to the public and can be found on the EIS website at https://pmrf-kpgo-eis.com. The INRMP serves as a repository for natural resource information, provides guidance on how PMRF is to meet compliance requirements, and sets management goals, required actions, and resources necessary to protect and manage the installation's natural resources. Chapter 5 (Mitigation and Enhanced Management Measures) describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the 'āina. Specifically, EMM-3 outlines the Navy's commitment to provide the public with annual wildlife summaries, including status updates and data reports and research studies.	
54	Joan Heller	n/a	3	American militaristic training is antithetical to all life…the armed-forces leadership is out-of-control as is the	Comment noted.	General Opposition to Navy

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				President and most of Congress! Down-grade Military Industry, Joan Yamamoto		
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	1	Historical and Cultural Context Public Law 103-150 recognizes two key facts: (1) the importance of land to Kānaka ʻŌiwi, and (2) as a condition of the Admissions Act, public trust lands of the Hawaiian Kingdom were to be held by the State for, among other things, "... the betterment of the condition of Native Hawaiians." Further, Public Law 103-150 finds, in relevant part, "Whereas, the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum; Whereas, the health and well-being of the Native Hawaiian people is intrinsically tied to their deep feelings and attachment to the land" (P.L. 103-150 1993). This historical context must inform all analysis of the social and cultural impacts of the proposed action.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. A history of land use is included in Sections 1.3 (Background), 3.2 (Archaeological and Architectural Resources), and 3.5 (Land Use and Access) of the Draft EIS. This history is included as context for the National Environmental Policy Act (NEPA) and Hawaii Environmental Policy Act (HEPA) analysis and decisions to be made regarding the Proposed Action.	Land Use, Cultural Practices, Biological Resources, ESA Species, Air Quality and Greenhouse Gases, Water Resources, Visual Resources
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	2	Purpose and Need Statement The Navy / NASA Environmental Impact Statement (EIS) is an improper instrument for guiding the State of Hawaiʻi's decision making about public trust lands The Navy and NASA, as petitioners, and the State, as trustee for the lands in question, have fundamentally different interests and obligations. As the	As described in Section 1.1 (Project Introduction and Overview) of the Draft EIS, the EIS has been prepared by a third-party contractor consistent with National Environmental Policy Act (NEPA) and Hawaiʻi Environmental Policy Act (HEPA) laws and regulations. Board of Land and Natural Resources	EIS Process, Land Use and Access, Relevant Laws and Regulations, Purpose and Need for the Proposed Action

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				petitioner, the Navy and NASA have a conflict of interest with regard to their roles as the sponsors of the EIS because they have an interest in downplaying adverse impacts on State lands. The State on the other hand, has a trust obligation to protect the land and environment, including cultural resources, especially on Hawaiian Trust Lands (i.e. "Ceded Lands"). The State cannot make a responsible decision about these lands without considering its own land management obligations and what care the land requires. Thus, the State must conduct its own planning process to determine the best stewardship practices for the lands at Nohili and Kōkeʻe. In the case Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case, Judge Gary Chang ruled: Public trust lands are state-owned lands that are held for the use and benefit of the people in general of the State of Hawaii. The State of Hawaii is the trustee of these public lands in the public trust. The trustee of the public lands trust has the highest duty to preserve and maintain the trust lands. This duty is broadly coined in the concept of "malama 'aina"—to care for the land. (Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case 2018) Therefore, the State's primary duty is to mālama ʻāina.	(BLNR), as the accepting authority (under Hawaiʻi Administrative Rules [HAR] Section 11-200.1-28), will evaluate whether the applicant-prepared EIS fulfills the intent of Hawaiʻi Revised Statutes (HRS) Chapter 343 and will consider HRS Title 12, Chapter 171 (Hawaiʻi's law governing management and disposition of public lands). A description of existing conditions and potential effects from the Proposed Action to archaeological and architectural resources and cultural practices are discussed in Sections 3.2 and 3.3, respectively, of the Draft EIS.	

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55	Kyle Kajihiro	Ethnic Studies, University of Hawai‘i at Mānoa	3	The issue at the core of the purpose and need statement in the EIS must be the responsibility as lessee to care for the land as defined by the terms of the lease. In the case Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case, Judge Gary Chang ruled: Public trust lands are state-owned lands that are held for the use and benefit of the people in general of the State of Hawaii. The State of Hawaii is the trustee of these public lands in the public trust. The trustee of the public lands trust has the highest duty to preserve and maintain the trust lands. This duty is broadly coined in the concept of "malama 'aina"—to care for the land. (Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case 2018) Therefore, the Navy and NASA as lessees are governed by the terms of the lease and easements to mālama ‘āina. The purpose and need statement must be rewritten to reflect this duty to clean up and restore the land it leases from the state. The court has found that Navy and NASA activities have caused environmental damage in violation of the terms of the lease and that the State has a duty to enforce the terms of the lease consistent with the principle of mālama ‘āina (care for the land).	Sections 1.3.6 (Environmental Management and Stewardship), Section 2.5 (Best Management Practices), and descriptions of ongoing operations on leaseholds and easement lands in Chapter 3 of the Draft EIS demonstrate the Navy and NASA’s efforts to manage and conserve natural and cultural resources. Additionally, Chapter 5 (Mitigation and Enhanced Management Measures) of the Draft EIS describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ‘āina. The Navy and NASA coordinate with the Department of Land and Natural Resources (DLNR) regarding lease conditions, and copies of the current real estate agreements are included in Appendix C. Potential effects to land use and access are discussed in Section 3.5 in the Draft EIS. The purpose and need statement accurately reflects the Navy and NASA’s purpose and need for the Proposed Action.	Purpose and Need for the Proposed Action

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					Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	4	Compliance with the terms of the lease or easement agreements Provide a list of and reports for all site inspections conducted by the Department of Land and Natural Resources of the State lands and seas leased or encumbered by easement by the Navy. This is important to know whether the State has been fulfilling its trust obligations for these public trust lands.	DLNR conducts monitoring and inspections of the Navy and NASA leaseholds and easement lands. Solicitation of past DLNR monitoring and inspection records at PMRF should be made directly to DLNR. Appendix F contains cultural resource investigations such as archeological surveys at PMRF and KPGO and the Cultural Impact Assessment (CIA), conducted in support of this Draft EIS. Appendix M contains natural resource surveys at PMRF and KPGO conducted in support of this Draft EIS. A wetland delineation was conducted in support of this Draft EIS and can be found in Appendix N.	Proposed Action
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	5	Alternatives Statement In line with the purpose and need to mālama ʻāina, the preferred alternative should be based on this obligation. The	The Draft EIS includes a description of purpose and need for the Proposed Action (Section 1.4) as well as the alternative selection process	Alternatives

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				alternatives analyzed must include analysis of conducting the proposed actions elsewhere. Please provide all alternatives studies conducted by the Navy for the proposed actions.	(Section 2.2). According to these criteria, Sections 2.3 (Alternatives Carried Forward for Detailed Analysis) and 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS identify the alternatives. Chapter 3 of the Draft EIS analyzes the potential effects for these alternatives carried forward for detailed analysis. Chapter 1 (Purpose of and Need for the Proposed Action) explains the activities conducted at PMRF are considered essential to the national security interests of the United States (U.S.). The Navy would potentially need to relocate and continue these activities at some other location, given the dramatic reduction in capabilities at PMRF because of the loss of the state lands. At present, identifying where and how these testing and training needs could be accommodated—and the consequences and impact analysis of such a scenario—would involve a complex planning, budgeting, and acquisition program that is speculative and beyond the scope of this EIS.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	6	Affected Environment Defining the scope of the affected environment requires analysis that extends beyond the immediate region of	The region of influence (ROI) or area of analysis is defined for each resource in the Draft EIS and summarized in Section 3.1.2 (Effects	Affected Environment, Cultural Practices,

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				influence (ROI) along temporal and spatial axes. Temporal Scope: Environmental effects of past, present, and foreseeable future activities: In order to provide an accurate assessment of environmental impacts for proposed actions, an EIS must begin with a thorough understanding of the baseline and current ecological and cultural conditions of the affected site. Baseline conditions at Nōhili and Kōkeʻe are the environmental conditions which existed prior to military use of the land. A reasonably accurate picture of baseline conditions can be determined by extrapolating from historical records, oral histories, cultural, archaeological, and geophysical studies, and biological studies of relatively intact native ecosystems in neighboring areas which have similar environmental conditions. Understanding current environmental conditions at Nōhili and Kōkeʻe requires a comprehensive study of the cumulative environmental effects of all past military activities at these sites as well as the activities of other land uses, such as commercial agriculture and genetically modified crops. This study must consider effects of the proposed action that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including how the proposed action may compound	Analysis). As described in Section 3.1.2, the ROI is the geographic area that could be impacted by the Proposed Action, and the geographic extent is determined by the degree of effect (i.e., the physical reach of any impact on the resource). Within Chapter 3 of the Draft EIS, the affected environment sections describe the current environment (as shaped by historical impacts), and the environmental consequence sections summarize impacts from ongoing activities and identify potential effects from the Proposed Action and alternatives. The methodology for this analysis is included in Section 3.1 (Introduction to the Affected Environment and Environmental Consequences) of the Draft EIS. Additionally, Chapter 4 of the Draft EIS describes past, present, and reasonably foreseeable actions relevant to cumulative effects and analyzes the cumulative effects potentially resulting from the interaction of the Proposed Action with other actions. The cumulative impact analysis includes agricultural use of lands managed by the Agribusiness Development Corporation (ADC) and Kekaha Agricultural Association (KAA).	Archaeological and Architectural Resources, Biological Resources, Cumulative Effects, Land Use and Access

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				or increase the adverse effects of past military activities.		
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	7	Spatial Scope: Region of Influence (ROI): The geographical scope of analysis, or region of influence (ROI) must include environmental effects of proposed military activities on all lands within the installation boundaries, the neighboring areas, as well as more distant sites which are operationally linked to the proposed action and affected environment. According to the Hawaiʻi Military Land Use Master Plan (See Figure 1), the Navy has nine leases and easements on Kauaʻi that expire between 2028 and 2030. These include anOcean Right of Way Lease totalling 7680 acres of ocean space, and a 1,167 acre lease on Niʻihau, as well as leaves and easements on Mahaka and Miloliʻi ridges. These leases and easements should be included in the scope of analysis.	The region of influence (ROI) for each resource is described in Section 3.1.4 (Effects Analysis). The status of the ocean right-of-way (ROW) is described in Section 1.1 (Project Introduction and Overview) of the Draft EIS. Section 1.3.5 (Navy and NASA Use of State Lands) and Appendix D include a description of areas included in the analysis. Niʻihau is not a part of the Proposed Action and is therefore not analyzed in this EIS. Mākaha and Miloliʻi Ridges are a part of the Proposed Action and are, therefore, analyzed in this EIS.	Project Area, Area of Analysis
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	8	Land Use The EIS should incorporate a complete history of land title and land use with maps. A central issue is the Navy and NASA's use of public trust lands (also known as "ceded lands"). The status of these lands are unique in that they are held in trust for a number of public purposes defined by the Statehood Act. The EIS should explain the decision making process, with relevant documentation, for the initial negotiation and approval of the leases and easements.	Detailed discussion of the history of land tenure and land use currently on the leases and easements within the region of influence (ROI) is described in Section 3.5 (Land Use and Access) of the Draft EIS. Twenty percent of ceded land revenue (fees from the leases and easements) goes first to the Office of Hawaiian Affairs (OHA), and the rest to the Special Land Development Fund as required by law.	Land Use and Access, Proposed Action

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55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	9	State Land Use Regulations: The EIS must analyze the land use zoning and permitting requirements.	Detailed discussion on land use and zoning can be found in Section 3.5 (Land Use and Access) of the Draft EIS. Required federal and state permits are discussed in Appendix E.	Land Use and Access, Consistency with State and Local Government Plans and Policies
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	10	Cultural Resources To date, investigations into the number and significance of cultural sites have been superficial. The EIS should include a thorough inventory of the historic sites in the area, discussion of the cultural significance of Nohili and Kōkeʻe, in relation to the larger cultural landscape, and a discussion as to how the condition of these sites has changed while the Navy and NASA has used these lands. Kānaka ʻŌiwi and the general public currently only have limited access to the affected parcels, and therefore, are denied the right to fully enjoy and conduct cultural, religious, or subsistence gathering practices until the lands are cleaned up and restored.	Detailed discussion of archaeological and architectural resources is included in Section 3.2 and description of cultural practices is included in Section 3.3 of the Draft EIS. These sections also include analysis of potential effects from the Proposed Action to these resources. Appendix F contains cultural resource investigations such as archeological surveys at PMRF and KPGO and the Cultural Impact Assessment (CIA), conducted in support of this Draft EIS.	Archaeological and Architectural Resources, Cultural Practices
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	11	The EIS must incorporate a comprehensive Cultural Impact Assessment (CIA). Pursuant to the Hawaiʻi Environmental Policy Act (HEPA), and Articles IX and XII of Hawaiʻi State Constitution government agencies are required "to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups" (Guide to the Implementation and	A summary of results from the Cultural Impact Assessment (CIA) is included in Section 3.3 (Cultural Practices), and the full CIA is included as Appendix F of the Draft EIS. If deemed necessary, Department of Land and Natural Resources (DLNR) will conduct a Ka Paʻakai analysis.	Cultural Practices

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				Practice of the Hawaii Environmental Policy Act, 2012, 11). The CIA must include an analysis of adverse cultural impacts on Kanaka ʻŌiwi and other cultural practices by military activities at Nohili and Kōkeʻe which have occurred in the past, and which may occur in the future as a result of proposed military activities. The DEIS must incorporate a rigorous Kapaʻakai analysis of the proposed actions, which must include, (1) the identity and scope of "valued cultural, historical, or natural resources" in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area; (2) the extent to which those resources-- including traditional and customary native Hawaiian rights-- will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken by the LUC to reasonably protect native Hawaiian rights if they are found to exist. (Ka Pa`akai O Ka`aina v. Land Use Commission, 94 Haw. 31. 2000. 36)		
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	12	Cultural Landscapes: The CIA must consider the entire connected cultural landscape including ocean and mountain spaces. Hawaiʻi law recognizes that in addition to built structures, a cultural resource may also be a natural feature of the landscape, such as a mountain, hill, rock, tree, stream, or animal which has cultural significance to Kānaka ʻŌiwi. This	Methodology used to prepare the Cultural Impact Assessment (CIA) followed Office of Environmental Quality Control (OEQC) guidelines for CIA and are complying with Act 50 provisions in Hawaiʻi Revised Statute (HRS) 343. The methods used were targeted toward providing the state with information	Cultural Practices

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				study should include an in-depth cultural landscape study (CLS) and ethnographic survey (ES). The Papakū Makawalu methodology, developed by the Edith Kanakaʻole Foundation, would be appropriate to employ in the assessment of the cultural meanings and significance of the affected area. Identify and discuss the significance of place names. Analyze the relationships between geographic features and moʻolelo. Analyze how contemporary cultural practices may be affected by the proposed actions.	needed to fulfill Article IX Sec. 7 obligations through Ka Paʻakai analysis. The methods were developed and carried out by two kanaka ʻoiwi cultural scholars/researchers who developed and used methods they considered to be culturally appropriate. The study considers the landscape within a large region of influence (ROI) that includes the entire Mānā Plain and the pali and ridgetops behind it, including the physical and spiritual geography.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	13	Cultural Sites and Resources: Affected sites include, but are not limited to alanui (trails), ahu and heiau (shrines and temples), puʻu (hills), rocks, caves and lava tubes, plants and animals used in traditional healing, hunting grounds, sites for harvesting birds, sites for observation and study of celestial bodies, burial sites, quarries and workshops for tools, and sources of water. Discuss the significance of the sand dunes and wetlands. Discuss the significance of the westernmost orientation of this landscape for funerary spiritual practices.	See response to comment #10.	Cultural Practices
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	14	Cultural Practices: Pursuant to the Navy's and NASA's lease agreements, easements, and legal obligations, the Navy and NASA must mālama ʻāina to restore ola (life) and create a safe and healthy environment for the well-being of flora, fauna and all interdependent life forms including the	As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted	Cultural Practices

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				native tenants / hoa ʻāina / beneficiaries. The native tenants must include, but are not limited to: hunters, fishers, and gatherers, lāʻau lapaʻau (herbal medicine practitioners), cultural and religious/spiritual practitioners and their relationship to the ʻāina, surfers, canoe paddlers, oceangoing canoe voyagers, and hula practitioners. Adverse impacts on cultural practices include, but are not limited to restrictions on access due to security or safety restrictions, the destruction of cultural or religious sites, the destruction of environmental resources used in cultural practices, and the disruptions of the view plane and serenity of the area caused by missile launches, lasers, vehicle and aircraft noise, and smoke and dust. Conduct a comprehensive survey of past and current Kanaka ʻŌiwi cultural practicesin the ROI. Identify the cultural sites and resources needed for the revival and/or perpetuation of these cultural practices. What steps must be taken to improve the ability of Kānaka ʻŌiwi and the public to have safe, meaningful, and regular cultural access to these areas? How will the Navy and NASA increase the opportunities for Kānaka ʻŌiwi and the public to safely participate in mālama ʻāina (environmental and cultural restoration activities) in the ROI?	travel and access to Majors Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Chapter 5 (Mitigation and Enhanced Management Measures) of the Draft EIS describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders. Appendix F contains cultural resource investigations, such as archeological surveys at PMRF and KPGO and the Cultural Impact Assessment (CIA), conducted in support of this Draft EIS.	
55	Kyle Kajihiro	Ethnic Studies, University of	15	Biological Resources Native Ecosystems: The EIS must adopt an	Potential effects from the Proposed Action to cultural practices and	Biological Resources

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		Hawaiʻi at Mānoa		ecosystem-scale approach to analyzing the effects of the proposed military activities on the natural resources. This means studying the components, structures, and functioning of affected ecosystems. Individual species cannot be considered in isolation from their ecosystems. Nor can they be considered as separate from cultural relationships with humans. Ecosystems and species that inhabit them are also cultural resources for Kānaka ʻŌiwi.	biological resources are analyzed in Sections 3.3 and 3.4, respectively, in the Draft EIS. Appendix F contains cultural resource investigations such as archeological surveys at PMRF and KPGO and the Cultural Impact Assessment (CIA), conducted in support of this Draft EIS. Appendix M contains natural resource surveys such as vegetation and wildlife surveys, conducted in support of this Draft EIS. Independent of this Draft EIS, cultural and biological resources are conducted within the Project Area.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	16	Threatened and Endangered Species: It is imperative that all rare, threatened and or endangered organisms within the area remain protected. The EIS must incorporate a complete inventory of all rare, threatened and/or endangered plant, insect and animal species including those identified as Native Hawaiian ʻaumakua and kinolau (divine bodily manifestations of Hawaiian deities) within the ROI and neighboring areas which are likely to be affected by proposed activities. Affected species must include marine species that could be affected by military training associated with the facility.	See response to comment #7 regarding the region of influence (ROI). The scope of this EIS encompasses land-based leaseholds and easement lands; therefore, marine resources are not covered in the scope of this EIS. Exceptions to marine resources include endangered species, monk seals and sea turtles, that utilize the land ROI covered in the scope of this EIS. Affects to other marine resources are addressed in the Hawaii-Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS) (available on the PMRF KPGO EIS website, www.pmrf-kpgo-eis.com). Federally and state-listed species are discussed in the Section 3.4	Biological Resources

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					(Biological Resources) of the Draft EIS.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	17	Invasive Species: The EIS should fully disclose the extent of invasive species threats at the ROI. What is the inventory and extent of invasive species threats at Nohili and Kōkeʻe? What invasive species have been introduced or spread by military activities? For example, has the coconut rhinoceros beetle, fire ants, or other noxious weeds been detected in the base? What is the Navy and NASA doing to control these threats? Please provide any incident reports of damage to endangered species or habitats by invasive species. Please provide any incident reports of accidental releases or introductions of invasive species, such as: hitchhiking fountain grass or fireweed on vehicles or personnel or the introduction of invasive species such as fire ants, rodents, snakes, spiders, rhinoceros beetles as stowaways on cargo boats, vehicles, and aircraft.	Section 2.5 (Best Management Practices) of the Draft EIS includes the management strategies identified for invasive species in the 2023 PMRF Integrated Natural Resource Management Plan (INRMP). As stated in Section 3.4 (Biological Resources) of the Draft EIS, PMRF maintains an Invasive Species Management Plan to include, but not limited to, control and prevention of invasive species. Please refer to 2023 PMRF INRMP to see a complete list of invasive species managed and present on PMRF (available on the PMRF KPGO EIS website, www.pmrf-kpgo-eis.com).	Biological Resources
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	18	Wildfires: The EIS must provide a complete history of wildfires at PMRF and KPGO, including the dates, causes, extent of damage, and responses. How are wildfires documented, and where is this information reported and archived? What have been the impacts on fires to protected species and habitats? What have been the impacts of fires on cultural sites and resources? How have fire incidents affected the transformation of the ecology? How are biologists and	A copy of the PMRF Brush and Wildland Firefighting Department Internal Procedure is available on the PMRF-KPGO EIS website, www.pmrf-kpgo-eis.com. PMRF ensures that launch areas are maintained free of flammable vegetation and therefore have minimal fire potential, non-native areas are regularly mowed, areas adjacent to pads are pre-soaked with water prior to a launch, and fire and	Public Health and Safety

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				cultural resources specialists documenting the impacts of fires?	emergency service crews are present at every launch. Please see Section 3.9 (Public Health and Safety) of the Draft EIS for more detail. Additionally, the Fire Information for Resource Management System website located at https://www.earthdata.nasa.gov/data/tools/firms provides historic and current wildfire data throughout the United States (U.S.) including Hawaiʻi.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	19	Socioeconomics / Environmental Justice Environmental Justice Analysis: As mentioned above, the greatest environmental justice impacts will be borne by Kānaka ʻŌiwi who have the most profound connection to the lands in question. The environmental justice analysis in the EIS must not use demographic data to claim that there are negligible environmental justice impacts because all ethnic groups are considered minorities on Hawaiʻi island. The key considerations in determining environmental justice impacts include: Who has the longest history, deepest connections, and profound knowledge about Nohili and Kōkeʻe? Who has the greatest stake and is most directly affected by the environmental and cultural impacts there? Who has suffered the greatest historical injustice, cultural disintegration, and dispossession as a result of the history of the U.S.-backed	Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix. Impacts to Native Hawaiian cultural practices are analyzed in Section 3.3, based on direct consultation with knowledgeable Hawaiian cultural practitioners with generational ties to the Mānā Plain and the Project Area. The overthrow of the Hawaiian Kingdom and the U.S. military's involvement is discussed in the Draft EIS analysis of impacts to Land Use in Sections 3.5.1.4 (History of Ceded Lands in the ROI) and 3.5.2 (Environmental Consequences). Potential effects from the Proposed Action to socioeconomics are analyzed in Sections 3.6 in the Draft EIS. As summarized in Section 3.6, the significance of the adverse	Socioeconomics

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				overthrow of the Hawaiian Kingdom and the subsequent seizure of Hawaiian land by the federal government? Whose cultural practices are most adversely affected by Navy and NASA activities in Nohili and Kōkeʻe? Who is exposed to the greatest risk of exposure to toxins, injury, or death in the exercise of their cultural practices? How are subsistence hunters, laʻau lapaʻau practitioners, and Kanaka ʻŌiwi religious practitioners affected by the access restrictions and hazards at PMRF and KPGO?	socioeconomic effects for the No Action Alternative would depend on the number and timing of jobs eliminated at PMRF and KPGO as well as the size of spending reductions associated with these operational changes. All the jobs at KPGO would be lost under this alternative. As many of the employees at PMRF are contractors, they might be able to find employment at other locations on Kauaʻi. As a result, the potential reductions to Navy and NASA operations under the No Action Alternative would result in the loss of jobs at KPGO as well as other jobs associated with the potential loss of activities associated with leaseholds and easement lands. The activities that could be eliminated at PMRF and associated number of jobs that could be lost and is not known at this time; however, could be a significant loss to the local community. Therefore, adverse effects of the No Action Alternative to socioeconomics could be significant. Enhanced Management Measure (EMM)-2 (considering Cultural Practices), in Table 5.2-1 in the Draft EIS, discusses the continued access for subsistence, habitation, commercial activities, access issues,	

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					recreation, religious/spiritual activities, and customs.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	20	Economic Costs: Some questions about the economic impacts of the military activities: What are the costs of clean up and restoration of environmental damage caused by military activity? What is the depreciation in the land's value as a result of military activities? How does the loss of value adversely affect the general public and Native Hawaiians as beneficiaries of the public land trust? What are the opportunity costs? What economic value can be generated by restoring the ecological and cultural integrity of Nohili and Kōkeʻe?	See response to comment #3 regarding the No Action Alternative. See response to comment #19 regarding socioeconomics.	Socioeconomics
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	21	Noise Noise is one of the major complaints about military activities. The EIS should include consultations with residents of neighboring communities about the effects of noise. This includes the impact of noise from overflights of aircraft. How does noise affect the value of homes? How does it affect quality of life? What public health affects might be induced by chronic noise? How are veterans' mental health affected by the noise? How does noise affect the behaviors of animals, especially endangered species?	Potential effects from noise associated with the Proposed Action to wildlife are discussed in Section 3.4 (Biological Resources), and potential effects to humans are discussed in Section 3.9 (Public Health and Safety) of the Draft EIS.	Noise, Biological Resources
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	22	Air Quality The EIS must provide thorough data on air quality at PMRF. What kinds of documentation and reporting is conducted when there are incidents that	A detailed discussion on air quality can be found in Section 3.10 (Air Quality and Greenhouse Gases) of the Draft EIS, including current conditions and a summary of effects	Air Quality and Greenhouse Gases

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				may adversely affect air quality, such as a fire or training event? What emissions of air pollutants have been reported at PMRFand KPGO? What toxins or hazardous substances have been detected in airborne particulate matter during fires or training events?	from ongoing activities and potential effects from the alternatives analyzed. Additionally, each resource chapter in the EIS contains a table summarizing predictable environmental trends. Potential effects to public health and safety and hazardous materials and waste are included in Sections 3.9 and 3.12, respectively, of the Draft EIS.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawai'i at Mānoa	23	Water Resources Nohili and the Māna plain was known to be a site of abundant wetlands. How have military and associated agricultural activities in easement lands affected the wetlands of this area? What is the history and status of aquifers in the vicinity of Nohili? Where are the wells? What is the history of water usage? What has been the impact of past uses of aquifers? Rocket propellent has been associated with perchlorate contamination in many sites in the United States. Perchlorate has been detected in Nohili. What is the status of perchlorate contamination, and what is being done to clean up this hazard and prevent its release? Provide a comprehensive analysis of the PFAS contamination at PMRF and KPGO. Include incident reports of all releases, detections of PFAS in the water, soil, and biota, and the status of clean up efforts.	Potential effects from the Proposed Action are discussed in Section 3.7 (Water Resources) and Section 3.8 (Utilities) of the Draft EIS. The location of the Mānā Well, and a description of the pump capacity, is discussed in Section 3.7 and 3.8. A discussion on Nohili pump, aquifers within the region of influence (ROI), and perchlorate is discussed in Section 3.7. Although a comprehensive analysis of Per- and polyfluoroalkyl substances (PFAS) contamination at PMRF and KPGO is out of the scope of this EIS, the Navy is phasing out the use of PFAS in firefighting foams per the Environmental Protection Agency (EPA), and results from the 2024 Mānā Well water quality testing found that PFAS were found to be at undetectable levels (see the 2024 Mānā Water Well System Water Quality Report available on	Water Resources

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					the PMRF-KPGO EIS website, www.pmrf-kpgo-eis.com). Additionally, a copy of the PMRF Potable Water Sampling Operation and Maintenance Procedure can be found on the website. A wetland delineation on leasehold lands of PMRF was conducted in support of this Draft EIS (Appendix N).	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	24	Natural Hazards, Geology, and Soils What are the hazards due to climate change and sea level rise? What are the risks of tsunamis and hurricanes? What plans exist for preventing contamination of the environment in the event of flooding	A map showing the 3.2-foot sea level rise scenario is included in Section 3.1.2 of the Draft EIS, and predictable environmental trends (including sea level rise) are discussed in each resource section.	Sea Level Rise, Water Resources
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	25	Climate Provide a comprehensive audit of the fossil fuel use and carbon emissions of PMRF and KPGOfrom all sources, including but not limited to the emissions of offshore exercises, rocket launches, flights to and from the facility, ground transportation, and power generation.	Please refer to Section 3.10 (Air Quality and Greenhouse Gases) of the Draft EIS for analysis regarding emissions. Section 1.5 (Scope of Environmental Analysis) of the Draft EIS explains that the scope of this EIS encompasses land-based leaseholds and easement lands, and Navy and NASA's activities on these areas. Therefore, offshore exercises are outside the scope of this EIS.	Air Quality and Greenhouse Gases
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	26	Visual Resources Wide open spaces and views of the mountains is part of the significance of this landscape. What are the Kanaka ʻŌiwi visual resources in the ROI? What is the cultural significance of different view planes?	Potential effects to cultural practices from the Proposed Action are discussed in Section 3.3 (Cultural Practices) of the Draft EIS. Potential effects to visual resources from the Proposed Action are	Visual Resources, Cultural Practices

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					discussed in Section 3.13 (Visual Resources) of the Draft EIS.	
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	27	Public Facilities and Infrastructure What are the effects on the quality of roads? What are the impacts of military use of harbor facilities? How are military activities affecting recreational use of the beach, mountain, and ocean resources?	Potential effects to utilities and transportation networks from the Proposed Action are discussed in Sections 3.8 and 3.11, respectively, in the Draft EIS. Effects to recreational use are discussed in Sections 3.3 (Cultural Practices), 3.5 (Land Use and Access), and 3.7 (Water Resources) of the Draft EIS.	Utilities, Transportation
55	Kyle Kajihiro	Ethnic Studies, University of Hawaiʻi at Mānoa	28	Toxic and Hazardous Substances The EIS must include comprehensive information characterizing toxic and hazardous substances in soil, groundwater, surface water runoff, uptake in plants and animals, air emissions, marine environments and species, and air borne particulate matter. The Contaminants of Concern (COC) that should be investigated include, but are not limited to: -Munitions and explosives of concern (MEC); -Metals, including lead from small arms munitions, mercury, beryllium, cadmium, arsenic, copper, aluminum, -Depleted uranium (DU), strontium 90, and other radioactive contaminants, -PCBs,dioxins and furans, -Energetics and explosive constituents and their byproducts, -Per-and polyfluoroalkyl substances (PFAS) which is commonly found in fire-fighting foam,	The Draft EIS includes a discussion on the use of best management practices (BMPs) in place to prevent unintentional release of fuels in Sections 2.5 (Best Management Practices) and Section 3.12 (Hazardous Materials and Waste) in the Draft EIS. Section 3.12 includes a discussion of potential effects to hazardous materials and waste from the Proposed Action. Of the listed Contaminants of Concern (COC), the COCs found within the Project Area include munitions; lead batteries; Per- and polyfluoroalkyl substances (PFAS); launch propellants; petroleum, oil, and lubricants (POLs); potential asbestos-containing material; pesticides; and "cabinet scale" aerosols (cleaning agents, solvents, lubricants, adhesives). A discussion of the Best Management Practices (BMPs) used in the management of these materials can	Hazardous Materials and Waste, Air Quality and Greenhouse Gases

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				-Percholorate, a common chemical in rocket fuels, -Petroleum, oil, and lubricants (POLs), -Volatile organic compounds (VOCs), including solvents, pesticides, and herbicides, -Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and Polycyclic Aromatic Hydrocarbons (PAHs), -Asbestos, -Various kinds of air pollution emissions.	be found in Section 3.12. Air pollution, and the associated BMPs, is discussed in Section 3.10 (Air Quality and Greenhouse Gases).	
55	Kyle Kajihiro	Ethnic Studies, University of Hawai'i at Mānoa	29	Cumulative Impacts The EIS must incorporate data and analysis of the environmental effects of all past military activities at PMRF and KPGO, including: -A comprehensive list of all military activities ever conducted at PMRF and KPGO, including any nuclear, biological, and chemical weapons tests and military activities by other service branches and foreign militaries. -A comprehensive study of toxic and hazardous substances and their effects on the human and natural environment. -A description of all munitions used, the quantities used, the explosive yields, contaminants associated with these munitions, the extent of unexploded ordnance contamination, and the results of any removal actions. -A comprehensive report on wildfires, their causes, responses, and environmental consequences. The EIS must also take into account the	Chapter 4 of the EIS includes analysis of the cumulative effects of the Proposed Action in combination with past, present, and reasonably foreseeable future actions. Section 4.1 of the Draft EIS describes the timeframe for the analysis in this EIS. As stated in Section 4.1.2, "For purposes of this analysis, past and reasonably foreseeable projects are those within 5 years of the preparation of this EIS (i.e., 2019 through 2029)." A relevant list and explanation of activities within the cumulative effects study areas are included in Chapter 4, and a description of current activities is included in Chapter 3 of the Draft EIS. It is out of the scope of this EIS to include a comprehensive list of all military activities, a comprehensive study of toxic and hazardous substances, descriptions of	Cumulative Effects

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				combined environmental and cultural impacts of all past, present, and reasonably foreseeable future projects at or near the project area. Provide a list of all of the public and private users of the facilities at PMRF and KPGO, including the defense aerospace contractors, U.S. and foreign entities, and University of Hawaiʻi programs such as the Applied Research Laboratory. Thank you for your attention to these comments.	munitions used and any removal, or list of all wildfires at PMRF. A list of the hazardous materials used or stored in the region of influence (ROI) are listed above (in response to comment #28). As discussed in Section 3.9 (Public Health and Safety) and 3.12 (Hazardous Materials and Waste), the Draft EIS includes a comprehensive list of the Standard Operating Procedures (SOPs) and Instructions that are utilized in the management of hazardous materials and waste at KPGO and PMRF. The PMRF-EIS website (mentioned below) contains a document which outlines procedures to be followed in the event of a spill (provided in flow chart form), and is available on the PMRF KPGO EIS website, http://www.pmrf-kpgo-eis.com. A consolidated list of hazardous substances, along with links to the chemical details and regulations for use and storage, can be found at the following website: . The PMRF Oil and Hazardous Substance Spill Contingency Plan, which contains all safety data sheets (SDS) for any hazardous material within the ROI, contains a section which outlines firefighting measures for each chemical stored in the ROI. PMRF Crash/Fire provides	

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					firefighting services to PMRF and, under a Memorandum of Understanding with the County of Kaua'i, Crash/Fire provides firefighting services to the County on non-Department of Defense (DoD) lands. The PMRF Brush and Wildland Firefighting internal procedure, which outlines the procedures for department members while operating and fighting brush and wildland emergencies, can be found on the EIS website. Additionally, the Fire Information for Resource Management System website located at https://www.earthdata.nasa.gov/data/tools/firms provides historic and current wildfire data throughout the United States (U.S.) including Hawai'i. The Hawaii-Southern California Training and Testing (HSTT) EIS has evaluated the number, location, and types of munitions used in Hawaii for Navy activities. The tables, and their respective information, are summarized below. This information can be found in the following tables of the HSST EIS: • Table 3.2-12: Constituents found in munitions (other than explosives) • Table 3.0-12: Typical air explosive munitions used during Navy activities	

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					• Table 3.0-19: Number and Location of Non-Explosive Practice Munitions Expended During Training Activities • Table 3.0-20: Number and Location of Non-Explosive Practice Munitions Expended During Testing Activities • Table 3.0-21: Number and Location of Explosives that May Result in Fragments Used During Training Activities • Table 3.0-22: Number and Location of Explosives that May Result in Fragments Used During Testing Activities • Table 3.0-23: Number and Location of Targets Expended During Training Activities • Table 3.0-24: Number and Location of Targets Expended During Testing Activities • Table 3.0-25: Number and Location of Other Military Materials Expended During Training Activities • Table 3.0-26: Number and Location of Other Military Materials Expended During Testing Activities The 2018 HSST EIS can be found on the PMRF-KPGO Draft EIS website at www.PMRF-KPGO-EIS.com.	
56	Anonymous	n/a	1	No consent. No continued military presence at PMRF. Please restore the land the military occupies to its natural state,	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your	General Opposition to Navy

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				return the lands to the native Hawaiian people, and leave.	participation. Your opposition to the military presence at PMRF is noted. The EIS has been prepared consistent with the United States (U.S.) and State of Hawaiʻi's environmental regulatory framework. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the State. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
57	Sommer Kauakahi	n/a	1	I support alternative 3: no action alternative. Come spring of 2025, there also needs to be much more advertising/public service announcements made to the public. Banners, radio announcements, newspapers, and social media, so the larger community can also know and be aware. One of my reasons for support in alternative 3, may fall under environmental justice. I am acutely aware of the mental stress & anxiety it gives many Kanaka Maoli, myself included, to see the illegally occupying powers that have no Treaty of Annexation illegally occupying the ceded lands of the lawful	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple	EIS Process, Cultural Practices, Biological Resources, Land Use, Water Resources

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				Hawaiian Nation. Not only should birds & plants be included in the EIS, but also the reef, the limu, the coral, the opihi limpets etc which are all important natural & cultural resources.	consecutive newspaper and social media advertisements (also see Appendices G and I in the Draft EIS). Public outreach for the Draft EIS public review period will include banners, radio announcements, newspapers, letters, and social media announcements. The Draft EIS public scoping meetings will also be live- streamed and will include an opportunity for public comment. Please refer to Section 3.4 (Biological Resources) for potential effects to wildlife from the Proposed Action. Potential effects to access and to Native Hawaiian practices from the Proposed Action are discussed in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS. Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all	

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					infrastructure from the leaseholds and easement lands. As described in Chapters 1 and 2 of the Draft EIS, the scope of the EIS includes land-based leaseholds and easement lands; therefore, marine resources, such as endangered monk seal and sea turtle, are not covered in the scope of this EIS.	
58	Ron Ikeda	Department of Education	1	Dear Ms. Wells: Thank you for your letter dated April 30, 2024. Based on the information provided, the proposed project will not impact the Hawaii State Department of Education facilities. Should you have any questions, please contact Cori China of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us. We appreciate the opportunity to comment. Sincerely, Roy Ikeda, Interim Public Works Manager, Planning Section	On behalf of the Navy and NASA, the EIS team thanks the Department of Education for their participation.	Proposed Action
59	S. Strom		1	Aloha, my 'ohana and I attended one of your meetings recently, and after careful rview of your shared info, I would like to add some comments. I would offer that the Navy has met with the local community in past years over RIMPAC and SONAR concerns, listened to passionate testimony from the people, but to little or no avail. The recent debacle of Red Hill has done little effect on boosting the people's confidence of the Navy's good intentions toward fostering a benevolent relationship with the community of	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. The EIS has been prepared consistent with the United States (U.S.) and State of Hawaiʻi's environmental regulatory framework. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and	Existing Operations

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				Hawaii, although we are addressing specifically Kauai's at the moment. I have tremendous respect for our military outside of the operations of the military industrial complex, which we all hope is not operating in continuity, but rather an honest, transparent military which serves and protects its citizens and environment first and foremost, instead of 'forever wars' and invasions.	Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Although impacts at Red Hill are outside the scope of this EIS, the Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). PMRF will continue to engage with the community through partnerships among the military services, private conservation groups, and state and local governments as described in Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS. Chapter 5 (Mitigation and Enhanced Management Measures) describes actions the Navy and NASA is currently taking to avoid and minimize impacts from the Proposed Action and would continue to implement under the action alternatives. Additionally, the Navy and NASA have identified enhanced management measures (EMMs) that aim to promote additional property management protections for the ʻāina.	

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59	S. Strom		2	NASA has tainted itself with deception, and has become an endless vacuum of our tax dollars, with little to show for its gargantuan costs, and zero contribution toward the betterment of humanity. What NASA does not, Space Force and Starlink can do better.	Your opposition to NASA and their activities has been noted.	General Opposition to NASA
59	S. Strom		3	Therefore, I am making the following recommendations: (1) The possible renewal of Navy lease lands reduced to the 410 acres in actual use only, and with stipulations that require the Navy to expand their role and duties to: (A) Utilize an alotted time schedule to provide for humanitarian services to the public, such as: infrastructure assistance, re-generation assistance with lands and expansion of permanent housing facilities, agriculture, and garden communities to those in dire need of generational homes, clean water, energy installation, and other purposes which lend strength, overally health, and continuity of the local communities, among other seafaring, protective duties including (B) assisting with organic regeneration activities of our ocean, waters, marine life, beaches, etc.	The Draft EIS includes a description of purpose and need for the Proposed Action (Section 1.4) as well as the alternative screening process (Section 2.2). According to these criteria, Sections 2.3 (Alternatives Carried Forward for Detailed Analysis) and 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS identify alternatives. As described in Section 2.4 of the Draft EIS, a smaller footprint was considered, but it does not meet the screening factors described in Section 2.2. Chapter 3 of the Draft EIS analyzes the potential effects for these alternatives carried forward for detailed analysis. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discussed the development and continuation of the One Kaua‘i Hui	Alternatives, Purpose and Need for the Proposed Action

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					(Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders. Finally, EMM-3 outlines the Navy's commitment to provide the public with annual wildlife summaries, including status updates and data reports and research studies.	
59	S. Strom		4	(2) NASA transfer its technologic infrastructure over to the oversight of Space Force, and phase out NASA's presence here on Kauai completely. It is my recommendation that NASA's lease be NOT renewed, and Alternative 3: No Action Alternative be administered.	Comment noted. See response to comment #3 regarding the development of alternatives analyzed in the Draft EIS. Analysis of potential impacts from the No Action Alternative is included in the Draft EIS consistent with legal and regulatory requirements.	Alternatives, Purpose and Need for the Proposed Action
59	S. Strom		5	Mahalo for your outreach, and enabling us t respond to your projections. Respectfully, S. Strom and 'ohana, Kaua'i, HI 96766	Thank you for your participation, on behalf of the Navy and NASA, the EIS team appreciates your recommendations.	EIS Process
60	Susan Strom		1	This is Susan Strom. I live on the island of Kaua'i, and I just wish to share my concerns about the renewal of a lease for NASA, in particular, and this being that NASA has a sordid history of Nazi infiltration in its genesis. And there has been very little that has been done over these many years since NASA's beginning -- NASA's beginning that benefits humanity in any way. We have been, as citizens, funding this organization for many, many years. And the money seems to appear to	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds	General Opposition to NASA

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				just disappear down a black hole. I have not seen with NASA's existence here in Kaua'i any real benefit to help uplift humanity and help humanity here, but we've all been funding it without our own consent. So I don't feel that its lease is something that should be considered for renewal at this time. Thank you.	(Section 2.3.2). Neither action alternative includes additional development. PMRF will continue to engage with the community through partnerships among the military services, private conservation groups, and state and local governments as described in Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS. NASA services, such as geospatial and navigation systems, are discussed in Section 1.3.4 (NASA KPGO Space Geodesy Mission). Analysis of the effectiveness and usage of funding for NASA activities and missions is not within the scope of this EIS.	
61	Alice Parker		1	Okay. Alice Parker, Lihue. Okay. Ready? I'm concerned about the education of the staff's children. The schools here are not very good, I feel. So how are they going to augment the inadequacies of our local schools? Okay. That's it. Thank you so much.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Ongoing community outreach is discussed in Section 1.7.5 of the Draft EIS and includes PMRF's outreach activities to the local Kaua‘i schools. Schools and youth programs that collaborate with the Navy and/or NASA include: Kamehameha Schools, Waimea High School, Kaua‘i Community College, Girl Scouts of American, Boy Scouts of America, and Līhu‘e Middle School. The Navy and NASA are presenting enhanced management measures (EMMs) under the action	Socioeconomics

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					alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders.	
62	Lana Bilbo		1	I'm Lana Bilbo. And then just go? Okay. So I support the no-action alternative. The concerns that I have include the fact that this EIS is not going to take into consideration the environmental impacts in the ocean, which seems really crucial. I know that you guys have a separate EIS for that. But kind of artificially breaking these, like this lease is to support the base, which is doing those things. And it seems like a really artificial way of breaking them up so that you don't have to consider it for this part of the process, which I don't think is right. I think that the lease should very much be available to the public to review. I noticed that you guys only said the words fair market value one time in this entire thing, and it's not written on any of the boards. It kind of seems like you're trying to hide the fact that the previous lease was only for a dollar. Doesn't seem cool. I noticed that	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. We value your concerns. Detailed discussions of alternatives carried forward and alternatives not carried forward can be found in Section 2.3 (Alternatives Carried Forward for Detailed Analysis) and Section 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis). The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action	General Opposition, Proposed Action, EIS Process, Socioeconomics

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				the way that we're able to provide testimony for this is that we have, like, a room in the corner, and we're being recorded and that we don't have an opportunity to engage as the public with each other, as well as with this process. And I think that that is a very obvious strategic ploy that is also used by developers in this county to sort of minimize and isolate the pushback on projects, and it's pretty obvious.	alternative includes additional development. The area of analysis is limited to the leaseholds and easement lands as described in Chapters 1, 2, and 3 in the Draft EIS, and environmental effects from activities conducted on fee simple lands are not within the scope of this EIS. Additional information regarding the history of leases and easements can be found in Section 3.5 (Land Use and Access) of the Draft EIS. As described in Section 3.6 (Socioeconomics) of the Draft EIS, the fair market value will be determined in collaboration with relevant parties and shareholders when a final action is carried forward. Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and H in the Draft EIS). Outreach for the Draft EIS	

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					public review period will include banners, radio announcements, newspapers, and social media announcements. The format of the public scoping meetings was consistent with Hawaiʻi Administrative Rules (HAR) Section 200.1-23(d) which requires a separate portion reserved for oral public comments. The Draft EIS public meetings will be live streamed and include a public hearing format. The Hawaii-Southern California Training and Testing (HSTT) EIS and Land-Based Training (LBT) Environmental Assessment (EA) are incorporated by reference and available on the PMRF KPGO EIS website (www.pmrf-kpgo-eis.com). The HSTT EIS examines the in-water impacts to water resources. Appendix C of the Draft EIS includes the current real estate agreements for public review. Details of the original lease amount, as well as amendments, can be found in Section 1.3 (Background). The new real estate agreements, under Alternative 1 and 2, will be negotiated with the Board of Land and Natural Resources (BLNR) for fair market value of the land. ***Note to Reviewers: Based on 12/30/2024 email from J. Chen, waiting for guidance from Navy***	

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					legal on how to respond to K. Ling's request to include the dollar amount in the response.	
62	Lana Bilbo		2	And I'm kind of confused how the cultural impact assessment was initiated in November, but isn't really -- I'm confused how those two things are tied together and especially how no one that I know in the Hawaiian community knows about that or has been consulted. Like, they just found out about this EIS through, honestly, me texting them about it. And so if that process started in November, I'm really confused as to why none of the cultural groups that I work with are aware of that process. And I would say that for now, that's most of my comments. Oh. And I hope that these comments will be made available to the public for review so that we can see what each other are saying, since you've set up this process so that we can't talk to each other. So I hope that the comments will be made available to everybody to look at during this process so that we're not intentionally siloed. Thank you so much.	As described in Section 3.3 (Cultural Practices) of the Draft EIS, Hawai'i Revised Statutes (HRS) Chapter 343 (as amended by Act 50 in 2000) and Hawai'i Administrative Rules (HAR) 11-200.1 requires the disclosure of the Proposed Action on the cultural practices of the community and state, and the 1997 Environmental Review Program (ERP) (Office of Environmental Quality Control) Cultural Impact Assessment (CIA) Guidelines provides methodology and content protocol for the CIA that inform the EIS process. Details about cultural practices and surveying can be found in Section 3.3 (Cultural Practices) of the Draft EIS. All public comments received during the scoping period are included in Appendix I of the Draft EIS. The EIS team looks forward to engaging with you and the members of the public during the Draft EIS public meetings.	Cultural Practices, Consultation
63	Wesley Yadao		1	Okay. My name is Wesley Yadao. I just want PMRF to open more fishing areas to the public, so that it's all about cultural practices that we need. That's about it. That's about it, just opening more fishing	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale,	Land Use and Access, Cultural Practices

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				areas to the public. That's all I have for now.	Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted travel and access to Majors Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the 'āina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-2 discusses continued access for subsistence, habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Access to the project area for cultural practices is also described in Section 3.3 of the Draft EIS. Please contact the PMRF Public Affairs Office for more information: (808)	

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					335-4740 or PMRFPublicAffairs@us.navy.mil.	
64	Punohu Kekauala III		1	My name is Punohu Kekaulua III, and then just go with my -- this is my comment or testimony. The state lands are crown lands belonging to the chiefs via Great Mahele, which were superior land titles, allodial, that belonged to our ancestors, giving Kanaka an undivided shared interest to the lands. In alternative one, they're asking to lease the lands, release them from the State of Hawaii or DLNR. But they have yet to prove these crown lands belong to them to be able to lease them out. Alternative two, where they're possibly thinking about purchasing the land, the Navy wants to purchase, this should be impossible for Navy to buy state or crown lands because the state can't sell something that does not belong to them. And alternative three, to avoid court cases or community uproar, the Navy should be asking descendants of Victoria Kamamalu, who has a title to the property, to lease it, if they want to do it legally from the true owners of the property. The treaty of annexation has yet to be presented as evidence to prove that Hawaii is the 50th state of America. Without it, the Country and Kingdom of Hawaii are still in existence.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The EIS has been prepared consistent with the U.S. and State of Hawai‘i's legal and regulatory framework. A history of land tenure and land use in the Project Area is described in Section 3.5 of the Draft EIS. The current real estate agreement is provided in Appendix C.	Land Use and Access, Socioeconomics, Cultural Practices
64	Punohu Kekauala III		2	Kanaka Maoli, or Hawaiian nationals, have a vested right to their country and its lands through -- through birth. With no treaty of annexation, why is the U.S. Navy	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing	General Opposition to Navy, Land Use and Access,

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				here? We are an occupation, so the Navy should change the state to a military government and help with the reconciliation process to give our Kanaka back their rights to self-determination and their private properties. Help hold the fake state and Ag Department accountable for poisoning our precious land and resources. We -- for us Hawaiian nationals, we understand that American citizenship is a voluntary right, not mandatory. So with that being said, administer the law of this land, the kingdom land -- or kingdom law, sorry.	new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. A history of land use is included in Sections 1.3 (Background), 3.2 (Archaeological and Architectural Resources), and 3.5 (Land Use and Access). Potential effects from the Proposed Action to biological resources and public health and safety are discussed in Sections 3.4 and 3.9, respectively, of the Draft EIS. Section 3.12 (Hazardous Materials and Waste) of the Draft EIS includes a discussion of the use of best management practices in place to prevent unintentional release of fuels and adherence to applicable state and federal regulations regarding the disposal of hazardous or toxic wastes.	Hazardous Materials and Waste, Socioeconomics, Relevant Laws and Regulations
65	Jose Felix-Keamoai		1	My name is Jose Felix-Keamoai. I'm a resident of Kekaha here on the Island of Kauai. I'm also an employee, one of the contractors, for PMRF. Contractor name is Koa Lani JV, LLC. We're also involved in the community of Kekaha in youth sports. Organization is Pop Warner Football and Cheer for Kekaha. Hearing the voice of some of family or friends in the	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using	Land Use and Access

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				community, knowing that I work at the base at PMRF, they always ask: How do you get access to -- to the beach, which would include fishing -- fishing size, fishing grounds? And I believe there's maybe two options that they have. So the question or request would be, what I'm hearing from the community is: Can they open more fishing access at PMRF? Through an MWR permit would be probably the only way that you can access it. Before 9/11, there was beach access all the way through from Kekaha Beach all the way through to Polihale. There was no barriers. People were allowed to fish, walk all the way through and camp, but now they're not -- but now they're not able to camp or fish. Again, only two options. So again, the question or suggestion is to open up more sites to allow non-PMRF workers to be able to have access to the beach, and of course, including water sports, surfing, and -- and scuba diving.	the main gate and affords unrestricted travel and access to Majors Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF for recreational purposes such as fishing and surfing. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. Camping is permitted on the shoreline on Ground Hazard Area (GHA) Easement 2 within Polihale State Park. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the 'āina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-2 discusses continued access for subsistence, habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. For more information, please contact the PMRF Public Affairs Office for more information: (808) 335-4740 or pmrfPublicAffairs@us.navy.mil.	
65	Jose Felix-Keamoai		2	Another concern or -- that I hear from the community is questioning if -- if we would	Thank you for your recognition of PMRF services provided to the	Proposed Action, Public Health

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				one day become a responsive base. And the only reason for that is once we become a responsive base, pretty much we would be considered a target. And the concern with the people is that we're going to get basically attacked on this side of the island. So is there any plans to not only make PMRF a testing facility, but a response active facility? And if it does become a -- a response facility, what contingencies -- plans are there to safeguard the community? I want to add and -- and actually just give testimony to in the past, personnel at the base have been very helpful when it comes to natural disasters by using or utilizing the -- the flight line and bringing in supplies. So another question would be: Will PMRF continue to allow to open the runway for national emergencies to bring in supplies, as needed?	community in times of need. The flight line will continue to be available for national emergencies if resources are available. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The scope of analysis for the Draft EIS is the Navy and NASA's use of state lands, and potential effects to public health and safety from the Proposed Action and No Action Alternative are described in Section 3.9 in the Draft EIS. If you need more information, please contact the PMRF Public Affairs Office.	and Safety, Cumulative Effects
65	Jose Felix-Keamoai		3	One more question. Knowing that capabilities or technology is advancing and new developments arise every day, what new developments are in the horizon to expand our -- our technological advancements or keep up with our technological advancements? Or any new radars or technology, when they do become available to this site, will there be the same communication to allow people to be acknowledged and have testimony	Development on the Project Area is not scheduled at this time and is not included in the scope of this EIS. As described in Section 2.3 (Alternatives Carried Forward for Detailed Analysis) of the Draft EIS, under Alternatives 1 and 2, the Navy and NASA propose to maintain the size of current real estate agreements and do not propose any new development or change of use. If	Proposed Action, Land Use and Access

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				to concerns or questions? And that's all my questions. Thank you very much.	and when future development or technologies are proposed at PMRF, the appropriate level of environmental review would be conducted with accompanying public notification.	
66	Nākaiʻelua Villatora		1	ʻO Nātaiʻelua Villatora koʻu inoa. No ka mokupuni o Kauaʻi, ahupuaʻa o Kalapaki, moku o Puna. Noho au ma ka ahupuaʻa o Pōkiʻikauna ma ka moku o Kona. Ke nīnau aku nei wau, pehea aku nei i kēia wahi aupuni o Hawaiʻi, e ai aku i ka hoʻohana ana i kēia mau ʻāina a me ke kumu waiwai ma Kauaʻi nei e pili ana ka military, ka Navy a me NASA. He noi e aʻe, e ano noi haʻahaʻa e hoʻokoaʻe ai a laila. Haʻawi aku ai i nā palapala, hōʻike aku ai i ka palapala i na hoʻoilina nō ka ano ai like ma waena o ka Navy a me NASA me ke aupuni o Hawaiʻi. E hoʻohānai a hoʻohōʻai i ko lākou hoʻohana ana i kā ʻāina. Mahalo nui, mahalo. Okay. So I'm going to switch over to English so you can type. My name is Nākai'elua Villatora, and I am from the island of Kauai from the Ahupua'a of Kalapaki and the Moku of Puna. But I currently reside at the Ahupua'a of Pōkiʻikauna in the Moku of Kona. My testimony would be asking about the original deeds and documents that the Navy and NASA has with the state, and is that provided for a public viewing? Also, would like to -- or would like -- would like to find the -- the documentation of the data of natural resources utilized by the	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Original real estate agreements are included in Appendix C of the EIS. As described in Section 3.4 (Biological Resources) in the Draft EIS, PMRF has an Integrated Natural Resources Management Plan (INRMP) that is updated regularly. The 2023 PMRF INRMP is the most recent version and can be found on the PMRF KPGO EIS website (ww.pmrf-kpgo-eis.com). Natural resource data is collected by PMRF natural resource staff as well as contractors and partnering agencies. Natural resources located in the Project Area and potential effects from the Proposed Action to these resources are described in Section 3.4 of the Draft EIS.	Proposed Action, Biological Resources, Cultural Practices, Land Use and Access, Water Resources

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				Navy, military, and NASA, for instance, like the punawai spring water resources, any other natural resources, like pertaining to rock formation or any boulders, and then also, like, more in-depth details of what they utilize in the said property.		
66	Nākaiʻelua Villatora		2	Another thing that I would like to able to express is how much of the -- I -- I understand, like, they are promoting readiness for the military. And what is that readiness? What details is that readiness about? Like, I want to be able to know, like, what type of -- may be -- how I was, like --I'm, like spacing out on what I was going to say? Kalamai. What are -- what are you trying to be ready for, you know, the type of war, etc.? And then. also, what are the benefits of the kaiaulu, or community, here on Kauai? What are the benefits for us, besides this whole protection of ourselves, you know, from -- from unseen forces? And then also -- I was, like, shoot. Where's my paper. Another thing, I just would like to be able to see more -- more information data on paper, where -- for people to provide. Mahalo.	As described in Section 2.3 (Alternatives Carried Forward for Detailed Analysis) of the Draft EIS, under Alternatives 1 and 2, the Navy and NASA propose to maintain the size of current real estate agreements and do not propose any new development or change of use. Ongoing Department of Defense (DoD) activities on the larger PMRF installation on fee simple land are outside the scope of this EIS, but are publicly available in previous environmental analysis documents (listed in Appendix K of the Draft EIS). Potential socioeconomic effects from the Proposed Action are discussed in Section 3.6 (Socioeconomics) of the Draft EIS. Military readiness activities are actions needed to address challenges across the air, sea, ground, and space domains. Such activities include training and research, development, test, and evaluation activities. Military readiness is further discussed in Section1.3 (Background) of the Draft EIS.	Purpose and Need for Proposed Action, Land Use and Access

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67	Roslyn Cummings		1	Aloha nō, koʻu inoa Roslyn Cummings Manawaiakea, noho au Kalaheo ahupuaʻa, Kona moku, Kauaʻi mokupuni. So I reside in the Kona moku (district), in the Kalaheo Ahupua'a of the Kauai Island in Hawaii. So this is my oral testimony in regards to the Navy and NASA's proposal today. What is the date? May 5th of 2024 oh. Why did I say May? Okay. June 25th (sic) of 2024. Okay. So here's my ʻike ʻoiaʻiʻ, my truth, my knowledge of truth. When water traverses from mauka in our in our forests, and it traverses -- whether underground or above ground, it picks up the nutrients that is needed by everything that surrounds it in its the environment, whether it's the Maoli manu, which is the native birds, or the (indiscernible), the native plants. So when water gets diverted, whether it's mauka or makai, on the shorelines, it affects that Kauai cycle.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Section 3.7 (Water Resources) of the Draft EIS includes a description of natural and manmade water features in the project area. Section 3.3 (Cultural Practices) of the Draft EIS describes culturally important water features in the region of influence, and Section 3.4 (Biological Resources) of the Draft EIS describes the Hawaiian waterbirds and other avian wildlife that utilize freshwater bodies located in Mānā Plain.	Biological Resources, Water Resources, Cultural Practices
67	Roslyn Cummings		2	So one of my greatest concerns with any type of project is to know what the water qualities are, what the water usage is, contaminations. And knowing that the Navy has a history with not good practices here in Hawaii, Kaho'olawe, for instance, Niihau, depletion of water tables. I grew up here on Kauai. My family's actually from here. We were the last family to live in Nu'alolo in Napali. We grew up in Polihale. During the summers, we'd sit -- we'd spend months in the summers there. And so back -- I was born in the '80s. So back in the day, up until the '90s and the early 2000s, we were able to gather	Section 3.7 (Water Resources) of the Draft EIS includes a description of water resources (including water quality monitoring results) in the Project Area as well as potential effects to water resources from the Proposed Action. Additional information on the maintenance of the Mānā Water Well is included in Section 3.8 (Utilities) of the Draft EIS. The 2024 Mānā Water Well System Water Quality Report is available on the PMRF-KPGO EIS website, www.pmrf-kpgo-eis.com. Additionally, a copy of the PMRF	Water Resources, Land Use and Access, Cultural Practices

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				punawai, which is spring water. We would drink spring water, which is no longer accessible. So we don't know exactly what's happening with the water. And these are all within that Navy zone -- what -- what is it called? Easement. Within the navy's easement zone.	Potable Water Sampling Operation and Maintenance Procedure can be found on the website.	
67	Roslyn Cummings		3	As far as NASA, though, my concerns for NASA is there was a point in time where there was a water quality testing that happened in Miloliʻi, M-I-L-O-L-I-I, Miloliʻi. This is a secluded area on the Napali coast. That testing got to UH, but it never became public. And within that testing, there was a high levels of contaminant. The component was iron, and it wasn't a natural iron. So my question is: Is there something that's happening up in that area in NASA and the Navy that they're – they're leasing those lands from the state, is it affecting something below? Is there some kind of natural waterway, there's something seeping from their -- their building? From whatever they're doing up there, is it seeping down into the ground and coming out into that particular area in the reef area that's causing the contaminant to cause a flesh-eating bacteria?	As described in Section 1.3.5 (Navy and NASA Use of State Lands) of the Draft EIS, the Navy's activities at Miloliʻi is limited to the use of passive use reflectors. Section 3.12 (Hazardous Materials and Waste) of the Draft EIS explains that the only hazardous materials that are stored at this site are lead acid batteries which are used to power the solar panels at the site. The batteries are replaced approximately every 5 years and recycled at a local retailer. Section 3.7 (Water Resources) of the Draft EIS describes conditions at this site; there is no Navy use of surface water or groundwater.	Water Resources, Hazardous Materials and Waste
67	Roslyn Cummings		4	Another thing is ancestral burials, iwi kupuna. There's a law -- it's a kingdom law, actually, it's an older law -- and it talks about the law of the sepulcher. And sepulcher, in English terms, is basically graves or burials. And so with this law, it	As described in Section 3.2 (Archaeological and Architectural Resources) in the Draft EIS, PMRF complies with the National Historic Preservation Act through the 2012 Programmatic Agreement, PMRF	Cultural Practices, Archaeological and Architectural Resources,

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				basically protects burials. So whenever we have any kind of disturbances, we have an issue here in Hawaii, where archaeologists come out and have a tendency to remove burials. That's technically desecration in our culture. And regardless of the proper protocols, we need to realize that there's something in our culture called wai wai. Wai wai is a word that you can use for natural resources. Wai wai is a word that you can use for wealth. Wai wai is a word that you can use for imprint. Wai wai is pretty much what bases our sustenance. It's what Kanaka Maoli nā kanaka rely on. And 'aina is everything that we consume. It's part of what we consume. That's 'aina. It doesn't limit to wai or kai. 'Aina is everything that we can consume. So we really need to take into consideration that these practices that we're accustomed to might be more of a haole, foreign, concept versus a Maoli, a native concept, and start to respect these boundaries that our ancestors -- there's this huge gap between what we know now and what our ancestors knew then, and we need to take into that policy and that reverence and respect of what is naturally there.	follows established Native American Graves Protection and Repatriation Act procedures as agreed to in the Comprehensive Agreement Between United States (U.S.) Department of the Navy at Pacific Missile Range Facility, Kaua‘i, Hawai‘i, and Na ‘Ohana Papa o Mana, as well as Standard Operating Procedures (SOPs) in the Integrated Natural Resources Management Plan (INRMP). The Draft EIS describes in Section 3.3 (Cultural Practices) that iwi kūpuna (human skeletal remains) are likely to be found through the sand dunes in the region of influence (ROI). The Navy and NASA recognize the burial grounds in the ROI and regularly coordinate with the Hawaiian community as described in Section 3.3 and Section 1.7.5 (Ongoing Community Coordination) to construct Lua Kupapa‘u O Nohili (Nohili Burial Crypt) and on repatriation. Burials at PMRF are not moved without prior consultation with the Native Hawaiian community.	Biological Resources, Water Resources
67	Roslyn Cummings		5	So if our kupuna -- for instance, the history that I know of where the military base is, so there's an area called Nohili. From what my ancestors taught me is that area is one of the oldest settlements of a Tahitian village, which means that there are Tahitian navigators that navigated to	Thank you for sharing historical context from your ancestors. Water resources, including water quality monitoring results, are discussed in Section 3.7 (Water Resources) and 3.8 (Utilities) in the Draft EIS.	Water Resources, Cultural Practices, Public Health and Safety

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				Kauai and settled in that area. So with respect to the cultural practices of our ancestors that arrived from Tahiti, it makes me very concerned about how many of them are disturbed. So for someone who has a gift of kahea and the gift of being able to create kūleana nā iwi kūpuna, I think about that wai wai, that imprint that our ancestors leave behind, and future generations that are meant to receive that imprint, and that is what is pretty much invaluable. It's --it's a value that has no money mark on it. So I need you guys to understand that water, especially spring, has the necessary nutrients that our body requires, especially for women, because that's part of what our reproductive organs rely on. And that's the type of studies that I think needs to be made in respect to what is natural for us and our environment. So I want that to be stated on record, that I want the protection of our wai, of our punawai, of our waterways, because it doesn't only affect women and -- and our natural ability to reproduce. And the thing is, reproduction in our culture is not limited to making babies. It's also part of our creativity. So when our body has a natural flow, we're naturally creative. And when a -- when we have a male in our lives, like a -- what we call kane, we're able to carry that creativity into their aspect of providing, and then there's a balance between kane and wahine,	Culturally important water features are described in Section 3.3 (Cultural Practices). A history of land use is included in Sections 1.3 (Background), 3.3, and 3.5 (Land Use and Access) in the Draft EIS. As described in Appendix E of the Draft EIS, regulations protecting water resources include the Clean Water Act, the Safe Drinking Water Act, and the State Water Code. For further regulations and laws related to water, please refer to Appendix E. Potential effects to water resources from the Proposed Action are described in Section 3.7. Additionally, a copy of the PMRF Potable Water Sampling Operation and Maintenance Procedure and the 2024 Mānā Water Well System Water Quality Report is available on the PMRF-KPGO EIS website, www.pmrf-kpgo-eis.com.	

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				between male and female. So that's -- it's the bigger scope of things.		
67	Roslyn Cummings		6	Another thing is that we have to think about the mo'omeheu, which is cultural practices. Mo'omeheu is a cultural practice that we carry from mauka to makai, so you're talking about mea ho'olako, which are providers. We also have hahai holoholona which are hunters. And the reason why we stay away from the English terminology is because they're all coded in commerce laws, so we utilize our language, by law, it's our right to utilize. And going back to natural, basic human rights, which is written in the Constitution, which the Navy has to abide by any treaties that are being made in any nation -- right -- nation-to-nation tradition treaties within the state, which is where we're in, we're within Hawaii. So going back to these practices, you have the fishermen, you have the lo'i. These are basically what they consider wetlands. There's all these practices within this ecosystem that we call 'aina, and we call it kuleana. And kuleana is respect and responsibility. So we need to take into that acknowledgement that if we had 100 people in one room, each and every one of us would have a kuleana, and they're all going to be different. And we have to come to that concept that we're all equally doing our kuleana. So I want to, you know, acknowledge that. So mahalo for your time, and I hope this helps.	Cultural practices and resources are discussed in Section 3.3 (Cultural Practices) of the Draft EIS. Appendix F of the Draft EIS includes the Cultural Impact Assessment (CIA). The CIA includes interviews with Native Hawaiian cultural practitioners to identify potential impacts from the Proposed Action on cultural practices. Again, mahalo for providing cultural practices from your ancestors.	Cultural Practices, Land Use and Access, Water Resources

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68	Christopher Ka'iakapu		1	My name is Christopher Lono Ka'iakapu of West Kauai, a generational descendant of West Kauai, a Native Hawaiian. And I would like to testify in support of alternative number three, the no-action alternative. And this is because I believe that the U.S. military presence at PMRF, no matter how much the studies try to do, mitigation measures they try to take, they will only continue to cause destruction of the environment or natural resources in our community. The entire nearby PMRF operation only exists because they create an artificial environment by the destruction of the Mana Plains wetlands in Hawaii's -- what was once Hawaii's largest ephemeral wetlands. And so they -- they create this artificial environment for the operation to exist, thereby creating critically endangered species. These wetland birds and these other great endangered species in the Mana Plains ecosystem would not be critically endangered if it were not for the habitat destruction caused by PMRF operations and the sugar cane industry. They maintain a pump system to pump down the water table and divert natural flood plains so that their --their operation can exist. So I find it very ironic that they're claiming to want to protect critically endangered species when their whole operation is the only reason that these species are -- their whole operation is the only reason that these species are critically engaged in the first place. They	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Your opposition to military presence is noted. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. As described in Section 3.3 (Cultural Practices) of the Draft EIS, wetlands on the Mānā Plain were filled or drained for sugarcane cultivation in the 1850s. The United States (U.S.) military did not begin development in the Project Area until 1940. Section 3.4 (Biological Resources) of the Draft EIS includes a discussion of potential effects from the Proposed Action to endangered waterbird species. The scope of this EIS encompasses land-based leaseholds and easement lands; therefore, marine resources are not covered in the scope of this EIS. Potential effects from the Proposed Action to marine resources, including the endangered monk seal and sea turtle that utilize	General Opposition to Navy, Biological Resources, Water Resources

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				also make no mention of studying or examining near-shore marine species, such as opihi and limu, which are bottom of the food chain. All the microorganisms are bottom of the food chain resources for our greater fishery. And because the operation is right on the shore, I believe that they should be doing that sort of study.	the terrestrial region of influence (ROI), are described in Section 3.4 of the Draft EIS. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leaseholds and easement lands are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	
68	Christopher Ka'iakapu		2	And I -- I don't believe that the Navy will be good stewards. I don't think they have a track record in Hawaii. The entire U.S. military has been a part of the insurrection and overthrow since 1893. And they have bombed Kaho'olawe. They have destroyed Pohakuloa. They have destroyed Makua Valley on Oahu. They have poisoned Red Hill on Oahu. They have destroyed Hawaii's largest, potentially the world's largest, fish pond system of Honolulu to create Pearl Harbor. They have instigated and drawn the Japanese bombing of Pearl Harbor. And they've destroyed the --- the wetlands of Mana. And now they are restricting access not for only Native Hawaiians but all residents on Kauai to what -- what once was some of the most	Comment noted. The Navy's environmental management programs at PMRF are described in Section 1.3.6 (Environmental Management and Stewardship) of the Draft EIS, as well as in Sections 3.2 (Archaeological and Architectural Resources) and 3.4 (Biological Resources). A history of land use in the project area including the Mānā Plain is included in Sections 1.3.1 (Historic Land Use at PMRF) and 3.2 (Archaeological and Architectural Resources). We value your concerns related to other military installations; however, impacts at Red Hill, Pōhakuloa Training Area, and other locations are outside the jurisdiction and	General Opposition to Navy, Land Use and Access, Water Resources, Biological Resources, Cultural Practices

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				productive fishery on the west side of Kauai.	scope of this EIS. The PMRF EIS team suggests contacting government officials to voice concerns regarding other military real estate agreements/operations. Potential effects to access from the Proposed Action are described in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access).	
68	Christopher Ka'iakapu		3	I don't believe that the State of Hawaii has the legal right to even be leasing these lands. The State of Hawaii is a fraudulent organization that is upheld by the U.S., the United States. And rightfully, these -- the lands that are proposed to be leased to the United States Military and Navy is -- is actually Hawaiian Kingdom ceded lands, crown lands, that is rightfully a part of the Hawaiian Nation. And so for the State of Hawaii to claim authority to lease out these lands is illegitimate and illegal according to international law. Yeah, I -- I oppose -- I oppose them renewing its lease. I -- I oppose the U.S. Military being in Hawaii. If they cared about our environmental and -- and cultural resources, then they would -- they would leave. They would go back home and leave us in peace, a peaceful Hawaiian nation, like we're -- we ought to be. I find it very -- I don't know -- telling and insulting that just about of the representatives here, there's probably as much PMRF staff here as there is	Comment noted. The EIS has been prepared consistent with the United States (U.S.) and State of Hawaiʻi's environmental regulatory framework. Appendix F contains cultural resource investigations such as archeological surveys at PMRF and KPGO and the Cultural Impact Assessment (CIA), conducted in support of this Draft EIS. Appendix M contains natural resource surveys at PMRF and KPGO conducted in support of this Draft EIS. A wetland delineation was conducted in support of this Draft EIS and can be found in Appendix N.	General Opposition, Biological Resources, Cultural Practices, Archaeological and Architectural Resources

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				community, and they are all not of Hawaii. They're all foreigners. So obviously, their interest is not in the best interests of our 'aina and our people. To me, it's just a symbol of continued colonization, and this is not what I want to support in my community. It's not what I think we should be supporting on a global scale. And this is -- this is just upholding the genocidal war machine of the U.S. Military industrial complex. Yeah. They should not renew the lease, and they should leave Hawaii in peace and stop pretending like they -- they are really going to study and care about our -- our environment and our biological and cultural resources. Thank you.		
69	Gordon Willson-Naranjo		1	My name is Gordon Willson-Naranjo. I am in support of the Navy lease because I recognize the importance of defense. And I understand that the impacts, while unfortunate, are a necessary evil. I appreciate the stewardship that the Navy has done on Kauai specifically. I believe the REPI Program is an exceptional means of providing DOD money for conservation and partnership. And I think that if the Navy were to leave Kauai, there would be an impact to the economics, as many folks on the west side specifically rely on the base for their income. That's it.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Ongoing community outreach is discussed in Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS. The potential effects from all alternatives are analyzed and compared in Chapter 3 of the Draft EIS. Also, a comparison of alternatives is included in Section 3.14 (Summary of Potential Environmental Impacts and Mitigation Measures) of the Draft EIS.	General Support for Navy, Biological Resources, Socioeconomics
70	Peleke Flores		1	Aloha. My name is Peleke Flores from Waimea. Yeah. Just give you mytestimony or comments for this meeting. Guess my	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your	EIS Process, Consultation, Archaeological

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				first comment for the meeting is I believe the meeting should be advertised better, like the front page of our local newspaper, versus a little slot in the back. Our local news, social media, state and county websites in the front page, and all our Kauai known -- Kauai-based known NHOs, or Native Hawaiian organizations. I know there's a list out there, but to be able to email everybody about this meeting would help have better due diligence, I guess. There are more -- it seems to me there are more staff members here and partners than community members. And then -- yeah. Doing more better historical research of Mana, Mana's aquaculture would be good, beyond the plantation period and looking at Hawaiian literature that talks about the space and transcribing it. Also, within this process, if we were to go through -- or if the lease is expanded, the -- the area, the agriculture area, should be designated for community use, not big corporations, seed companies, or GMO companies, stuff like -- they should work with NHOs or 'aina-based organizations to restore the place to a semi-functional fish pond, as it once was, and bring back the floating lo'is of Mana. And also, would like to a map or stats data looking at our service, the U.S. service members, how much lives on the base and how much rents outside of the base and how that affects or displaces our local community with higher rent and/or just	participation. We value your concerns. Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and H in the Draft EIS). Additional details regarding resources analyzed can be found in Chapter 3. Sections 1.3 (Background), Cultural Practices (Section 3.3), and Land Use and Access (Section 3.5) of the Draft EIS include a description of the history of land use in the region of influence. Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities are described in cumulative analysis (Chapter 4 of	and Architectural Resources, Cultural Practices, Land Use and Access, Socioeconomics, Water Resources

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				spaces to live at. I would like to see that stats. And I think for now that's all I got. I'm still going to do more research, and also with -- with all these resources and partners helping pull this EIS together, they should have the resources to reach out better than how they're reaching out now. Also, with the NEPA process and the new addition, the new update to the NEPA process of consulting indigenous knowledge to help guide this Section 106 in the EIS process. Mahalo.	the Draft EIS) but are not conducted by the Navy or NASA. These lands are leased by Department of Land and Natural Resources (DLNR) to Agribusiness Development Corporation (ADC) and Kekaha Agricultural Association (KAA) as described in Chapter 4. Refer to Section 4.1.5 (Past, Present, and Reasonably Foreseeable Future Actions) in regard to renewable and clean energy projects ongoing and slated for future development including the Mānā Plain Open Floodable Space Project and nature-based solutions. The Navy and NASA work to ensure that essential communities and individuals are informed and engaged during the entire process. Sections 3.2 (Archaeological and Architectural Resources) and 3.3 (Cultural Practices) of the Draft EIS describe this outreach for Section 106, Hawai‘i Revised Statutes (HRS) 6E, and Cultural Impact Assessment (CIA) processes. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ‘āina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-1	

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					discusses how the Navy will continue consultations with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, Native Hawaiian Organizations (NHOs), and interested organizations to develop measures to avoid, minimize, and mitigate effects to archaeological and architectural resources. EMM-4 discusses the development and continuation of the One Kaua'i Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders.	
71	Mike Long		1	My name is Mike Long. I live in Kauai for about 12 years. I talked to the commander, and most of the questions I asked, he had no answer for. He doesn't know what the budget was for last year. What kind of commander doesn't know what his budget is? It seems either -- I don't know -- false or not smart. I mean, he's got to know -- he -- he totally blew it off. And I know, like, several years ago, it was, like, $6 billion, and their rent they were paying was $1 a year. So the military gets everything, and Kauai gets nothing. And he says they're going to renegotiate, and it's going to be millions this time. And we don't know who's negotiating for Kauai. In the military industrial complex,	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The annual operating budget is outside the scope of this EIS, the scope of which is limited to the Proposed Action described in Chapter 2 of the Draft EIS. As described in Section 3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at a higher price than previous negotiations in the 1960s. The proposed real estate agreements would be at current fair market value and would be determined through negotiations with the Board	Socioeconomics, EIS Process

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				they fund politicians, and the politicians are going to be the ones negotiating on our behalf. And I don't feel like we will get a fair shake out of that. And he said it would be -- it would be market value for the next -- next lease. And the market value for that base would be no telling how many billions of dollars. No way they're going to play market value. And one other question I asked is what if we don't renew the lease? Didn't have a good answer for that one, either. And I don't like the fact that they're not wearing their uniforms. They're trying to be friendly. But if you're representing the military, if you're a commander, I'd be wearing my full commander outfit, wouldn't you? So I asked about giving comments, and he said: Oh, you have to do this. And I wanted to ask questions and make them answer my questions in front of everybody, because they didn't answer me. But they've already headed that off with a pass. So this is not a really good informative meeting. It's a presentation with a lot of nebulous terms that nobody's going to understand. And not knowing their budget for last year seems like a pretty big red flag to me.	of Land and Natural Resources (BLNR). The Draft EIS public scoping meetings will host a public comment hearing session in a public hearing-like platform.	
71	Mike Long		2	I hope our representatives do better than I think they're going to do, but I don't know. And according to the environmental study, everything they do harms the environment here. I mean, they're a military organization. They drop	The Navy complies with federal, state, and local regulations at PMRF as discussed in Section 1.3 (Background), Appendix E, and Section 6.1 (Consistency with Government Plans and Policies). The	Biological Resources, General Opposition to Navy

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				bombs in the water. They use sonar that affects the whales. And they say -- oh, they try to mitigate that. If there's whales around, they don't use the sonars, whatever. You know that's not true. They do what they're going to do no matter what. And we didn't even get to the part about all their tests are scripted. They spend billions of dollars a year, and they couldn't shoot down an enemy rocket if our lives depend on it, and they do. They -- all the tests are rigged so it looks like they're doing something good, and they're spending billions of dollars to do it. It just seems like a tremendous waste of money to me, and it has negative impact on Hawai'i. I don't think we should renew their lease at all, and I think they would have a big panic attack if we threatened to do that. So that's my comments. I hope it helps the people of Hawai'i. Thank you for your time. So how'd I do?	Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. As described in Chapters 1 and 2 of the Draft EIS, the scope of the EIS includes land-based leaseholds and easement lands; therefore, marine resources, including whales, are not covered in the scope of this EIS. Potential effects from the Proposed Action to marine resources, including the endangered monk seal and sea turtle that utilize the terrestrial region of influence (ROI), are described in Section 3.4 (Biological Resources) of the Draft EIS.	
72	Darlyne Mcleod		1	So my name is Darlyne McLeod, and I was thinking that a wonderful idea would be should we go with the alternative where the base/PMRF and NASA buy the land outright for fair market value, that some percentage of that money that would be made from that sale be applied towards affordable housing for the Island of Kauai, so that basically some of that money would be able to go back into the	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation and notes your preference for Alternative 2. Section 3.6 (Socioeconomics) of the Draft EIS includes an analysis of potential effects of the Proposed Action. The Navy and NASA are presenting enhanced management measures	Alternatives, Socioeconomics

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				community and there'd be a direct benefit to this sale.	(EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discusses the development and continuation of the One Kaua'i Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders.	
73	Sherri Cummings		1	My name is Sherri Cummings and I am a DHHL waitlister, Department of Hawaiian Home Land Trust 1920 Rehabilitation Act federal program. My concerns that I have is the ability to actually be part of the stakeholders who would have some type of benefit returned to them. Majority of our agriculture lands is on the west side of the Island of Kauai, and they are part of the lands that I believe could have some benefits regarding water transmission lines and nopportunities for us to be placed on lands that is being held in trust for us. And I think we should have beneficiary consultation to support the efforts of the Department of Hawaiian Home Land placing us on ag awards. The last ag award was in the year 1985. their leases and were promised tohave re-awarded leases, and that never happened. Four families died without being placed on	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including	Socioeconomics, Water Resources, Consultation, Land Use and Access

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				the list. And there's only one family today that has what we would consider insufficient water source for what he does on DHHL's lands. So that is my primary concern. And the reason why we don't have these ag awards words is basically the lands are -- were deemed lands that could not be farmable or have pastoral opportunities, because of lack of water. There were five families that were awarded in the early 1960s, and four families gave back and that never happened. Four families died without being placed on the list. And there's only one family today that has what we would consider insufficient water source for what he does on DHHL's lands. So that is my primary concern.	which easements are restrictive use for agricultural activities. These agricultural activities are described in cumulative analysis (Chapter 4 of the Draft EIS), but they are not conducted by the Navy or NASA. These lands are leased by the Department of Land and Natural Resources (DLNR) to Agribusiness Development Corporation (ADC) and Kekaha Agricultural Association (KAA) as described in Chapter 4. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to strengthen relationships with the Native Hawaiian community, and other interested stakeholders. EMM-5 also discusses the establishment of a Kauaʻi Navy-DLNR-Department of Hawaiian Homelands (DHHL)-ADC working group to collaboratively manage water resources in West Kauaʻi.	

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73	Sherri Cummings		2	I have other concerns regarding, you know, Niihau ohana having opportunities to have infrastructure to support themselves regarding water and electricity. And the Hawaiian families that was relocated from Niihau to Kauai, and they have the opportunities, as well, to have some sort of repatriation, for lack of better word, regarding how they were removed from their lands, my family's included. My mother's great-grandmother left the island, the first wave of native Niihau people. Her name was Kahinawe Keo, and she came with her mother, Ho'a'a, and her father Wahinealoha Keo. And so just trying to see if there's opportunities where Niihau people can benefit from what is happening on the -- the west end. And I think, you know, in all honesty, the DHHL beneficiaries should be at the priority, because we are actually still held by the federal government in a program that was -- that was passed congressionally in the year 1920 by our Prince Jonah Kuhio Kalanianaole. And as a condition of statehood, that rehabilitation act came with being a condition as a federal compact. So I -- I feel that for all intents and purposes, DHHL beneficiaries should be at the table in all decision making moving forward. Thank you.	As described in Section 3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at a higher price than previous negotiations in the 1960s. The proposed real estate agreements would be at current fair market value, and would be determined through negotiations with Board of Land and Natural Resources (BLNR) and could ultimately benefit the state, with approximately 20 percent of proceeds going first to Office of Hawaiian Affairs (OHA) (as described in Section 3.6 of the Draft EIS).	Land Use and Access, Cultural Practices, Consultation, Socioeconomics
74	Alice Parker		1	1-We definitely need to ensure a strong presence here on this westernmost outpost of the USA to deter potential armed incursions here with their object of attacking the USA.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Section 1.3 (Background) of the Draft EIS further	General Support for Navy

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					describes the Navy and NASA's land use and respective missions at PMRF.	
74	Alice Parker		2	2. Consider the local importance of our major garbage dump (Mount Trashmore, as some of us call it) - this will soon reach its mandated utmost height of 27 ft (I believe by 2030 or so) and this is a major consideration for Navy + NASA when planning future expansions.	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Finding a new location for a landfill is not within the scope of this EIS.	Proposed Action
74	Alice Parker		3	3) Thank you, mahalo, for this opportunity to enact with our residents	Thank you for participating in the scoping session for this project.	EIS Process
75	Sandy Phillips	Retired	1	Kauai desperately needs a new location for a landfill. Aparently no location can be found. Do you need all the easement land or could you consider part of that land be set aside for a new landfill? This is a project with great benefits for PMRF as well as the civilian population of the island. Thank you for considering the idea.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. Finding a new location for a landfill is not within the scope of this EIS.	Proposed Action

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76	Anonymous		1	I support option #3. Not renew military contract. There does not appear to be enough evidence to support the impact the military is having on our ocean! I do not mind the military on the land it just that the land is the bases for the onset of horrific devastation to our ocean with war games and military ocean practices.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. We value your concerns. Analysis of potential impacts from the No Action Alternative is included in the Draft EIS consistent with environmental regulatory requirements. Section 2.3.3 (Alternative 3) of the Draft EIS, includes the analysis of the No Action Alternative. The No Action Alternative consists of the process that would take place if the leases and easements are not reissued to the Navy and NASA by the state. Under the No Action Alternative and consistent with the terms of the lease, negotiations could result in decisions to remove all infrastructure from the leaseholds and easement lands.	General Opposition for Navy, Water Resources
76	Anonymous		2	I do not like NASA land negotion intertwined with the Navy. I support NASA to maintain their contract.	In consultation with Department of Land and Natural Resources (DLNR), the Navy and NASA determined that coordinating Hawai‘i Revised Statutes (HRS) Chapter 343 real estate efforts in one document would be more efficient for Board of Land and Natural Resources (BLNR) review.	EIS Process, General Support for NASA
77	Malcolmn Pryor	Resident Kekaha	1	Amazing new developments! I wanted to show my support and learn more.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Proposed Action	General Support

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					and alternatives are described in detail in Chapter 2 of the Draft EIS.	
78	Matt Sneed	PMRF	1	Kokeʻe NASA land use area has Kauai County labeled vehicles that appear abandoned. Will those items be removed prior to lease renewal	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The abandoned vehicles on NASA's leaseholds have been removed.	Hazardous Materials and Waste
79	Nākaielua Villatora Lobilina	E Ola Kākou Hawaiʻi	1	Provide Original Deed or Agreement (Document with the State to "obtain" lease.	On behalf of the Navy and NASA, the EIS team thanks you for your comments and appreciates your participation. Navy and NASA's original real estate agreements are included in Appendix C of the Draft EIS.	Proposed Action
79	Nākaielua Villatora Lobilina	E Ola Kākou Hawaiʻi	2	Under what laws does NASA & Navy operate under?	A detailed table of applicable laws, regulations, and polices governing the Navy and NASA can be found in Appendix E of the Draft EIS.	Relevant Laws and Regulations
79	Nākaielua Villatora Lobilina	E Ola Kākou Hawaiʻi	3	Concern for another 65 year lease of mismanagement and utilization of natural resources aina, wai/punawai/pohaku, etc.	Potential effects from the Proposed Action to biological resources are included in Section 3.4, to water resources in Section 3.7, and to archaeological and architectural resources in Section 3.2 of the Draft EIS. As described in Section 2.2 (Alternative Screening Process) of the Draft EIS, screening factors include long-term use of state land currently used to support Department of Defense (DoD) and NASA missions on Kauaʻi; noting that long term is anything over 25 years and not necessarily another 65-year	Biological Resources, Water Resources

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					lease term. Lease terms will be negotiated with the Board of Land and Natural Resources (BLNR).	
79	Nākaielua Villatora Lobilina	E Ola Kākou Hawaiʻi	4	What benefits to the kaiāulu does these renewal of the leases provide?	Potential effects from the Proposed Action to the community are discussed in Section 3.6 (Socioeconomics) in the Draft EIS. Section 1.7.5 (Ongoing Community Outreach) of the Draft EIS, describes how PMRF regularly coordinates with a diverse array of individuals and organizations. This engagement ensures active and meaningful communication with community stakeholders, fostering collaboration and addressing local concerns effectively.	Cultural Practices
79	Nākaielua Villatora Lobilina	E Ola Kākou Hawaiʻi	5	Does the military recognize the ke kanawai o Kō Pae ʻĀina Hawaii?	The EIS has been prepared consistent with the United States (U.S.) and State of Hawaiʻi's legal and regulatory framework.	Relevant Laws and Regulations
80	Mary Hannah		1	FYI - Many peoples in Kekaha have no vehicles and we would like to have re-cycle bins that we could walk to - in areas that would not bother residents. Yes - we/I have emailed Mel Rapoza.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional	Utilities

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					development. The area of analysis is described in Section 1.5 (Scope of Environmental Analysis) of the Draft EIS. Providing recycling bins in Kekaha is outside the scope of this EIS. The EIS team suggests contacting PMRF officials to voice concerns regarding additional recycling bins.	
81	Kainoa Nakazawa	Surfer/fisherman	1	Growing up on Kauai we had many opportunities to enjoy the beach with free acces. (behind pmrf ??? etc), now its restricted (because bin-laden). I understand PMRF gives access, with a screening process but what's the point? Nothing has ever happened to the base were not at war why can't the locals enjoy the beach free and clear. I grew up driving on teh beach with my family fishing, surfing, enjoying the beach that YOU dont OWN. By limiting our access you are restricting liming our access to our cultural resources and taking away from our keiki that should be able to enjoy and learn from kapuna. Please open up free access remove the poles on teh sand If WE CANT OWN the beach YOU CANT either.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows civilians to access PMRF using the main gate and affords unrestricted travel and access to Waiapuaʻa Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. The Navy and NASA are presenting enhanced management measures	Cultural Practices, Land Use and Access

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					(EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-2 discusses continued access for subsistence, habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Contact the PMRF Public Affairs Office for more information: (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.	
82	Lana Bilbo		1	1. This land is being used to support the activities of the base, which is training with rockets, missles and bombs. The impacts of the supported activities should be part of this EIS.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. The area of analysis is described in Section 1.5 (Scope of Environmental Analysis), and the aspects of the activities that occur in the Project Area (leaseholds and easement lands) are described in Section 1.3 (Background) of the Draft EIS. As described in Section 1.3.3 (Navy Mission at PMRF), all PMRF testing and training activities have all been previously addressed in the 2018 Hawaii-Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS) and the 1998 PMRF Enhanced Capability EIS. Both documents are publicly available and can be found on the PMRF KPGO EIS website (www.pmrf-kpgo-eis.com).	Area of Analysis

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82	Lana Bilbo		2	2. The EIS should consider a 4th alternative: the restoration of the Mana plains to wetlands and cultural practice areas. The base is what prevents this. There used to be a huge loko i'a.	The Draft EIS includes a description of purpose and need for the Proposed Action (Section 1.4) as well as the alternative screening process (Section 2.2). According to these criteria, Sections 2.3 (Alternatives Carried Forward for Detailed Analysis) and 2.4 (Alternatives Considered but Not Carried Forward for Detailed Analysis) of the Draft EIS identify alternatives. As described in Section 2.4 of the Draft EIS, a smaller footprint was considered, but it does not meet the screening factors in Section 2.2. Chapter 3 of the Draft EIS analyzes the potential effects for these alternatives carried forward for detailed analysis. As described in Section 1.3.6 (Environmental Management and Stewardship) and Section 4.1 (Introduction to Analysis), the Draft EIS also addresses the present and future Readiness and Environmental Protection Integration (REPI) Programs, including promoting regeneration of historic wetland habitat for endemic and endangered Hawaiian waterbirds on the Mānā Plain. A wetland delineation on leasehold lands of PMRF was conducted in support of this Draft EIS (Appendix N). Cultural practices in the Project Area are discussed in Section 3.3 (Cultural Practices) of the Draft EIS.	Alternatives

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82	Lana Bilbo		3	3. Advertising of this event was inadequate. There were more Navy staff than community members at all 3 events.	Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and H in the Draft EIS).	EIS Process
82	Lana Bilbo		4	4. The federally recognized Native Hawaiian Organization (NHOs) need to be consulted as part of the Section 106. This should be discussed openly at meetings. It was not in the first two.	As described in Sections 1.7.5 (Ongoing Community Coordination), 3.2 (Archaeological and Architectural Resources), and 3.3 (Cultural Practices), consultation with Native Hawaiian Organizations (NHOs) is ongoing. Consultations conducted as part of Section 106 are described in Section 3.2 of the Draft EIS. Native Hawaiian cultural practitioners were interviewed as part of preparation of the Cultural Impact Assessment (CIA), as described in Section 3.3 (Cultural Practices) and Appendix F in the Draft EIS.	Archaeological and Architectural Resources, Cultural Practices
82	Lana Bilbo		5	5. Traditional gathering rights ned to be respected without need to show "state" ID or being franted a permit or being followed around on base.	As described in Section 3.3 (Cultural Practices) of the Draft EIS, PMRF began the Morale, Welfare, and Recreation (MWR) Guest Card Program in 2005, which allows	Cultural Practices

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					civilians to access PMRF using the main gate and affords unrestricted travel and access to Waiapuaʻa Bay and beach areas. In August 2012, beach access along PMRF's north and south boundaries was adjusted to allow walk-on beach use for civilians without authorized access to PMRF. Walk-on access to PMRF's shorelines is typically carried out from either the north or south. As described in Sections 3.3 (Cultural Practices) and 3.5 (Land Use and Access) of the Draft EIS, the Proposed Action does not change public access at PMRF. Contact the PMRF Public Affairs Office for more information: (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.	
82	Lana Bilbo		6	6. The leases should be in your info packet for community review.	The leases are available in Appendix C of the Draft EIS.	Proposed Action
82	Lana Bilbo		7	7. Displacement of people born in Hawaii should be considered.	Potential effects to socioeconomics from the two action alternatives and the No Action Alternative are described in Section 3.6 (Socioeconomics) of the Draft EIS.	Socioeconomics
82	Lana Bilbo		8	8. The unfair $1 lease should be backpaid, in addition to the market value moving forward.	Backpay for existing leases and easements held by the Navy and NASA are not within the scope of this EIS. As described in Section 3.6 (Socioeconomics) in the Draft EIS, new real estate agreements would be at a higher price than previous negotiations in the 1960s. The proposed real estate agreements	Socioeconomics

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					would be at current fair market value, and would be determined through negotiations with the Board of Land and Natural Resources (BLNR).	
82	Lana Bilbo		9	9. any agriculture +work+ conservation done on the Mānā plain should restore the wai, the native wetland ecosystem, and be done via NHOs, to rectify the ongoing environmental injustice the base perpetuates.	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional development. The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities conducted by Kekaha Agricultural Association (KAA) and Agribusiness Development Corporation (ADC) are described in cumulative analysis (Chapter 4 of the Draft EIS). A history of land use in the Project Area is included in Section 1.3 (Background) and Section 3.5 (Land Use and Access). Also, please refer to Section 4.1.5 (Past, Present, and Reasonably	Biological Resources, Water Resources

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					Foreseeable Future Actions) in regard to renewable and clean energy projects ongoing and slated for future development, including the Mānā Plain Open Floodable Space Project and nature-based solutions. A wetland delineation on leasehold lands of PMRF was conducted in support of this Draft EIS (Appendix N). Regarding concerns related to environmental justice, please see the introductory paragraph on page I-1 of this appendix.	
82	Lana Bilbo		10	10. The public should have the opportunity + space to talk as a hui at these meetings so we can hear each others concerns.	The Navy and NASA work to support the access, notification, and ability for all stakeholders to contribute in the public scoping sessions. The format of the meeting was selected to provide the public with the greatest opportunity to interact with specialists working on the EIS. The Draft EIS public meeting will also include an opportunity for comment via a public hearing format.	EIS Process
82	Lana Bilbo		11	11. The psychological impact of the bases presence should be considered + studied. It is a physical reminder of the illegal occupation of the Hawaiian Islands. It is also being used to train genocidial militaries, including the Israeli Defense Forces. This is a disproportionate impact on the psychology of Hawaiian kanaka 'oiwi and Hawaiian nationals.	The Proposed Action is described in Chapter 2 of the Draft EIS, and includes two action alternatives, Alternative 1 which includes securing new real estate agreements (Section 2.3.1) and Alternative 2 which includes fee simple acquisition of current real estate agreements for leaseholds (Section 2.3.2). Neither action alternative includes additional	Public Health and Safety, Cultural Practices, General Opposition to Navy

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					development. Potential effects from the Proposed Action are described in Chapter 3.	
82	Lana Bilbo		12	12. If the agriculture on the mānā plain is using pesticides + heavy chemicals with studied or suspected health impacts, that has a disproportionate impact on Kekaha + the west side, which has a concentration of minorities in the community. The activities on these easements should not harm our community via the above.	The Navy and NASA's activities on leasehold and easement lands are described in Section 1.3 (Background) of the Draft EIS. Appendix C and D of the Draft EIS includes an additional breakdown of how these lands are used, including which easements are restrictive use for agricultural activities. These agricultural activities are described in cumulative analysis (Chapter 4 of the Draft EIS). A history of land use in the Project Area is included in Section 1.3 (Background) and Section 3.5 (Land Use and Access). Potential effects to Native Hawaiian communities are discussed in Section 3.3 (Cultural Practices) and Section 3.6 (Socioeconomics) of the Draft EIS.	Public Health and Safety
82	Lana Bilbo		13	13. The cultural practices that we can't do because of the ongoing water diversion to the wetland need to be considered. This includes, not limited to, paddling canoes, in the wetland, working loi + harvesting from it, sustaining + being sustained bu the loko i'a, the impacts of removing that habitat for the native birds, nene, hula, oli, prayer, etc.	Detailed discussion of cultural resources and practices regarding water can be found in Section 3.3 (Cultural Practices) of the Draft EIS. Cumulative effects from other activities in the vicinity of the Project Area are discussed in Chapter 4 of the Draft EIS.	Cultural Practices, Biological Resources, Land Use and Access, Water Resources
82	Lana Bilbo		14	14. A clear explanation of the facilities on Niihau + their relationship to this project should be provided.	Section 1.5 of the Draft EIS describes the scope of analysis. Facilities and activities on Niʻihau are not within	Proposed Action

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					the Project Area and so they are not within the scope of this EIS.	
82	Lana Bilbo		15	15. Should have independent 3rd party testing of all sites that have poison, toxic, polluting or contaminating materials or actions that are disclosed directly to the public w/o the Navy as intermediary.	Section 3.7 (Water Resources) of the Draft EIS describes current water monitoring procedures at PMRF and potential effects from the Proposed Action. Section 3.9 (Public Health and Safety) of the Draft EIS describes current practices and procedures in place to protect the public from activities in the project area, and potential effects from the Proposed Action.	Hazardous Materials, EIS Process
83	Sherri Cummings	Malama Anahola Kakoo Kaua	1	*Please address the needs of DHHL beneficiaries and have benefit consultation w/these associations of the Department of Hawaiian Homelands as well as the waitlist Association and NHOs that support the beneficiaries of the Federal Mandated Program 1920 Hawaiian Homes Commission Act.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Sections 3.6 (Socioeconomics) and 3.5 (Land Use and Access) of the Draft EIS include potential effects from the Proposed Action on local and Native Hawaiian communities. The Navy and NASA are presenting enhanced management measures (EMMs) under the action alternatives that propose additional property management protections for the ʻāina. EMMs are discussed in Chapter 5 and listed in Table 5.2-1 of the Draft EIS. Specifically, EMM-4 discusses the development and continuation of the One Kauaʻi Hui (Stakeholder Advisory Group) which seeks to establish regular communication channels to	Consultation, Socioeconomics, Land Use

Letter ID	Commenter Name	Organization	Comment Number	Original Public Scoping Comment[1]	EIS Team Response	Resource/ Section
					strengthen relationships with the Native Hawaiian community, and other interested stakeholders.	
83	Sherri Cummings	Malama Anahola Kakoo Kaua	2	*Speak to Native Hawaiian Niihau beneficiaries and have beneficiary consultation w/them as well.	Section 1.7 (Public and Agency Participation and Intergovernmental Coordination) of the Draft EIS describes the public review process in detail, including how the Navy and NASA solicited public participation during scoping. This outreach included a 40-day comment period (extended 10 days over the required minimum 30 days), personalized notification letters (174), and multiple consecutive newspaper and social media advertisements (also see Appendices G and L in the Draft EIS). A notification postcard was sent to a Niʻihau representative, and another will be sent following publication of the Draft EIS.	Consultation, Cultural Practices
84	Karen Ono	BLNR	1	Bird interaction or distraction @ Kokee.	On behalf of the Navy and NASA, the EIS team thanks you for your comment and appreciates your participation. Detailed discussion of avian wildlife within the Project Area can be found in Section 3.4 (Biological Resources) of the Draft EIS.	Biological Resources

Unedited Original Public Scoping Comments

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Scoping Comment Letter 0001

Consent for storing submitted data
True

First Name
Catherine

Last Name
Orlans

Add Me to the Project Mailing List
Yes

Street
1518 9th Ave

City
Honolulu

State
HI

Zip code
96815

Email
corlans@outlook.com

Organization/Affiliation (if any)

Comments

Even if an EIS is completed, the Hawaiʻi community across all islands have lost faith in the NAVY leadership specifically for their lack of transparency and how they have handled the Red Hill Fuel Spill on Oʻahu. We donʻt want more detrimental enrivonmental impacts on other islands. Go away. The community wants the land agreement expire. Landback for our inidigenous host culture and the ongoing illegal occupation of the Hawaiian Kingdom.

Add Attachments (optional)

Submitted on
05/08/2024

Scoping Comment Letter 0002

Consent for storing submitted data
True

First Name
Nicholas

Last Name
Franklin

Add Me to the Project Mailing List
Yes

Street
4617 Kuamoo Rd

City
Kapaa

State
HI

Zip code
96746

Email
fearlessfuzzy@gmail.com

Organization/Affiliation (if any)
HHSC-KR

Comments

Thank you for your service in protecting America. As a Kauai resident since 2019 I appreciate the contributions of this joint venture. Beyond the strategic mission, PMFR and NASA are the third largest employer on Kauai with over 1000 employees per public records, contribute to our national defense in ways I'm certain I will never know and provide community engagement with fireworks on July Forth. These are simplified and not all encompassing statements. I support ongoing leases for the joint strategic defense as currently established. I would encourage contributing further federal funds to repair roadways up Kokee, even past the NASA facility to Kalalau lookout, in a jesture to the community and tourist use. I also strongly support expanding active cell service across the Kokee State Park for safety and convenience. Fantastic that the entrance to your NASA facility has excellent service, but at my cabin lease or on most trails there is null...and as a well known local service oasis may be counterproductive to have frequent vehicles (I'm guilty) trolling around your entranceway just to check messages...or make emergency calls. In example: that unmarked road to the Makaha Ridge is pristine. Perhaps expanding that underlying situational readiness to the entire Kokee roadway is both generous and prudent. The number of civilians at any time in the Kokee Park would more reliably disperse up or down mountain in the event of enhanced military readiness with well maintained roadways.

Add Attachments (optional)

Submitted on
05/09/2024

Scoping Comment Letter 0003

Bill Zimmerman <zzest77@gmail.com> 5/10/2024 11:47 AM

continuation of military and NASA on Kauai

To info@pmrf-kpgo-eis.com

This should be a "no brainer" for anyone living on any Hawaii island:
With the very clear and continuing challenges by various Nations, SO similar to previous to the Pearl Harbor debacle, anyone, especially anyone on any Hawaii Island MUST recognize that those islands will be first and foremost in any and every aggressions by those bad actors wanting to harm USA; to think otherwise is to IGNORE the CLEAR History of the wonderful islands of Hawaii, as well as many other islands of the vast Pacific...
Love and Peace to all y'all,,,
VintageVNvet, now certifiably an antique far shore, but still remembering and still loving ALL the folx who were SO great and gracious to me in the Hawaiian places when I was there;;;

Scoping Comment Letter 0004

Consent for storing submitted data

True

First Name

Richard

Last Name

Spotts

Add Me to the Project Mailing List

Yes

Street

255 N 2790 E

City

Saint George

State

UT

Zip code

84790

Email

raspotts2@gmail.com

Organization/Affiliation (if any)

Comments

I appreciate this opportunity to provide scoping comments on this significant proposed action. At the outset, I believe that this and other federal planning and NEPA analysis processes should actively consider how the proposed action and alternatives may add to or help solve the climate and extinction crises. These overlapping crises pose an existential threat to humanity and the health of the biosphere. On the climate crisis, please review the attached IPPC report. This report summarizes the overwhelming international scientific consensus on the severity of the climate crisis and the urgent need to phase out the use and development of fossil fuels. On the extinction crisis, there are an increasing number of scientific reports on the rapid loss of biological diversity and how this loss undermines the stability, resilience, and productivity of the ecosystems upon which life on Earth depends. Overall, this compelling science demonstrates the urgent need for bold and innovative solutions. Questions arise like: how can fossil fuel use be reduced and replaced by clean, renewable energy sources? How can any destruction, degradation, or fragmentation of wildlife habitat be avoided, reduced, or successfully mitigated? How could construction materials be sourced from sustainable producers and practices? How could the use of any toxic chemicals be replaced by safer alternatives? How could gains in energy and water conservation be achieved? How could any harmful invasive plants be prevented, controlled, reduced, or eradicated? Please consider these questions

in moving forward. On this specific proposed action, I am concerned about the many ESA listed plant and animal species in Hawaii and how this proposed action and alternatives may affect them. Hawaii is an epicenter for the extinction crisis. I hope this NEPA analysis will help identify the least damaging but feasible alternative to best advance the protection and recovery of those species. I also hope that any energy used will come from clean, renewable sources. Health is the ultimate wealth, and we all need a healthy environment. Thank you very much for your kind consideration of my comments and the attachment.

Add Attachments (optional)

climate_change_ipcc_2023_summary_report.pdf

Submitted on

5/11/2024

ipcc

INTERGOVERNMENTAL PANEL ON climate change

CLIMATE CHANGE 2023
Synthesis Report

Summary for Policymakers

A Report of the Intergovernmental Panel on Climate Change

WMO UNEP

CLIMATE CHANGE 2023

Synthesis Report

Summary for Policymakers

Edited by

The Core Writing Team
Synthesis Report
IPCC

Hoesung Lee
Chairman
IPCC

José Romero
Head, Technical Support Unit
IPCC

Core Writing Team

Hoesung Lee (Chair), Katherine Calvin (USA), Dipak Dasgupta (India/USA), Gerhard Krinner (France/Germany), Aditi Mukherji (India), Peter Thorne (Ireland/United Kingdom), Christopher Trisos (South Africa), José Romero (Switzerland), Paulina Aldunce (Chile), Ko Barrett (USA), Gabriel Blanco (Argentina), William W. L. Cheung (Canada), Sarah L. Connors (France/United Kingdom), Fatima Denton (The Gambia), Aïda Diongue-Niang (Senegal), David Dodman (Jamaica/United Kingdom/Netherlands), Matthias Garschagen (Germany), Oliver Geden (Germany), Bronwyn Hayward (New Zealand), Christopher Jones (United Kingdom), Frank Jotzo (Australia), Thelma Krug (Brazil), Rodel Lasco (Philippines), June-Yi Lee (Republic of Korea), Valérie Masson-Delmotte (France), Malte Meinshausen (Australia/Germany), Katja Mintenbeck (Germany), Abdalah Mokssit (Morocco), Friederike E. L. Otto (United Kingdom/Germany), Minal Pathak (India), Anna Pirani (Italy), Elvira Poloczanska (United Kingdom/Australia), Hans-Otto Pörtner (Germany), Aromar Revi (India), Debra C. Roberts (South Africa), Joyashree Roy (India/Thailand), Alex C. Ruane (USA), Jim Skea (United Kingdom), Priyadarshi R. Shukla (India), Raphael Slade (United Kingdom), Aimée Slangen (The Netherlands), Youba Sokona (Mali), Anna A. Sörensson (Argentina), Melinda Tignor (USA/Germany), Detlef van Vuuren (The Netherlands), Yi-Ming Wei (China), Harald Winkler (South Africa), Panmao Zhai (China), Zinta Zommers (Latvia)

Technical Support Unit for the Synthesis Report

José Romero (Switzerland), Jinmi Kim (Republic of Korea), Erik F. Haites (Canada), Yonghun Jung (Republic of Korea), Robert Stavins (USA), Arlene Birt (USA), Meeyoung Ha (Republic of Korea), Dan Jezreel A. Orendain (Philippines), Lance Ignon (USA), Semin Park (Republic of Korea), Youngin Park (Republic of Korea)

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Extended Writing Team

Jean-Charles Hourcade (France), Francis X. Johnson (Thailand/Sweden), Shonali Pachauri (Austria/India), Nicholas P. Simpson (South Africa/Zimbabwe), Chandni Singh (India), Adelle Thomas (Bahamas), Edmond Totin (Benin)

Review Editors

Paola Arias (Colombia), Mercedes Bustamante (Brazil), Ismail Elgizouli (Sudan), Gregory Flato (Canada), Mark Howden (Australia), Carlos Méndez (Venezuela), Joy Jacqueline Pereira (Malaysia), Ramón Pichs-Madruga (Cuba), Steven K Rose (USA), Yamina Saheb (Algeria/France), Roberto Sánchez Rodríguez (Mexico), Diana Ürge-Vorsatz (Hungary), Cunde Xiao (China), Noureddine Yassaa (Algeria)

Contributing Authors

Andrés Alegría (Germany/Honduras), Kyle Armour (USA), Birgit Bednar-Friedl (Austria), Kornelis Blok (The Netherlands), Guéladio Cissé (Switzerland/Mauritania/France), Frank Dentener (EU/Netherlands), Siri Eriksen (Norway), Erich Fischer (Switzerland), Gregory Garner (USA), Céline Guivarch (France), Marjolijn Haasnoot (The Netherlands), Gerrit Hansen (Germany), Mathias Hauser (Switzerland), Ed Hawkins (UK), Tim Hermans (The Netherlands), Robert Kopp (USA), Noëmie Leprince-Ringuet (France), Jared Lewis (Australia/New Zealand), Debora Ley (Mexico/Guatemala), Chloé Ludden (Germany/France), Leila Niamir (Iran/The Netherlands/Austria), Zebedee Nicholls (Australia), Shreya Some (India/Thailand), Sophie Szopa (France), Blair Trewin (Australia), Kaj-Ivar van der Wijst (The Netherlands), Gundula Winter (The Netherlands/Germany), Maximilian Witting (Germany)

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Hoesung Lee (Chair, IPCC), Amjad Abdulla (Maldives), Edvin Aldrian (Indonesia), Ko Barrett (United States of America), Eduardo Calvo (Peru), Carlo Carraro (Italy), Diriba Korecha Dadi (Ethiopia), Fatima Driouech (Morocco), Andreas Fischlin (Switzerland), Jan Fuglestvedt (Norway), Thelma Krug (Brazil), Nagmeldin G.E. Mahmoud (Sudan), Valérie Masson-Delmotte (France), Carlos Méndez (Venezuela), Joy Jacqueline Pereira (Malaysia), Ramón Pichs-Madruga (Cuba), Hans-Otto Pörtner (Germany), Andy Reisinger (New Zealand), Debra C. Roberts (South Africa), Sergey Semenov (Russian Federation), Priyadarshi Shukla (India), Jim Skea (United Kingdom), Youba Sokona (Mali), Kiyoto Tanabe (Japan), Muhammad Irfan Tariq (Pakistan), Diana Ürge-Vorsatz (Hungary), Carolina Vera (Argentina), Pius Yanda (United Republic of Tanzania), Noureddine Yassaa (Algeria), Taha M. Zatari (Saudi Arabia), Panmao Zhai (China)

Visual Conception and Information Design

Arlene Birt (USA), Meeyoung Ha (Republic of Korea)

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"Fog opening the dawn" by Chung Jin Sil

The Weather and Climate Photography & Video Contest 2021, Korea Meteorological Administration
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THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE

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Sources cited in this Synthesis Report

References for material contained in this report are given in curly brackets {} at the end of each paragraph.

In the Summary for Policymakers, the references refer to the numbers of the sections, figures, tables and boxes in the underlying Introduction and Topics of this Synthesis Report.

In the Introduction and Sections of the longer report, the references refer to the contributions of the Working Groups I, II and III (WGI, WGII, WGIII) to the Sixth Assessment Report and other IPCC Reports (in italicized curly brackets), or to other sections of the Synthesis Report itself (in round brackets).

The following abbreviations have been used:
SPM: Summary for Policymakers
TS: Technical Summary
ES: Executive Summary of a chapter
Numbers denote specific chapters and sections of a report.

Other IPCC reports cited in this Synthesis Report:
SR1.5: Global Warming of 1.5°C
SRCCL: Climate Change and Land
SROCC: The Ocean and Cryosphere in a Changing Climate

Summary for Policymakers

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Introduction

This Synthesis Report (SYR) of the IPCC Sixth Assessment Report (AR6) summarises the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation. It integrates the main findings of the Sixth Assessment Report (AR6) based on contributions from the three Working Groups[1], and the three Special Reports[2]. The summary for Policymakers (SPM) is structured in three parts: SPM.A Current Status and Trends, SPM.B Future Climate Change, Risks, and Long-Term Responses, and SPM.C Responses in the Near Term[3].

This report recognizes the interdependence of climate, ecosystems and biodiversity, and human societies; the value of diverse forms of knowledge; and the close linkages between climate change adaptation, mitigation, ecosystem health, human well-being and sustainable development, and reflects the increasing diversity of actors involved in climate action.

Based on scientific understanding, key findings can be formulated as statements of fact or associated with an assessed level of confidence using the IPCC calibrated language[4].

---

1 The three Working Group contributions to AR6 are: AR6 Climate Change 2021: The Physical Science Basis; AR6 Climate Change 2022: Impacts, Adaptation and Vulnerability; and AR6 Climate Change 2022: Mitigation of Climate Change. Their assessments cover scientific literature accepted for publication respectively by 31 January 2021, 1 September 2021 and 11 October 2021.

2 The three Special Reports are: Global Warming of 1.5°C (2018): an IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty (SR1.5); Climate Change and Land (2019): an IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems (SRCCL); and The Ocean and Cryosphere in a Changing Climate (2019) (SROCC). The Special Reports cover scientific literature accepted for publication respectively by 15 May 2018, 7 April 2019 and 15 May 2019.

3 In this report, the near term is defined as the period until 2040. The long term is defined as the period beyond 2040.

4 Each finding is grounded in an evaluation of underlying evidence and agreement. The IPCC calibrated language uses five qualifiers to express a level of confidence: very low, low, medium, high and very high, and typeset in italics, for example, *medium confidence*. The following terms are used to indicate the assessed likelihood of an outcome or a result: virtually certain 99–100% probability, very likely 90–100%, likely 66–100%, more likely than not >50–100%, about as likely as not 33–66%, unlikely 0–33%, very unlikely 0–10%, exceptionally unlikely 0–1%. Additional terms (extremely likely 95–100%; and extremely unlikely 0–5%) are also used when appropriate. Assessed likelihood is typeset in italics, e.g., *very likely*. This is consistent with AR5 and the other AR6 Reports.

A. Current Status and Trends

Observed Warming and its Causes

A.1 Human activities, principally through emissions of greenhouse gases, have unequivocally caused global warming, with global surface temperature reaching 1.1°C above 1850-1900 in 2011-2020. Global greenhouse gas emissions have continued to increase, with unequal historical and ongoing contributions arising from unsustainable energy use, land use and land-use change, lifestyles and patterns of consumption and production across regions, between and within countries, and among individuals (*high confidence*). {*2.1, Figure 2.1, Figure 2.2*}

A.1.1 Global surface temperature was 1.09 [0.95 to 1.20]°C[5] higher in 2011–2020 than 1850–1900[6], with larger increases over land (1.59 [1.34 to 1.83]°C) than over the ocean (0.88 [0.68 to 1.01]°C). Global surface temperature in the first two decades of the 21st century (2001–2020) was 0.99 [0.84 to 1.10]°C higher than 1850–1900. Global surface temperature has increased faster since 1970 than in any other 50-year period over at least the last 2000 years (*high confidence*). {*2.1.1, Figure 2.1*}

A.1.2 The *likely* range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019[7] is 0.8°C to 1.3°C, with a best estimate of 1.07°C. Over this period, it is *likely* that well-mixed greenhouse gases (GHGs) contributed a warming of 1.0°C to 2.0°C[8], and other human drivers (principally aerosols) contributed a cooling of 0.0°C to 0.8°C, natural (solar and volcanic) drivers changed global surface temperature by –0.1°C to +0.1°C, and internal variability changed it by –0.2°C to +0.2°C. {*2.1.1, Figure 2.1*}

A.1.3 Observed increases in well-mixed GHG concentrations since around 1750 are unequivocally caused by GHG emissions from human activities over this period. Historical cumulative net CO_2 emissions from 1850 to 2019 were 2400 ± 240 $GtCO_2$ of which more than half (58%) occurred between 1850 and 1989, and about 42% occurred between 1990 and 2019 (*high confidence*). In 2019, atmospheric CO_2 concentrations (410 parts per million) were higher than at any time in at least 2 million years (*high confidence*), and concentrations of methane (1866 parts per billion) and nitrous oxide (332 parts per billion) were higher than at any time in at least 800,000 years (*very high confidence*). {*2.1.1, Figure 2.1*}

A.1.4 Global net anthropogenic GHG emissions have been estimated to be 59 ± 6.6 $GtCO_2$-eq[9] in 2019, about 12% (6.5 $GtCO_2$-eq) higher than in 2010 and 54% (21 $GtCO_2$-eq) higher than in 1990, with the largest share and growth in gross GHG emissions occurring in CO_2 from fossil fuels combustion and industrial processes (CO_2-FFI) followed by methane, whereas the highest relative growth occurred in fluorinated gases (F-gases), starting from low levels in 1990. Average annual GHG emissions during 2010–2019 were higher than in any previous decade on record, while the rate of growth between 2010 and 2019 (1.3% yr^{-1}) was lower than that between 2000 and 2009 (2.1% yr^{-1}). In 2019, approximately 79% of global GHG

[5] Ranges given throughout the SPM represent *very likely* ranges (5–95% range) unless otherwise stated.

[6] The estimated increase in global surface temperature since AR5 is principally due to further warming since 2003–2012 (0.19 [0.16 to 0.22] °C). Additionally, methodological advances and new datasets have provided a more complete spatial representation of changes in surface temperature, including in the Arctic. These and other improvements have also increased the estimate of global surface temperature change by approximately 0.1°C, but this increase does not represent additional physical warming since AR5.

[7] The period distinction with A.1.1 arises because the attribution studies consider this slightly earlier period. The observed warming to 2010–2019 is 1.06 [0.88 to 1.21]°C.

[8] Contributions from emissions to the 2010–2019 warming relative to 1850–1900 assessed from radiative forcing studies are: CO_2 0.8 [0.5 to 1.2]°C; methane 0.5 [0.3 to 0.8]°C; nitrous oxide 0.1 [0.0 to 0.2]°C and fluorinated gases 0.1 [0.0 to 0.2]°C. {*2.1.1*}

[9] GHG emission metrics are used to express emissions of different greenhouse gases in a common unit. Aggregated GHG emissions in this report are stated in CO_2-equivalents (CO_2-eq) using the Global Warming Potential with a time horizon of 100 years (GWP100) with values based on the contribution of Working Group I to the AR6. The AR6 WGI and WGIII reports contain updated emission metric values, evaluations of different metrics with regard to mitigation objectives, and assess new approaches to aggregating gases. The choice of metric depends on the purpose of the analysis and all GHG emission metrics have limitations and uncertainties, given that they simplify the complexity of the physical climate system and its response to past and future GHG emissions. {*2.1.1*}

emissions came from the sectors of energy, industry, transport, and buildings together and 22%[10] from agriculture, forestry and other land use (AFOLU). Emissions reductions in CO_2-FFI due to improvements in energy intensity of GDP and carbon intensity of energy, have been less than emissions increases from rising global activity levels in industry, energy supply, transport, agriculture and buildings. (*high confidence*) {*2.1.1*}

A.1.5 Historical contributions of CO_2 emissions vary substantially across regions in terms of total magnitude, but also in terms of contributions to CO_2-FFI and net CO_2 emissions from land use, land-use change and forestry (CO_2-LULUCF). In 2019, around 35% of the global population live in countries emitting more than 9 tCO_2-eq per capita[11] (excluding CO_2-LULUCF) while 41% live in countries emitting less than 3 tCO_2-eq per capita; of the latter a substantial share lacks access to modern energy services. Least Developed Countries (LDCs) and Small Island Developing States (SIDS) have much lower per capita emissions (1.7 tCO_2-eq and 4.6 tCO_2-eq, respectively) than the global average (6.9 tCO_2-eq), excluding CO_2-LULUCF. The 10% of households with the highest per capita emissions contribute 34–45% of global consumption-based household GHG emissions, while the bottom 50% contribute 13–15%. (*high confidence*) {*2.1.1, Figure 2.2*}

Observed Changes and Impacts

A.2 Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred. Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (*high confidence*). Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected (*high confidence*). {*2.1, Table 2.1, Figure 2.2, Figure 2.3*} (*Figure SPM.1*)

A.2.1 It is unequivocal that human influence has warmed the atmosphere, ocean and land. Global mean sea level increased by 0.20 [0.15 to 0.25] m between 1901 and 2018. The average rate of sea level rise was 1.3 [0.6 to 2.1] mm yr^{-1} between 1901 and 1971, increasing to 1.9 [0.8 to 2.9] mm yr^{-1} between 1971 and 2006, and further increasing to 3.7 [3.2 to 4.2] mm yr^{-1} between 2006 and 2018 (*high confidence*). Human influence was *very likely* the main driver of these increases since at least 1971. Evidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has further strengthened since AR5. Human influence has *likely* increased the chance of compound extreme events since the 1950s, including increases in the frequency of concurrent heatwaves and droughts (*high confidence*). {*2.1.2, Table 2.1, Figure 2.3, Figure 3.4*} (*Figure SPM.1*)

A.2.2 Approximately 3.3 to 3.6 billion people live in contexts that are highly vulnerable to climate change. Human and ecosystem vulnerability are interdependent. Regions and people with considerable development constraints have high vulnerability to climatic hazards. Increasing weather and climate extreme events have exposed millions of people to acute food insecurity[12] and reduced water security, with the largest adverse impacts observed in many locations and/or communities in Africa, Asia, Central and South America, LDCs, Small Islands and the Arctic, and globally for Indigenous Peoples, small-scale food producers and low-income households. Between 2010 and 2020, human mortality from floods, droughts and storms was 15 times higher in highly vulnerable regions, compared to regions with very low vulnerability. (*high confidence*) {*2.1.2, 4.4*} (*Figure SPM.1*)

A.2.3 Climate change has caused substantial damages, and increasingly irreversible losses, in terrestrial, freshwater, cryospheric, and coastal and open ocean ecosystems (*high confidence*). Hundreds of local losses of species have been driven by increases in the magnitude of heat extremes (*high confidence*) with mass mortality events recorded on land and in the ocean (*very high confidence*). Impacts on some ecosystems are approaching irreversibility such as the impacts of hydrological changes resulting from the retreat of glaciers, or the changes in some mountain (*medium confidence*) and Arctic ecosystems driven by permafrost thaw (*high confidence*). {*2.1.2, Figure 2.3*} (*Figure SPM.1*)

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[10] GHG emission levels are rounded to two significant digits; as a consequence, small differences in sums due to rounding may occur. {*2.1.1*}

[11] Territorial emissions.

[12] Acute food insecurity can occur at any time with a severity that threatens lives, livelihoods or both, regardless of the causes, context or duration, as a result of shocks risking determinants of food security and nutrition, and is used to assess the need for humanitarian action. {*2.1*}

A.2.4 Climate change has reduced food security and affected water security, hindering efforts to meet Sustainable Development Goals (*high confidence*). Although overall agricultural productivity has increased, climate change has slowed this growth over the past 50 years globally (*medium confidence*), with related negative impacts mainly in mid- and low latitude regions but positive impacts in some high latitude regions (*high confidence*). Ocean warming and ocean acidification have adversely affected food production from fisheries and shellfish aquaculture in some oceanic regions *(high confidence)*. Roughly half of the world's population currently experience severe water scarcity for at least part of the year due to a combination of climatic and non-climatic drivers (*medium confidence*). {*2.1.2, Figure 2.3*} (*Figure SPM.1*)

A.2.5 In all regions increases in extreme heat events have resulted in human mortality and morbidity (*very high confidence*). The occurrence of climate-related food-borne and water-borne diseases (*very high confidence*) and the incidence of vector-borne diseases (*high confidence*) have increased. In assessed regions, some mental health challenges are associated with increasing temperatures (*high confidence*), trauma from extreme events (*very high confidence*), and loss of livelihoods and culture (*high confidence*). Climate and weather extremes are increasingly driving displacement in Africa, Asia, North America (*high confidence*), and Central and South America (*medium confidence*), with small island states in the Caribbean and South Pacific being disproportionately affected relative to their small population size (*high confidence*). {*2.1.2, Figure 2.3*} (*Figure SPM.1*)

A.2.6 Climate change has caused widespread adverse impacts and related losses and damages[13] to nature and people that are unequally distributed across systems, regions and sectors. Economic damages from climate change have been detected in climate-exposed sectors, such as agriculture, forestry, fishery, energy, and tourism. Individual livelihoods have been affected through, for example, destruction of homes and infrastructure, and loss of property and income, human health and food security, with adverse effects on gender and social equity. (*high confidence*) {*2.1.2*} (*Figure SPM.1*)

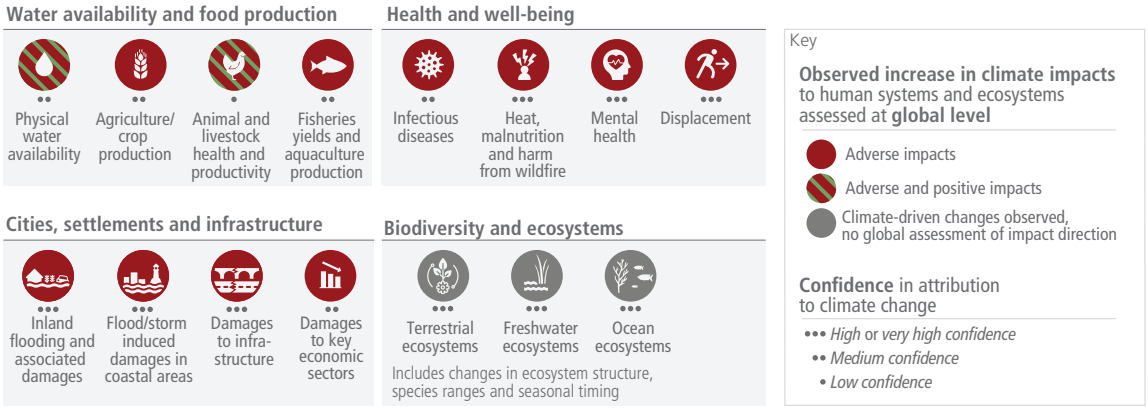
A.2.7 In urban areas, observed climate change has caused adverse impacts on human health, livelihoods and key infrastructure. Hot extremes have intensified in cities. Urban infrastructure, including transportation, water, sanitation and energy systems have been compromised by extreme and slow-onset events[14], with resulting economic losses, disruptions of services and negative impacts to well-being. Observed adverse impacts are concentrated amongst economically and socially marginalised urban residents. (*high confidence*) {*2.1.2*}

[13] In this report, the term 'losses and damages' refers to adverse observed impacts and/or projected risks and can be economic and/or non-economic (see Annex I: Glossary).

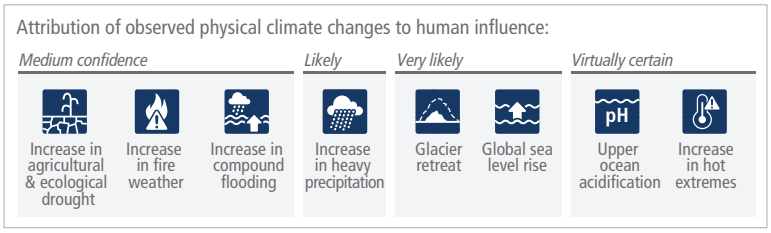
[14] Slow-onset events are described among the climatic-impact drivers of the AR6 WGI and refer to the risks and impacts associated with e.g., increasing temperature means, desertification, decreasing precipitation, loss of biodiversity, land and forest degradation, glacial retreat and related impacts, ocean acidification, sea level rise and salinization. {*2.1.2*}

Adverse impacts from human-caused climate change will continue to intensify

a) Observed widespread and substantial impacts and related losses and damages attributed to climate change



b) Impacts are driven by changes in multiple physical climate conditions, which are increasingly attributed to human influence



c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near term

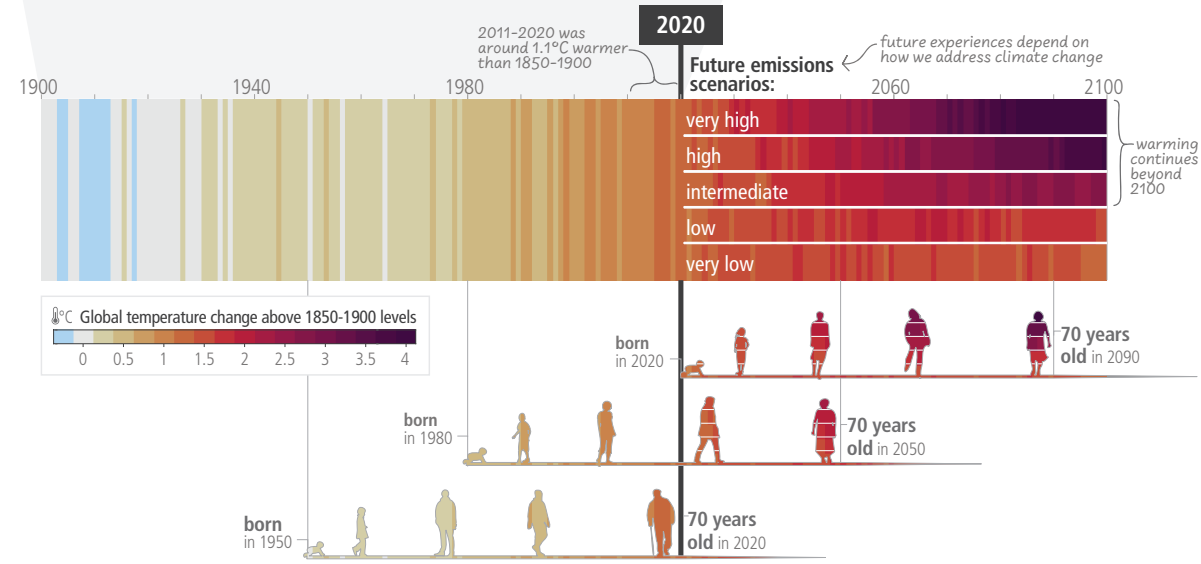


Figure SPM.1: (a) Climate change has already caused widespread impacts and related losses and damages on human systems and altered terrestrial, freshwater and ocean ecosystems worldwide. Physical water availability includes balance of water available from various sources including ground water, water quality and demand for water. Global mental health and displacement assessments reflect only assessed regions. Confidence levels reflect the assessment of attribution of the observed impact to climate change. **(b)** Observed impacts are connected to physical climate changes including many that have been attributed to human influence such as the selected climatic impact-drivers shown. Confidence and likelihood levels reflect the assessment of attribution of the observed climatic impact-driver to human influence. **(c)** Observed (1900–2020) and projected (2021–2100) changes in global surface temperature (relative to 1850-1900), which are linked to changes in climate conditions and impacts, illustrate how the climate has already changed and will change along the lifespan of three

representative generations (born in 1950, 1980 and 2020). Future projections (2021–2100) of changes in global surface temperature are shown for very low (SSP1-1.9), low (SSP1-2.6), intermediate (SSP2-4.5), high (SSP3-7.0) and very high (SSP5-8.5) GHG emissions scenarios. Changes in annual global surface temperatures are presented as 'climate stripes', with future projections showing the human-caused long-term trends and continuing modulation by natural variability (represented here using observed levels of past natural variability). Colours on the generational icons correspond to the global surface temperature stripes for each year, with segments on future icons differentiating possible future experiences. {*2.1*, *2.1.2*, *Figure 2.1*, *Table 2.1*, *Figure 2.3*, *Cross-Section Box.2*, *3.1*, *Figure 3.3*, *4.1*, *4.3*} (*Box SPM.1*)

Current Progress in Adaptation and Gaps and Challenges

A.3 Adaptation planning and implementation has progressed across all sectors and regions, with documented benefits and varying effectiveness. Despite progress, adaptation gaps exist, and will continue to grow at current rates of implementation. Hard and soft limits to adaptation have been reached in some ecosystems and regions. Maladaptation is happening in some sectors and regions. Current global financial flows for adaptation are insufficient for, and constrain implementation of, adaptation options, especially in developing countries (*high confidence*). {*2.2, 2.3*}

A.3.1 Progress in adaptation planning and implementation has been observed across all sectors and regions, generating multiple benefits (*very high confidence*). Growing public and political awareness of climate impacts and risks has resulted in at least 170 countries and many cities including adaptation in their climate policies and planning processes (*high confidence*). {*2.2.3*}

A.3.2 Effectiveness[15] of adaptation in reducing climate risks[16] is documented for specific contexts, sectors and regions (*high confidence*). Examples of effective adaptation options include: cultivar improvements, on-farm water management and storage, soil moisture conservation, irrigation, agroforestry, community-based adaptation, farm and landscape level diversification in agriculture, sustainable land management approaches, use of agroecological principles and practices and other approaches that work with natural processes (*high confidence*). Ecosystem-based adaptation[17] approaches such as urban greening, restoration of wetlands and upstream forest ecosystems have been effective in reducing flood risks and urban heat (*high confidence*). Combinations of non-structural measures like early warning systems and structural measures like levees have reduced loss of lives in case of inland flooding (*medium confidence*). Adaptation options such as disaster risk management, early warning systems, climate services and social safety nets have broad applicability across multiple sectors (*high confidence*). {*2.2.3*}

A.3.3 Most observed adaptation responses are fragmented, incremental[18], sector-specific and unequally distributed across regions. Despite progress, adaptation gaps exist across sectors and regions, and will continue to grow under current levels of implementation, with the largest adaptation gaps among lower income groups. (*high confidence*) {*2.3.2*}

A.3.4 There is increased evidence of maladaptation in various sectors and regions. Maladaptation especially affects marginalised and vulnerable groups adversely. (*high confidence*) {*2.3.2*}

A.3.5 Soft limits to adaptation are currently being experienced by small-scale farmers and households along some low-lying coastal areas (*medium confidence*) resulting from financial, governance, institutional and policy constraints (*high confidence*). Some tropical, coastal, polar and mountain ecosystems have reached hard adaptation limits (*high confidence*). Adaptation does not prevent all losses and damages, even with effective adaptation and before reaching soft and hard limits (*high confidence*). {*2.3.2*}

[15] Effectiveness refers here to the extent to which an adaptation option is anticipated or observed to reduce climate-related risk. {*2.2.3*}

[16] See Annex I: Glossary. {*2.2.3*}

[17] Ecosystem-based Adaptation (EbA) is recognized internationally under the Convention on Biological Diversity (CBD14/5). A related concept is Nature-based Solutions (NbS), see Annex I: Glossary.

[18] Incremental adaptations to change in climate are understood as extensions of actions and behaviours that already reduce the losses or enhance the benefits of natural variations in extreme weather/climate events. {*2.3.2*}

A.3.6 Key barriers to adaptation are limited resources, lack of private sector and citizen engagement, insufficient mobilization of finance (including for research), low climate literacy, lack of political commitment, limited research and/or slow and low uptake of adaptation science, and low sense of urgency. There are widening disparities between the estimated costs of adaptation and the finance allocated to adaptation (*high confidence*). Adaptation finance has come predominantly from public sources, and a small proportion of global tracked climate finance was targeted to adaptation and an overwhelming majority to mitigation (*very high confidence*). Although global tracked climate finance has shown an upward trend since AR5, current global financial flows for adaptation, including from public and private finance sources, are insufficient and constrain implementation of adaptation options, especially in developing countries (*high confidence*). Adverse climate impacts can reduce the availability of financial resources by incurring losses and damages and through impeding national economic growth, thereby further increasing financial constraints for adaptation, particularly for developing and least developed countries (*medium confidence*). {*2.3.2, 2.3.3*}

Box SPM.1 The use of scenarios and modelled pathways in the AR6 Synthesis Report

Modelled scenarios and pathways[19] are used to explore future emissions, climate change, related impacts and risks, and possible mitigation and adaptation strategies and are based on a range of assumptions, including socio-economic variables and mitigation options. These are quantitative projections and are neither predictions nor forecasts. Global modelled emission pathways, including those based on cost effective approaches contain regionally differentiated assumptions and outcomes, and have to be assessed with the careful recognition of these assumptions. Most do not make explicit assumptions about global equity, environmental justice or intra-regional income distribution. IPCC is neutral with regard to the assumptions underlying the scenarios in the literature assessed in this report, which do not cover all possible futures.[20] {*Cross-Section Box.2*}

WGI assessed the climate response to five illustrative scenarios based on Shared Socio-economic Pathways (SSPs)[21] that cover the range of possible future development of anthropogenic drivers of climate change found in the literature. High and very high GHG emissions scenarios (SSP3-7.0 and SSP5-8.5[22]) have CO_2 emissions that roughly double from current levels by 2100 and 2050, respectively. The intermediate GHG emissions scenario (SSP2-4.5) has CO_2 emissions remaining around current levels until the middle of the century. The very low and low GHG emissions scenarios (SSP1-1.9 and SSP1-2.6) have CO_2 emissions declining to net zero around 2050 and 2070, respectively, followed by varying levels of net negative CO_2 emissions. In addition, Representative Concentration Pathways (RCPs)[23] were used by WGI and WGII to assess regional climate changes, impacts and risks. In WGIII, a large number of global modelled emissions pathways were assessed, of which 1202 pathways were categorised based on their assessed global warming over the 21st century; categories range from pathways that limit warming to 1.5°C with more than 50% likelihood (noted >50% in this report) with no or limited overshoot (C1) to pathways that exceed 4°C (C8). {*Cross-Section Box.2*} (*Box SPM.1, Table 1*)

Global warming levels (GWLs) relative to 1850–1900 are used to integrate the assessment of climate change and related impacts and risks since patterns of changes for many variables at a given GWL are common to all scenarios considered and independent of timing when that level is reached. {*Cross-Section Box.2*}

[19] In the literature, the terms pathways and scenarios are used interchangeably, with the former more frequently used in relation to climate goals. WGI primarily used the term scenarios and WGIII mostly used the term modelled emission and mitigation pathways. The SYR primarily uses scenarios when referring to WGI and modelled emission and mitigation pathways when referring to WGIII.

[20] Around half of all modelled global emission pathways assume cost-effective approaches that rely on least-cost mitigation/abatement options globally. The other half looks at existing policies and regionally and sectorally differentiated actions.

[21] SSP-based scenarios are referred to as SSPx-y, where 'SSPx' refers to the Shared Socioeconomic Pathway describing the socioeconomic trends underlying the scenarios, and 'y' refers to the level of radiative forcing (in watts per square metre, or W m^{-2}) resulting from the scenario in the year 2100. {*Cross-Section Box.2*}

[22] Very high emissions scenarios have become *less likely* but cannot be ruled out. Warming levels >4°C may result from very high emissions scenarios, but can also occur from lower emission scenarios if climate sensitivity or carbon cycle feedbacks are higher than the best estimate. {*3.1.1*}

[23] RCP-based scenarios are referred to as RCPy, where 'y' refers to the level of radiative forcing (in watts per square metre, or W m^{-2}) resulting from the scenario in the year 2100. The SSP scenarios cover a broader range of greenhouse gas and air pollutant futures than the RCPs. They are similar but not identical, with differences in concentration trajectories. The overall effective radiative forcing tends to be higher for the SSPs compared to the RCPs with the same label (*medium confidence*). {*Cross-Section Box.2*}

Box SPM.1, Table 1: Description and relationship of scenarios and modelled pathways considered across AR6 Working Group reports. {*Cross-Section Box.2 Figure 1*}

Category in WGIII	Category description	GHG emissions scenarios (SSPx-y*) in WGI & WGII	RCPy** in WGI & WGII
C1	limit warming to 1.5°C (>50%) with no or limited overshoot***	Very low (SSP1-1.9)	
C2	return warming to 1.5°C (>50%) after a high overshoot***		
C3	limit warming to 2°C (>67%)	Low (SSP1-2.6)	RCP2.6
C4	limit warming to 2°C (>50%)		
C5	limit warming to 2.5°C (>50%)		
C6	limit warming to 3°C (>50%)	Intermediate (SSP2-4.5)	RCP 4.5
C7	limit warming to 4°C (>50%)	High (SSP3-7.0)	
C8	exceed warming of 4°C (>50%)	Very high (SSP5-8.5)	RCP 8.5

* See footnote 21 for the SSPx-y terminology.

** See footnote 23 for the RCPy terminology.

*** Limited overshoot refers to exceeding 1.5°C global warming by up to about 0.1°C, high overshoot by 0.1°C-0.3°C, in both cases for up to several decades.

Current Mitigation Progress, Gaps and Challenges

A.4 Policies and laws addressing mitigation have consistently expanded since AR5. Global GHG emissions in 2030 implied by nationally determined contributions (NDCs) announced by October 2021 make it *likely* that warming will exceed 1.5°C during the 21st century and make it harder to limit warming below 2°C. There are gaps between projected emissions from implemented policies and those from NDCs and finance flows fall short of the levels needed to meet climate goals across all sectors and regions. (*high confidence*) {*2.2, 2.3, Figure 2.5, Table 2.2*}

A.4.1 The UNFCCC, Kyoto Protocol, and the Paris Agreement are supporting rising levels of national ambition. The Paris Agreement, adopted under the UNFCCC, with near universal participation, has led to policy development and target-setting at national and sub-national levels, in particular in relation to mitigation, as well as enhanced transparency of climate action and support (*medium confidence*). Many regulatory and economic instruments have already been deployed successfully (*high confidence*). In many countries, policies have enhanced energy efficiency, reduced rates of deforestation and accelerated technology deployment, leading to avoided and in some cases reduced or removed emissions (*high confidence*). Multiple lines of evidence suggest that mitigation policies have led to several[24] Gt CO_2-eq yr^{-1} of avoided global emissions (*medium confidence*). At least 18 countries have sustained absolute production-based GHG and consumption-based CO_2 reductions[25] for longer than 10 years. These reductions have only partly offset global emissions growth (*high confidence*). {*2.2.1, 2.2.2*}

A.4.2 Several mitigation options, notably solar energy, wind energy, electrification of urban systems, urban green infrastructure, energy efficiency, demand-side management, improved forest and crop/grassland management, and reduced food waste and loss, are technically viable, are becoming increasingly cost effective and are generally supported by the

[24] At least 1.8 $GtCO_2$-eq yr^{-1} can be accounted for by aggregating separate estimates for the effects of economic and regulatory instruments. Growing numbers of laws and executive orders have impacted global emissions and were estimated to result in 5.9 $GtCO_2$-eq yr^{-1} less emissions in 2016 than they otherwise would have been. (*medium confidence*) {*2.2.2*}

[25] Reductions were linked to energy supply decarbonisation, energy efficiency gains, and energy demand reduction, which resulted from both policies and changes in economic structure (*high confidence*). {*2.2.2*}

public. From 2010 to 2019 there have been sustained decreases in the unit costs of solar energy (85%), wind energy (55%), and lithium-ion batteries (85%), and large increases in their deployment, e.g., >10× for solar and >100× for electric vehicles (EVs), varying widely across regions. The mix of policy instruments that reduced costs and stimulated adoption includes public R&D, funding for demonstration and pilot projects, and demand-pull instruments such as deployment subsidies to attain scale. Maintaining emission-intensive systems may, in some regions and sectors, be more expensive than transitioning to low emission systems. (*high confidence*) {*2.2.2, Figure 2.4*}

A.4.3 A substantial 'emissions gap' exists between global GHG emissions in 2030 associated with the implementation of NDCs announced prior to COP26[26] and those associated with modelled mitigation pathways that limit warming to 1.5°C (>50%) with no or limited overshoot or limit warming to 2°C (>67%) assuming immediate action (*high confidence*). This would make it *likely* that warming will exceed 1.5°C during the 21st century (*high confidence*). Global modelled mitigation pathways that limit warming to 1.5°C (>50%) with no or limited overshoot or limit warming to 2°C (>67%) assuming immediate action imply deep global GHG emissions reductions this decade (*high confidence*) (see SPM Box 1, Table 1, B.6)[27]. Modelled pathways that are consistent with NDCs announced prior to COP26 until 2030 and assume no increase in ambition thereafter have higher emissions, leading to a median global warming of 2.8 [2.1 to 3.4] °C by 2100 (*medium confidence*). Many countries have signalled an intention to achieve net zero GHG or net zero CO_2 by around mid-century but pledges differ across countries in terms of scope and specificity, and limited policies are to date in place to deliver on them. {*2.3.1, Table 2.2, Figure 2.5, Table 3.1, 4.1*}

A.4.4 Policy coverage is uneven across sectors (*high confidence*). Policies implemented by the end of 2020 are projected to result in higher global GHG emissions in 2030 than emissions implied by NDCs, indicating an 'implementation gap' (*high confidence*). Without a strengthening of policies, global warming of 3.2 [2.2 to 3.5] °C is projected by 2100 (*medium confidence*). {*2.2.2, 2.3.1, 3.1.1, Figure 2.5*} (*Box SPM.1, Figure SPM.5*)

A.4.5 The adoption of low-emission technologies lags in most developing countries, particularly least developed ones, due in part to limited finance, technology development and transfer, and capacity (*medium confidence*). The magnitude of climate finance flows has increased over the last decade and financing channels have broadened but growth has slowed since 2018 (*high confidence*). Financial flows have developed heterogeneously across regions and sectors (*high confidence*). Public and private finance flows for fossil fuels are still greater than those for climate adaptation and mitigation (*high confidence*). The overwhelming majority of tracked climate finance is directed towards mitigation, but nevertheless falls short of the levels needed to limit warming to below 2°C or to 1.5°C across all sectors and regions (see C7.2) (*very high confidence*). In 2018, public and publicly mobilised private climate finance flows from developed to developing countries were below the collective goal under the UNFCCC and Paris Agreement to mobilise USD 100 billion per year by 2020 in the context of meaningful mitigation action and transparency on implementation (*medium confidence*). {*2.2.2, 2.3.1, 2.3.3*}

[26] Due to the literature cutoff date of WGIII, the additional NDCs submitted after 11 October 2021 are not assessed here. {*Footnote 32 in the Longer Report*}

[27] Projected 2030 GHG emissions are 50 (47–55) $GtCO_2$-eq if all conditional NDC elements are taken into account. Without conditional elements, the global emissions are projected to be approximately similar to modelled 2019 levels at 53 (50–57) $GtCO_2$-eq. {*2.3.1, Table 2.2*}

B. Future Climate Change, Risks, and Long-Term Responses

Future Climate Change

B.1 Continued greenhouse gas emissions will lead to increasing global warming, with the best estimate of reaching 1.5°C in the near term in considered scenarios and modelled pathways. Every increment of global warming will intensify multiple and concurrent hazards (*high confidence*). Deep, rapid, and sustained reductions in greenhouse gas emissions would lead to a discernible slowdown in global warming within around two decades, and also to discernible changes in atmospheric composition within a few years (*high confidence*). {*Cross-Section Boxes 1 and 2, 3.1, 3.3, Table 3.1, Figure 3.1, 4.3*} (*Figure SPM.2, Box SPM.1*)

B.1.1 Global warming[28] will continue to increase in the near term (2021–2040) mainly due to increased cumulative CO_2 emissions in nearly all considered scenarios and modelled pathways. In the near term, global warming *is more likely than not* to reach 1.5°C even under the very low GHG emission scenario (SSP1-1.9) and *likely* or *very likely* to exceed 1.5°C under higher emissions scenarios. In the considered scenarios and modelled pathways, the best estimates of the time when the level of global warming of 1.5°C is reached lie in the near term[29]. Global warming declines back to below 1.5°C by the end of the 21st century in some scenarios and modelled pathways (see B.7). The assessed climate response to GHG emissions scenarios results in a best estimate of warming for 2081–2100 that spans a range from 1.4°C for a very low GHG emissions scenario (SSP1-1.9) to 2.7°C for an intermediate GHG emissions scenario (SSP2-4.5) and 4.4°C for a very high GHG emissions scenario (SSP5-8.5)[30], with narrower uncertainty ranges[31] than for corresponding scenarios in AR5. {*Cross-Section Boxes 1 and 2, 3.1.1, 3.3.4, Table 3.1, 4.3*} (*Box SPM.1*)

B.1.2 Discernible differences in trends of global surface temperature between contrasting GHG emissions scenarios (SSP1-1.9 and SSP1-2.6 vs. SSP3-7.0 and SSP5-8.5) would begin to emerge from natural variability[32] within around 20 years. Under these contrasting scenarios, discernible effects would emerge within years for GHG concentrations, and sooner for air quality improvements, due to the combined targeted air pollution controls and strong and sustained methane emissions reductions. Targeted reductions of air pollutant emissions lead to more rapid improvements in air quality within years compared to reductions in GHG emissions only, but in the long term, further improvements are projected in scenarios that combine efforts to reduce air pollutants as well as GHG emissions[33]. (*high confidence*) {*3.1.1*} (*Box SPM.1*)

B.1.3 Continued emissions will further affect all major climate system components. With every additional increment of global warming, changes in extremes continue to become larger. Continued global warming is projected to further intensify the global water cycle, including its variability, global monsoon precipitation, and very wet and very dry weather and

[28] Global warming (see Annex I: Glossary) is here reported as running 20-year averages, unless stated otherwise, relative to 1850–1900. Global surface temperature in any single year can vary above or below the long-term human-caused trend, due to natural variability. The internal variability of global surface temperature in a single year is estimated to be about ±0.25°C (5–95% range, *high confidence*). The occurrence of individual years with global surface temperature change above a certain level does not imply that this global warming level has been reached. {*4.3, Cross-Section Box.2*}

[29] Median five-year interval at which a 1.5°C global warming level is reached (50% probability) in categories of modelled pathways considered in WGIII is 2030–2035. By 2030, global surface temperature in any individual year could exceed 1.5°C relative to 1850–1900 with a probability between 40% and 60%, across the five scenarios assessed in WGI (*medium confidence*). In all scenarios considered in WGI except the very high emissions scenario (SSP5-8.5), the midpoint of the first 20-year running average period during which the assessed average global surface temperature change reaches 1.5°C lies in the first half of the 2030s. In the very high GHG emissions scenario, the midpoint is in the late 2020s. {*3.1.1, 3.3.1, 4.3*} (*Box SPM.1*)

[30] The best estimates [and *very likely* ranges] for the different scenarios are: 1.4 [1.0 to 1.8]°C (SSP1-1.9); 1.8 [1.3 to 2.4]°C (SSP1-2.6); 2.7 [2.1 to 3.5]°C (SSP2-4.5); 3.6 [2.8 to 4.6]°C (SSP3-7.0); and 4.4 [3.3 to 5.7]°C (SSP5-8.5). {*3.1.1*} (*Box SPM.1*)

[31] Assessed future changes in global surface temperature have been constructed, for the first time, by combining multi-model projections with observational constraints and the assessed equilibrium climate sensitivity and transient climate response. The uncertainty range is narrower than in the AR5 thanks to improved knowledge of climate processes, paleoclimate evidence and model-based emergent constraints. {*3.1.1*}

[32] See Annex I: Glossary. Natural variability includes natural drivers and internal variability. The main internal variability phenomena include El Niño-Southern Oscillation, Pacific Decadal Variability and Atlantic Multi-decadal Variability. {*4.3*}

[33] Based on additional scenarios.

climate events and seasons (*high confidence*). In scenarios with increasing CO_2 emissions, natural land and ocean carbon sinks are projected to take up a decreasing proportion of these emissions (*high confidence*). Other projected changes include further reduced extents and/or volumes of almost all cryospheric elements[34] (*high confidence*), further global mean sea level rise (*virtually certain*), and increased ocean acidification (*virtually certain*) and deoxygenation (*high confidence*). {*3.1.1*, *3.3.1*, *Figure 3.4*} (*Figure SPM.2*)

B.1.4 With further warming, every region is projected to increasingly experience concurrent and multiple changes in climatic impact-drivers. Compound heatwaves and droughts are projected to become more frequent, including concurrent events across multiple locations (*high confidence*). Due to relative sea level rise, current 1-in-100 year extreme sea level events are projected to occur at least annually in more than half of all tide gauge locations by 2100 under all considered scenarios (*high confidence*). Other projected regional changes include intensification of tropical cyclones and/or extratropical storms (*medium confidence*), and increases in aridity and fire weather *(medium* to *high confidence*). {*3.1.1*, *3.1.3*}

B.1.5 Natural variability will continue to modulate human-caused climate changes, either attenuating or amplifying projected changes, with little effect on centennial-scale global warming (*high confidence*). These modulations are important to consider in adaptation planning, especially at the regional scale and in the near term. If a large explosive volcanic eruption were to occur[35], it would temporarily and partially mask human-caused climate change by reducing global surface temperature and precipitation for one to three years (*medium confidence*). {*4.3*}

[34] Permafrost, seasonal snow cover, glaciers, the Greenland and Antarctic Ice Sheets, and Arctic sea ice.

[35] Based on 2500-year reconstructions, eruptions with a radiative forcing more negative than –1 W m^{-2}, related to the radiative effect of volcanic stratospheric aerosols in the literature assessed in this report, occur on average twice per century. {*4.3*}

With every increment of global warming, regional changes in mean climate and extremes become more widespread and pronounced

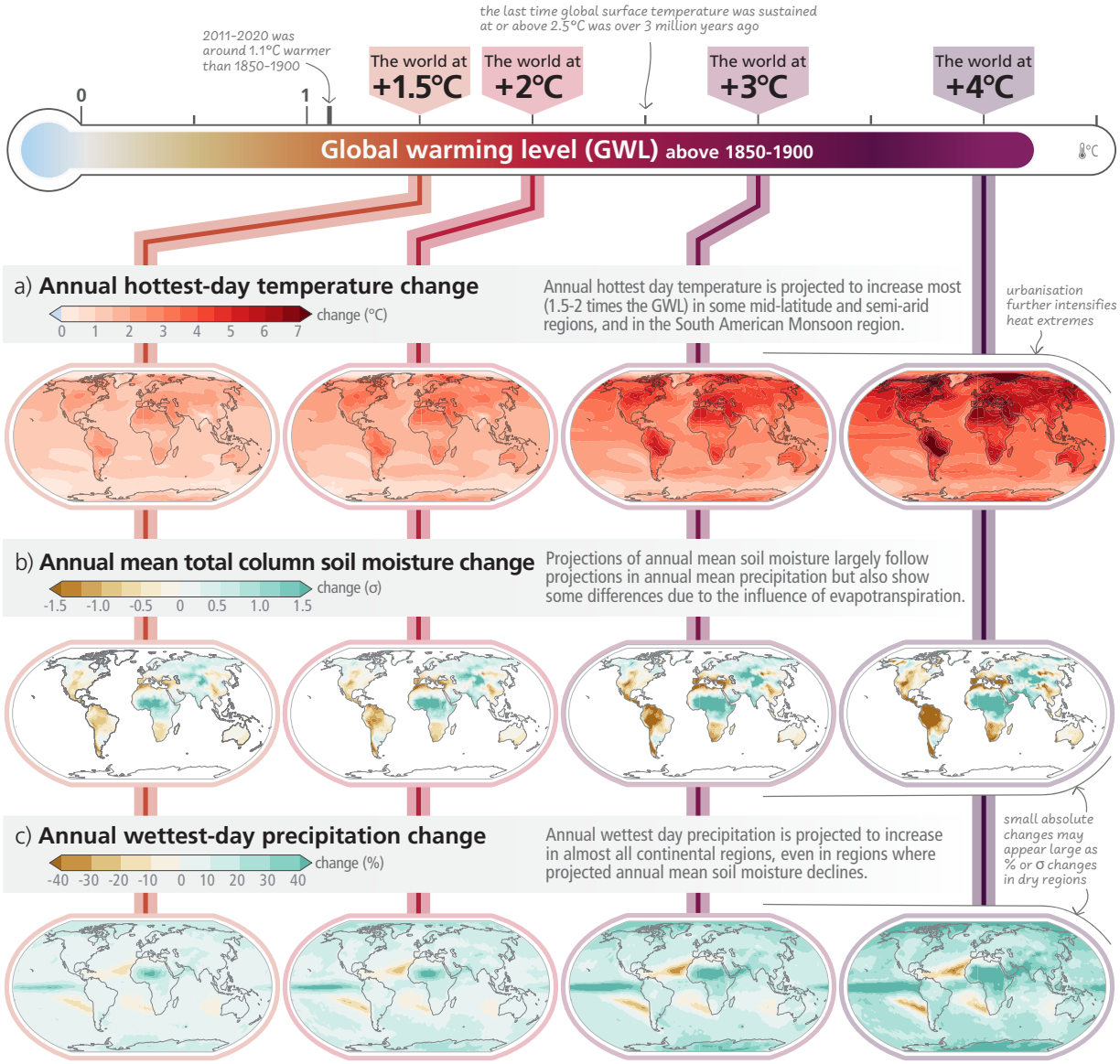


Figure SPM.2: Projected changes of annual maximum daily maximum temperature, annual mean total column soil moisture and annual maximum 1-day precipitation at global warming levels of 1.5°C, 2°C, 3°C, and 4°C relative to 1850–1900. Projected **(a)** annual maximum daily temperature change (°C), **(b)** annual mean total column soil moisture change (standard deviation), **(c)** annual maximum 1-day precipitation change (%). The panels show CMIP6 multi-model median changes. In panels (b) and (c), large positive relative changes in dry regions may correspond to small absolute changes. In panel (b), the unit is the standard deviation of interannual variability in soil moisture during 1850–1900. Standard deviation is a widely used metric in characterising drought severity. A projected reduction in mean soil moisture by one standard deviation corresponds to soil moisture conditions typical of droughts that occurred about once every six years during 1850–1900. The WGI Interactive Atlas (https://interactive-atlas.ipcc.ch/) can be used to explore additional changes in the climate system across the range of global warming levels presented in this figure. {*Figure 3.1, Cross-Section Box.2*}

Climate Change Impacts and Climate-Related Risks

B.2 For any given future warming level, many climate-related risks are higher than assessed in AR5, and projected long-term impacts are up to multiple times higher than currently observed (*high confidence*). Risks and projected adverse impacts and related losses and damages from climate change escalate with every increment of global warming (*very high confidence*). Climatic and non-climatic risks will increasingly interact, creating compound and cascading risks that are more complex and difficult to manage (*high confidence*). {*Cross-Section Box.2, 3.1, 4.3, Figure 3.3, Figure 4.3*} (*Figure SPM.3, Figure SPM.4*)

B.2.1 In the near term, every region in the world is projected to face further increases in climate hazards (*medium* to *high confidence*, depending on region and hazard), increasing multiple risks to ecosystems and humans (*very high confidence*). Hazards and associated risks expected in the near term include an increase in heat-related human mortality and morbidity (*high confidence*), food-borne, water-borne, and vector-borne diseases (*high confidence*), and mental health challenges[36] (*very high confidence*), flooding in coastal and other low-lying cities and regions (*high confidence*), biodiversity loss in land, freshwater and ocean ecosystems (*medium* to *very high confidence*, depending on ecosystem), and a decrease in food production in some regions (*high confidence*). Cryosphere-related changes in floods, landslides, and water availability have the potential to lead to severe consequences for people, infrastructure and the economy in most mountain regions (*high confidence*). The projected increase in frequency and intensity of heavy precipitation (*high confidence*) will increase rain-generated local flooding (*medium confidence*). {*Figure 3.2, Figure 3.3, 4.3, Figure 4.3*} (*Figure SPM.3, Figure SPM.4*)

B.2.2 Risks and projected adverse impacts and related losses and damages from climate change will escalate with every increment of global warming (*very high confidence*). They are higher for global warming of 1.5°C than at present, and even higher at 2°C (*high confidence*). Compared to the AR5, global aggregated risk levels[37] (Reasons for Concern[38]) are assessed to become high to very high at lower levels of global warming due to recent evidence of observed impacts, improved process understanding, and new knowledge on exposure and vulnerability of human and natural systems, including limits to adaptation (*high confidence*). Due to unavoidable sea level rise (see also B.3), risks for coastal ecosystems, people and infrastructure will continue to increase beyond 2100 (*high confidence*). {*3.1.2, 3.1.3, Figure 3.4, Figure 4.3*} (*Figure SPM.3, Figure SPM.4*)

B.2.3 With further warming, climate change risks will become increasingly complex and more difficult to manage. Multiple climatic and non-climatic risk drivers will interact, resulting in compounding overall risk and risks cascading across sectors and regions. Climate-driven food insecurity and supply instability, for example, are projected to increase with increasing global warming, interacting with non-climatic risk drivers such as competition for land between urban expansion and food production, pandemics and conflict. (*high confidence*) {*3.1.2, 4.3, Figure 4.3*}

B.2.4 For any given warming level, the level of risk will also depend on trends in vulnerability and exposure of humans and ecosystems. Future exposure to climatic hazards is increasing globally due to socio-economic development trends including migration, growing inequality and urbanisation. Human vulnerability will concentrate in informal settlements and rapidly growing smaller settlements. In rural areas vulnerability will be heightened by high reliance on climate-sensitive livelihoods. Vulnerability of ecosystems will be strongly influenced by past, present, and future patterns of unsustainable consumption and production, increasing demographic pressures, and persistent unsustainable use and management of land, ocean, and water. Loss of ecosystems and their services has cascading and long-term impacts on people globally, especially for Indigenous Peoples and local communities who are directly dependent on ecosystems to meet basic needs. (*high confidence*) {*Cross-Section Box.2 Figure 1c, 3.1.2, 4.3*}

[36] In all assessed regions.

[37] Undetectable risk level indicates no associated impacts are detectable and attributable to climate change; moderate risk indicates associated impacts are both detectable and attributable to climate change with at least *medium confidence*, also accounting for the other specific criteria for key risks; high risk indicates severe and widespread impacts that are judged to be high on one or more criteria for assessing key risks; and very high risk level indicates very high risk of severe impacts and the presence of significant irreversibility or the persistence of climate-related hazards, combined with limited ability to adapt due to the nature of the hazard or impacts/risks. {*3.1.2*}

[38] The Reasons for Concern (RFC) framework communicates scientific understanding about accrual of risk for five broad categories. RFC1: Unique and threatened systems: ecological and human systems that have restricted geographic ranges constrained by climate-related conditions and have high endemism or other distinctive properties. RFC2: Extreme weather events: risks/impacts to human health, livelihoods, assets and ecosystems from extreme weather events. RFC3: Distribution of impacts: risks/impacts that disproportionately affect particular groups due to uneven distribution of physical climate change hazards, exposure or vulnerability. RFC4: Global aggregate impacts: impacts to socio-ecological systems that can be aggregated globally into a single metric. RFC5: Large-scale singular events: relatively large, abrupt and sometimes irreversible changes in systems caused by global warming. See also Annex I: Glossary. {*3.1.2, Cross-Section Box.2*}

Future climate change is projected to increase the severity of impacts across natural and human systems and will increase regional differences

Examples of impacts without additional adaptation

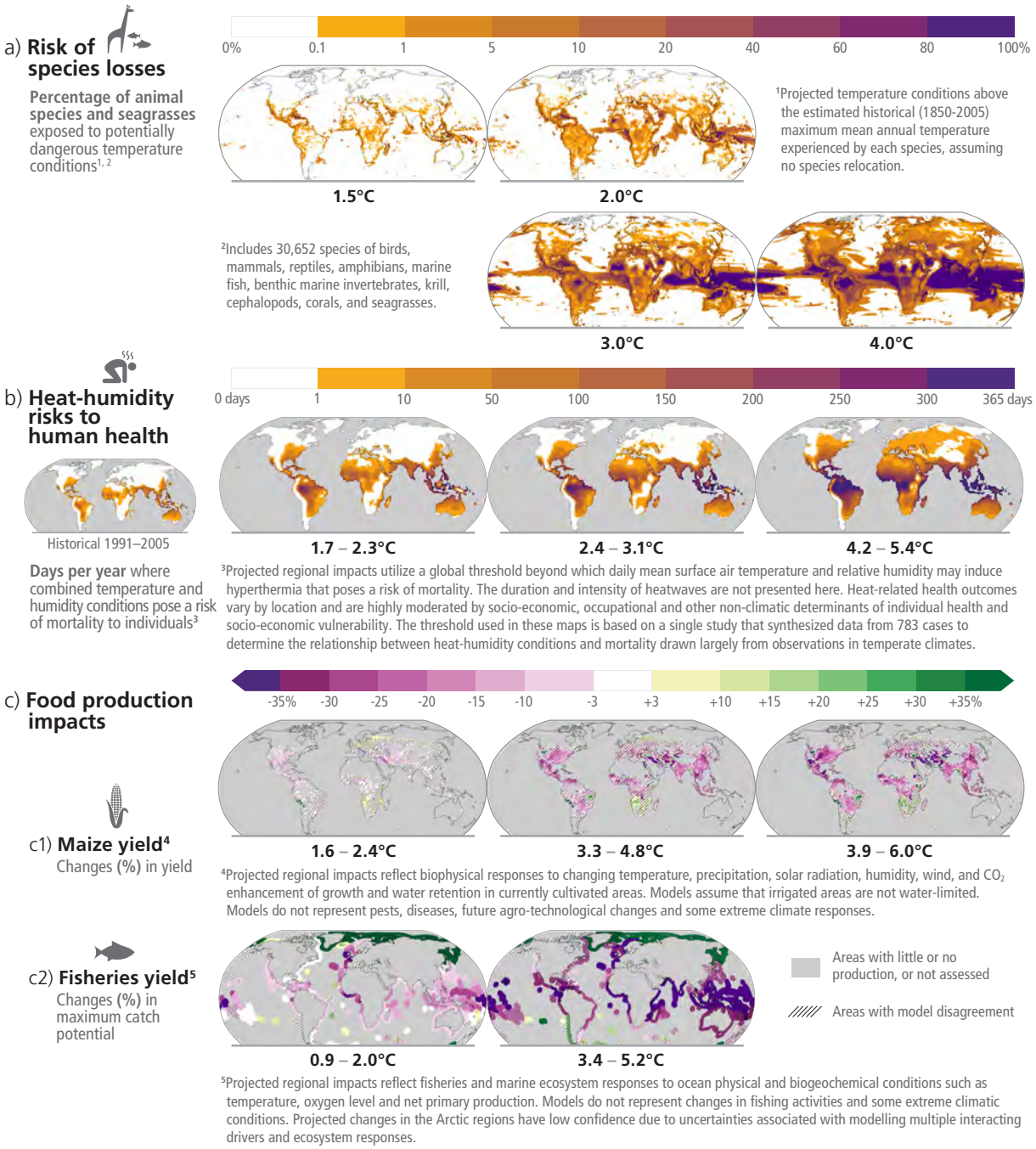


Figure SPM.3: Projected risks and impacts of climate change on natural and human systems at different global warming levels (GWLs) relative to 1850-1900 levels. Projected risks and impacts shown on the maps are based on outputs from different subsets of Earth system and impact models that were used to project each impact indicator without additional adaptation. WGII provides further assessment of the impacts on human and natural systems using these projections and additional lines of evidence. **(a)** Risks of species losses as indicated by the percentage of assessed species exposed to potentially dangerous temperature conditions, as defined by conditions beyond the estimated historical (1850–2005) maximum mean annual temperature experienced by each species, at GWLs of 1.5°C, 2°C, 3°C and 4°C. Underpinning projections of temperature are from 21 Earth system models and do not consider extreme events impacting ecosystems such as the Arctic. **(b)** Risks to human health as indicated by the days per year of population exposure to hyperthermic conditions that pose a risk of mortality from surface air temperature and humidity conditions for historical period (1991–2005) and at GWLs of 1.7°C–2.3°C (mean = 1.9°C; 13 climate models), 2.4°C–3.1°C (2.7°C; 16 climate models) and 4.2°C–5.4°C (4.7°C; 15 climate models). Interquartile ranges of GWLs by 2081–2100 under RCP2.6, RCP4.5 and RCP8.5. The presented index is consistent with common features found in many indices included within WGI and WGII assessments. **(c)** Impacts on food production: (c1) Changes in maize yield by 2080–2099 relative to 1986–2005 at projected GWLs of 1.6°C–2.4°C (2.0°C), 3.3°C–4.8°C (4.1°C) and 3.9°C–6.0°C (4.9°C). Median yield changes from an ensemble of 12 crop models, each driven by bias-adjusted outputs from 5 Earth system models, from the Agricultural Model Intercomparison and Improvement Project (AgMIP) and the Inter-Sectoral Impact Model Intercomparison Project (ISIMIP). Maps depict

2080–2099 compared to 1986–2005 for current growing regions (>10 ha), with the corresponding range of future global warming levels shown under SSP1-2.6, SSP3-7.0 and SSP5-8.5, respectively. Hatching indicates areas where <70% of the climate-crop model combinations agree on the sign of impact. (c2) Change in maximum fisheries catch potential by 2081–2099 relative to 1986–2005 at projected GWLs of 0.9°C–2.0°C (1.5°C) and 3.4°C–5.2°C (4.3°C). GWLs by 2081–2100 under RCP2.6 and RCP8.5. Hatching indicates where the two climate-fisheries models disagree in the direction of change. Large relative changes in low yielding regions may correspond to small absolute changes. Biodiversity and fisheries in Antarctica were not analysed due to data limitations. Food security is also affected by crop and fishery failures not presented here. {*3.1.2, Figure 3.2, Cross-Section Box.2*} (*Box SPM.1*)

Risks are increasing with every increment of warming

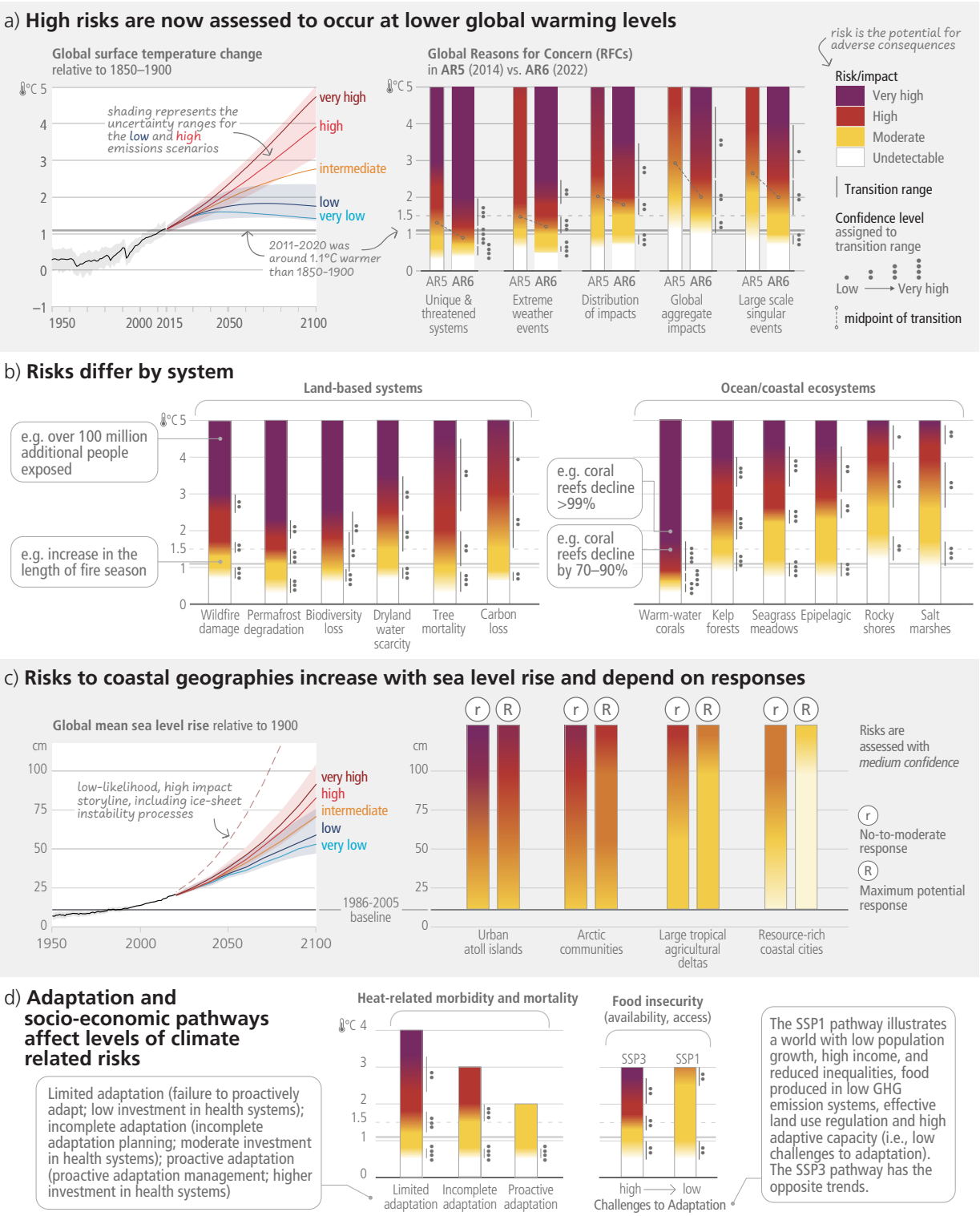


Figure SPM.4: Subset of assessed climate outcomes and associated global and regional climate risks. The burning embers result from a literature based expert elicitation. **Panel (a): Left** – Global surface temperature changes in °C relative to 1850–1900. These changes were obtained by combining CMIP6 model simulations with observational constraints based on past simulated warming, as well as an updated assessment of equilibrium climate sensitivity. *Very likely* ranges are shown for the low and high GHG emissions scenarios (SSP1-2.6 and SSP3-7.0) (Cross-Section Box.2). **Right** – Global Reasons for Concern (RFC), comparing AR6 (thick embers) and AR5 (thin embers) assessments. Risk transitions have generally shifted towards lower temperatures with updated scientific understanding. Diagrams are shown for each RFC, assuming low to no adaptation. Lines connect the midpoints of the transitions from moderate to high risk across AR5 and AR6. **Panel (b)**: Selected global risks for land and ocean ecosystems, illustrating general increase of risk with global warming levels with low to no adaptation. **Panel (c): Left** - Global mean sea level change in centimetres, relative to 1900. The historical changes (black) are observed by tide gauges before 1992 and altimeters afterwards. The future changes to 2100 (coloured lines and shading) are assessed consistently with observational constraints based on emulation of CMIP, ice-sheet, and glacier models, and *likely* ranges are shown for SSP1-2.6 and SSP3-7.0. **Right** - Assessment of the combined risk of coastal flooding, erosion and salinization for four illustrative coastal geographies in 2100, due to changing mean and extreme sea levels, under two response scenarios, with respect to the SROCC baseline period (1986–2005). The assessment does not account for changes in extreme sea level beyond those directly induced by mean sea level rise; risk levels could increase if other changes in extreme sea levels were considered (e.g., due to changes in cyclone intensity). "No-to-moderate response" describes efforts as of today (i.e., no further significant action or new types of actions). "Maximum potential response" represent a combination of responses implemented to their full extent and thus significant additional efforts compared to today, assuming minimal financial, social and political barriers. (In this context, 'today' refers to 2019.) The assessment criteria include exposure and vulnerability, coastal hazards, in-situ responses and planned relocation. Planned relocation refers to managed retreat or resettlements. The term response is used here instead of adaptation because some responses, such as retreat, may or may not be considered to be adaptation. **Panel (d)**: Selected risks under different socio-economic pathways, illustrating how development strategies and challenges to adaptation influence risk. **Left** - Heat-sensitive human health outcomes under three scenarios of adaptation effectiveness. The diagrams are truncated at the nearest whole °C within the range of temperature change in 2100 under three SSP scenarios. **Right** - Risks associated with food security due to climate change and patterns of socio-economic development. Risks to food security include availability and access to food, including population at risk of hunger, food price increases and increases in disability adjusted life years attributable to childhood underweight. Risks are assessed for two contrasted socio-economic pathways (SSP1 and SSP3) excluding the effects of targeted mitigation and adaptation policies. {*Figure 3.3*} (*Box SPM.1*)

Likelihood and Risks of Unavoidable, Irreversible or Abrupt Changes

B.3 Some future changes are unavoidable and/or irreversible but can be limited by deep, rapid, and sustained global greenhouse gas emissions reduction. The likelihood of abrupt and/or irreversible changes increases with higher global warming levels. Similarly, the probability of low-likelihood outcomes associated with potentially very large adverse impacts increases with higher global warming levels. (*high confidence*) {*3.1*}

B.3.1 Limiting global surface temperature does not prevent continued changes in climate system components that have multi-decadal or longer timescales of response (*high confidence*). Sea level rise is unavoidable for centuries to millennia due to continuing deep ocean warming and ice sheet melt, and sea levels will remain elevated for thousands of years (*high confidence*). However, deep, rapid, and sustained GHG emissions reductions would limit further sea level rise acceleration and projected long-term sea level rise commitment. Relative to 1995–2014, the *likely* global mean sea level rise under the SSP1-1.9 GHG emissions scenario is 0.15–0.23 m by 2050 and 0.28–0.55 m by 2100; while for the SSP5-8.5 GHG emissions scenario it is 0.20–0.29 m by 2050 and 0.63–1.01 m by 2100 (*medium confidence*). Over the next 2000 years, global mean sea level will rise by about 2–3 m if warming is limited to 1.5°C and 2–6 m if limited to 2°C (*low confidence*). {*3.1.3, Figure 3.4*} (*Box SPM.1*)

B.3.2 The likelihood and impacts of abrupt and/or irreversible changes in the climate system, including changes triggered when tipping points are reached, increase with further global warming (*high confidence*). As warming levels increase, so do the risks of species extinction or irreversible loss of biodiversity in ecosystems including forests (*medium confidence*), coral reefs (*very high confidence*) and in Arctic regions (*high confidence*). At sustained warming levels between 2°C and 3°C, the Greenland and West Antarctic ice sheets will be lost almost completely and irreversibly over multiple millennia, causing several metres of sea level rise *(limited evidence)*. The probability and rate of ice mass loss increase with higher global surface temperatures (*high confidence*). {*3.1.2, 3.1.3*}

B.3.3 The probability of low-likelihood outcomes associated with potentially very large impacts increases with higher global warming levels (*high confidence*). Due to deep uncertainty linked to ice-sheet processes, global mean sea level rise above the *likely* range – approaching 2 m by 2100 and in excess of 15 m by 2300 under the very high GHG emissions scenario (SSP5-8.5) (*low confidence*) – cannot be excluded. There is *medium confidence* that the Atlantic Meridional Overturning Circulation will not collapse abruptly before 2100, but if it were to occur, it would *very likely* cause abrupt shifts in regional weather patterns, and large impacts on ecosystems and human activities. {*3.1.3*} (*Box SPM.1*)

Adaptation Options and their Limits in a Warmer World

B.4 Adaptation options that are feasible and effective today will become constrained and less effective with increasing global warming. With increasing global warming, losses and damages will increase and additional human and natural systems will reach adaptation limits. Maladaptation can be avoided by flexible, multi-sectoral, inclusive, long-term planning and implementation of adaptation actions, with co-benefits to many sectors and systems. (*high confidence*) {*3.2, 4.1, 4.2, 4.3*}

B.4.1 The effectiveness of adaptation, including ecosystem-based and most water-related options, will decrease with increasing warming. The feasibility and effectiveness of options increase with integrated, multi-sectoral solutions that differentiate responses based on climate risk, cut across systems and address social inequities. As adaptation options often have long implementation times, long-term planning increases their efficiency. (*high confidence*) {*3.2, Figure 3.4, 4.1, 4.2*}

B.4.2 With additional global warming, limits to adaptation and losses and damages, strongly concentrated among vulnerable populations, will become increasingly difficult to avoid (*high confidence*). Above 1.5°C of global warming, limited freshwater resources pose potential hard adaptation limits for small islands and for regions dependent on glacier and snow melt (*medium confidence*). Above that level, ecosystems such as some warm-water coral reefs, coastal wetlands, rainforests, and polar and mountain ecosystems will have reached or surpassed hard adaptation limits and as a consequence, some Ecosystem-based Adaptation measures will also lose their effectiveness (*high confidence*). {*2.3.2, 3.2, 4.3*}

B.4.3 Actions that focus on sectors and risks in isolation and on short-term gains often lead to maladaptation over the long term, creating lock-ins of vulnerability, exposure and risks that are difficult to change. For example, seawalls effectively reduce impacts to people and assets in the short term but can also result in lock-ins and increase exposure to climate risks in the long term unless they are integrated into a long-term adaptive plan. Maladaptive responses can worsen existing inequities especially for Indigenous Peoples and marginalised groups and decrease ecosystem and biodiversity resilience. Maladaptation can be avoided by flexible, multi-sectoral, inclusive, long-term planning and implementation of adaptation actions, with co-benefits to many sectors and systems. (*high confidence*) {*2.3.2, 3.2*}

Carbon Budgets and Net Zero Emissions

B.5 Limiting human-caused global warming requires net zero CO_2 emissions. Cumulative carbon emissions until the time of reaching net zero CO_2 emissions and the level of greenhouse gas emission reductions this decade largely determine whether warming can be limited to 1.5°C or 2°C (*high confidence*). Projected CO_2 emissions from existing fossil fuel infrastructure without additional abatement would exceed the remaining carbon budget for 1.5°C (50%) (*high confidence*). {*2.3, 3.1, 3.3, Table 3.1*}

B.5.1 From a physical science perspective, limiting human-caused global warming to a specific level requires limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions, along with strong reductions in other greenhouse gas emissions. Reaching net zero GHG emissions primarily requires deep reductions in CO_2, methane, and other GHG emissions, and implies net negative CO_2 emissions[39]. Carbon dioxide removal (CDR) will be necessary to achieve net negative CO_2 emissions (see B.6). Net zero GHG emissions, if sustained, are projected to result in a gradual decline in global surface temperatures after an earlier peak. (*high confidence*) {*3.1.1, 3.3.1, 3.3.2, 3.3.3, Table 3.1, Cross-Section Box.1}*

B.5.2 For every 1000 $GtCO_2$ emitted by human activity, global surface temperature rises by 0.45°C (best estimate, with a *likely* range from 0.27°C to 0.63°C). The best estimates of the remaining carbon budgets from the beginning of 2020 are 500 $GtCO_2$ for a 50% likelihood of limiting global warming to 1.5°C and 1150 $GtCO_2$ for a 67% likelihood of limiting warming to 2°C[40]. The stronger the reductions in non-CO_2 emissions, the lower the resulting temperatures are for a given remaining carbon budget or the larger remaining carbon budget for the same level of temperature change[41]. {*3.3.1*}

[39] Net zero GHG emissions defined by the 100-year global warming potential. See footnote 9.

[40] Global databases make different choices about which emissions and removals occurring on land are considered anthropogenic. Most countries report their anthropogenic land CO_2 fluxes including fluxes due to human-caused environmental change (e.g., CO_2 fertilisation) on 'managed' land in their national GHG inventories. Using emissions estimates based on these inventories, the remaining carbon budgets must be correspondingly reduced. {*3.3.1*}

[41] For example, remaining carbon budgets could be 300 or 600 $GtCO_2$ for 1.5°C (50%), respectively for high and low non-CO_2 emissions, compared to 500 $GtCO_2$ in the central case. {*3.3.1*}

B.5.3 If the annual CO_2 emissions between 2020–2030 stayed, on average, at the same level as 2019, the resulting cumulative emissions would almost exhaust the remaining carbon budget for 1.5°C (50%), and deplete more than a third of the remaining carbon budget for 2°C (67%). Estimates of future CO_2 emissions from existing fossil fuel infrastructures without additional abatement[42] already exceed the remaining carbon budget for limiting warming to 1.5°C (50%) (*high confidence*). Projected cumulative future CO_2 emissions over the lifetime of existing and planned fossil fuel infrastructure, if historical operating patterns are maintained and without additional abatement[43], are approximately equal to the remaining carbon budget for limiting warming to 2°C with a likelihood of 83%[44] (*high confidence*). {*2.3.1*, *3.3.1*, *Figure 3.5*}

B.5.4 Based on central estimates only, historical cumulative net CO_2 emissions between 1850 and 2019 amount to about four fifths[45] of the total carbon budget for a 50% probability of limiting global warming to 1.5°C (central estimate about 2900 $GtCO_2$), and to about two thirds[46] of the total carbon budget for a 67% probability to limit global warming to 2°C (central estimate about 3550 $GtCO_2$). {*3.3.1*, *Figure 3.5*}

Mitigation Pathways

B.6 All global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot, and those that limit warming to 2°C (>67%), involve rapid and deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors this decade. Global net zero CO_2 emissions are reached for these pathway categories, in the early 2050s and around the early 2070s, respectively. (*high confidence*) {*3.3, 3.4, 4.1, 4.5, Table 3.1*} (*Figure SPM.5, Box SPM.1*)

B.6.1 Global modelled pathways provide information on limiting warming to different levels; these pathways, particularly their sectoral and regional aspects, depend on the assumptions described in Box SPM.1. Global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot or limit warming to 2°C (>67%) are characterized by deep, rapid, and, in most cases, immediate GHG emissions reductions. Pathways that limit warming to 1.5 °C (>50%) with no or limited overshoot reach net zero CO_2 in the early 2050s, followed by net negative CO_2 emissions. Those pathways that reach net zero GHG emissions do so around the 2070s. Pathways that limit warming to 2 °C (>67%) reach net zero CO_2 emissions in the early 2070s. Global GHG emissions are projected to peak between 2020 and at the latest before 2025 in global modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot and in those that limit warming to 2°C (>67%) and assume immediate action. (*high confidence*) {*3.3.2*, *3.3.4*, *4.1*, *Table 3.1*, *Figure 3.6*} (*Table SPM.1*)

[42] Abatement here refers to human interventions that reduce the amount of greenhouse gases that are released from fossil fuel infrastructure to the atmosphere.

[43] Ibid.

[44] WGI provides carbon budgets that are in line with limiting global warming to temperature limits with different likelihoods, such as 50%, 67% or 83%. {*3.3.1*}

[45] Uncertainties for total carbon budgets have not been assessed and could affect the specific calculated fractions.

[46] Ibid.

Table SPM.1: Greenhouse gas and CO_2 emission reductions from 2019, median and 5-95 percentiles. {*3.3.1, 4.1, Table 3.1, Figure 2.5, Box SPM.1*}

		Reductions from 2019 emission levels (%)			
		2030	2035	2040	2050
Limit warming to1.5°C (>50%) with no or limited overshoot	GHG	43 [34-60]	60 [49-77]	69 [58-90]	84 [73-98]
	CO_2	48 [36-69]	65 [50-96]	80 [61-109]	99 [79-119]
Limit warming to 2°C (>67%)	GHG	21 [1-42]	35 [22-55]	46 [34-63]	64 [53-77]
	CO_2	22 [1-44]	37 [21-59]	51 [36-70]	73 [55-90]

B.6.2 Reaching net zero CO_2 or GHG emissions primarily requires deep and rapid reductions in gross emissions of CO_2, as well as substantial reductions of non-CO_2 GHG emissions (*high confidence*). For example, in modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot, global methane emissions are reduced by 34 [21–57] % by 2030 relative to 2019. However, some hard-to-abate residual GHG emissions (e.g., some emissions from agriculture, aviation, shipping, and industrial processes) remain and would need to be counterbalanced by deployment of CDR methods to achieve net zero CO_2 or GHG emissions (*high confidence*). As a result, net zero CO_2 is reached earlier than net zero GHGs (*high confidence*). {*3.3.2, 3.3.3, Table 3.1, Figure 3.5*} (*Figure SPM.5*)

B.6.3 Global modelled mitigation pathways reaching net zero CO_2 and GHG emissions include transitioning from fossil fuels without carbon capture and storage (CCS) to very low- or zero-carbon energy sources, such as renewables or fossil fuels with CCS, demand-side measures and improving efficiency, reducing non-CO_2 GHG emissions, and CDR[47]. In most global modelled pathways, land-use change and forestry (via reforestation and reduced deforestation) and the energy supply sector reach net zero CO_2 emissions earlier than the buildings, industry and transport sectors. (*high confidence*) {*3.3.3, 4.1, 4.5, Figure 4.1*} (*Figure SPM.5, Box SPM.1*)

B.6.4 Mitigation options often have synergies with other aspects of sustainable development, but some options can also have trade-offs. There are potential synergies between sustainable development and, for instance, energy efficiency and renewable energy. Similarly, depending on the context[48], biological CDR methods like reforestation, improved forest management, soil carbon sequestration, peatland restoration and coastal blue carbon management can enhance biodiversity and ecosystem functions, employment and local livelihoods. However, afforestation or production of biomass crops can have adverse socio-economic and environmental impacts, including on biodiversity, food and water security, local livelihoods and the rights of Indigenous Peoples, especially if implemented at large scales and where land tenure is insecure. Modelled pathways that assume using resources more efficiently or that shift global development towards sustainability include fewer challenges, such as less dependence on CDR and pressure on land and biodiversity. (*high confidence*) {*3.4.1*}

[47] CCS is an option to reduce emissions from large-scale fossil-based energy and industry sources provided geological storage is available. When CO_2 is captured directly from the atmosphere (DACCS), or from biomass (BECCS), CCS provides the storage component of these CDR methods. CO_2 capture and subsurface injection is a mature technology for gas processing and enhanced oil recovery. In contrast to the oil and gas sector, CCS is less mature in the power sector, as well as in cement and chemicals production, where it is a critical mitigation option. The technical geological storage capacity is estimated to be on the order of 1000 $GtCO_2$, which is more than the CO_2 storage requirements through 2100 to limit global warming to 1.5°C, although the regional availability of geological storage could be a limiting factor. If the geological storage site is appropriately selected and managed, it is estimated that the CO_2 can be permanently isolated from the atmosphere. Implementation of CCS currently faces technological, economic, institutional, ecological-environmental and socio-cultural barriers. Currently, global rates of CCS deployment are far below those in modelled pathways limiting global warming to 1.5°C to 2°C. Enabling conditions such as policy instruments, greater public support and technological innovation could reduce these barriers. (*high confidence*) {*3.3.3*}

[48] The impacts, risks, and co-benefits of CDR deployment for ecosystems, biodiversity and people will be highly variable depending on the method, site-specific context, implementation and scale (*high confidence*).

Limiting warming to 1.5°C and 2°C involves rapid, deep and in most cases immediate greenhouse gas emission reductions

Net zero CO_2 and net zero GHG emissions can be achieved through strong reductions across all sectors

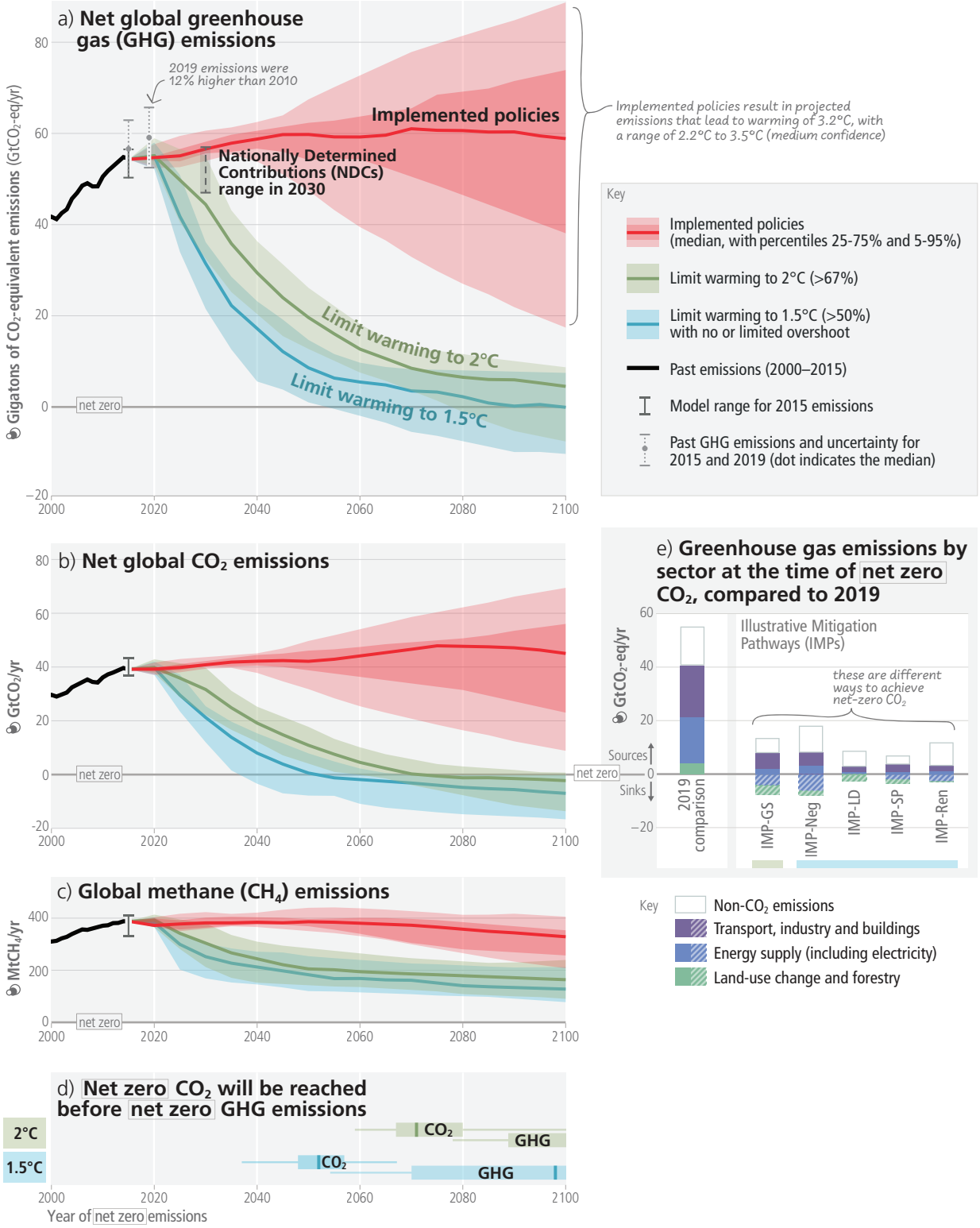


Figure SPM.5: Global emissions pathways consistent with implemented policies and mitigation strategies. Panels (a), (b) and **(c)** show the development of global GHG, CO_2 and methane emissions in modelled pathways, while **panel (d)** shows the associated timing of when GHG and CO_2 emissions reach net zero. Coloured ranges denote the 5th to 95th percentile across the global modelled pathways falling within a given category as described in Box SPM.1. The red ranges depict emissions pathways assuming policies that were implemented by the end of 2020. Ranges of modelled pathways that limit warming to 1.5°C (>50%) with no or limited overshoot are shown in light blue (category C1) and pathways that limit warming to 2°C (>67%) are shown in green (category C3). Global emission pathways that would limit warming to 1.5°C (>50%) with no or limited overshoot and also reach net zero GHG in the second half of the century do so between 2070–2075. **Panel (e)** shows the sectoral contributions of CO_2 and non-CO_2 emissions sources and sinks at the time when net zero CO_2 emissions are reached in illustrative mitigation pathways (IMPs) consistent with limiting warming to 1.5°C with a high reliance on net negative emissions (IMP-Neg) ("high overshoot"), high resource efficiency (IMP-LD), a focus on sustainable development (IMP-SP), renewables (IMP-Ren) and limiting warming to 2°C with less rapid mitigation initially followed by a gradual strengthening (IMP-GS). Positive and negative emissions for different IMPs are compared to GHG emissions from the year 2019. Energy supply (including electricity) includes bioenergy with carbon dioxide capture and storage and direct air carbon dioxide capture and storage. CO_2 emissions from land-use change and forestry can only be shown as a net number as many models do not report emissions and sinks of this category separately. {*Figure 3.6, 4.1*} (*Box SPM.1*)

Overshoot: Exceeding a Warming Level and Returning

B.7 If warming exceeds a specified level such as 1.5°C, it could gradually be reduced again by achieving and sustaining net negative global CO_2 emissions. This would require additional deployment of carbon dioxide removal, compared to pathways without overshoot, leading to greater feasibility and sustainability concerns. Overshoot entails adverse impacts, some irreversible, and additional risks for human and natural systems, all growing with the magnitude and duration of overshoot. (*high confidence*) {*3.1, 3.3, 3.4, Table 3.1, Figure 3.6*}

B.7.1 Only a small number of the most ambitious global modelled pathways limit global warming to 1.5°C (>50%) by 2100 without exceeding this level temporarily. Achieving and sustaining net negative global CO_2 emissions, with annual rates of CDR greater than residual CO_2 emissions, would gradually reduce the warming level again (*high confidence*). Adverse impacts that occur during this period of overshoot and cause additional warming via feedback mechanisms, such as increased wildfires, mass mortality of trees, drying of peatlands, and permafrost thawing, weakening natural land carbon sinks and increasing releases of GHGs would make the return more challenging (*medium confidence*). {*3.3.2, 3.3.4, Table 3.1, Figure 3.6*} (*Box SPM.1*)

B.7.2 The higher the magnitude and the longer the duration of overshoot, the more ecosystems and societies are exposed to greater and more widespread changes in climatic impact-drivers, increasing risks for many natural and human systems. Compared to pathways without overshoot, societies would face higher risks to infrastructure, low-lying coastal settlements, and associated livelihoods. Overshooting 1.5°C will result in irreversible adverse impacts on certain ecosystems with low resilience, such as polar, mountain, and coastal ecosystems, impacted by ice-sheet melt, glacier melt, or by accelerating and higher committed sea level rise. (*high confidence*) {*3.1.2, 3.3.4*}

B.7.3 The larger the overshoot, the more net negative CO_2 emissions would be needed to return to 1.5°C by 2100. Transitioning towards net zero CO_2 emissions faster and reducing non-CO_2 emissions such as methane more rapidly would limit peak warming levels and reduce the requirement for net negative CO_2 emissions, thereby reducing feasibility and sustainability concerns, and social and environmental risks associated with CDR deployment at large scales. (*high confidence*) {*3.3.3, 3.3.4, 3.4.1, Table 3.1*}

C. Responses in the Near Term

Urgency of Near-Term Integrated Climate Action

C.1 Climate change is a threat to human well-being and planetary health (*very high confidence*). There is a rapidly closing window of opportunity to secure a liveable and sustainable future for all (*very high confidence*). Climate resilient development integrates adaptation and mitigation to advance sustainable development for all, and is enabled by increased international cooperation including improved access to adequate financial resources, particularly for vulnerable regions, sectors and groups, and inclusive governance and coordinated policies (*high confidence*). The choices and actions implemented in this decade will have impacts now and for thousands of years (*high confidence*). {*3.1, 3.3, 4.1, 4.2, 4.3, 4.4, 4.7, 4.8, 4.9, Figure 3.1, Figure 3.3, Figure 4.2*} (*Figure SPM.1, Figure SPM.6*)

C.1.1 Evidence of observed adverse impacts and related losses and damages, projected risks, levels and trends in vulnerability and adaptation limits, demonstrate that worldwide climate resilient development action is more urgent than previously assessed in AR5. Climate resilient development integrates adaptation and GHG mitigation to advance sustainable development for all. Climate resilient development pathways have been constrained by past development, emissions and climate change and are progressively constrained by every increment of warming, in particular beyond 1.5°C. (*very high confidence*) {*3.4, 3.4.2, 4.1*}

C.1.2 Government actions at sub-national, national and international levels, with civil society and the private sector, play a crucial role in enabling and accelerating shifts in development pathways towards sustainability and climate resilient development (*very high confidence*). Climate resilient development is enabled when governments, civil society and the private sector make inclusive development choices that prioritize risk reduction, equity and justice, and when decision-making processes, finance and actions are integrated across governance levels, sectors, and timeframes (*very high confidence*). Enabling conditions are differentiated by national, regional and local circumstances and geographies, according to capabilities, and include: political commitment and follow-through, coordinated policies, social and international cooperation, ecosystem stewardship, inclusive governance, knowledge diversity, technological innovation, monitoring and evaluation, and improved access to adequate financial resources, especially for vulnerable regions, sectors and communities (*high confidence*). {*3.4, 4.2, 4.4, 4.5, 4.7, 4.8*} (*Figure SPM.6*)

C.1.3 Continued emissions will further affect all major climate system components, and many changes will be irreversible on centennial to millennial time scales and become larger with increasing global warming. Without urgent, effective, and equitable mitigation and adaptation actions, climate change increasingly threatens ecosystems, biodiversity, and the livelihoods, health and well-being of current and future generations. (*high confidence*) {*3.1.3, 3.3.3, 3.4.1, Figure 3.4, 4.1, 4.2, 4.3, 4.4*} (*Figure SPM.1, Figure SPM.6*)

There is a rapidly narrowing window of opportunity to enable climate resilient development

Multiple interacting choices and actions can shift development pathways towards sustainability

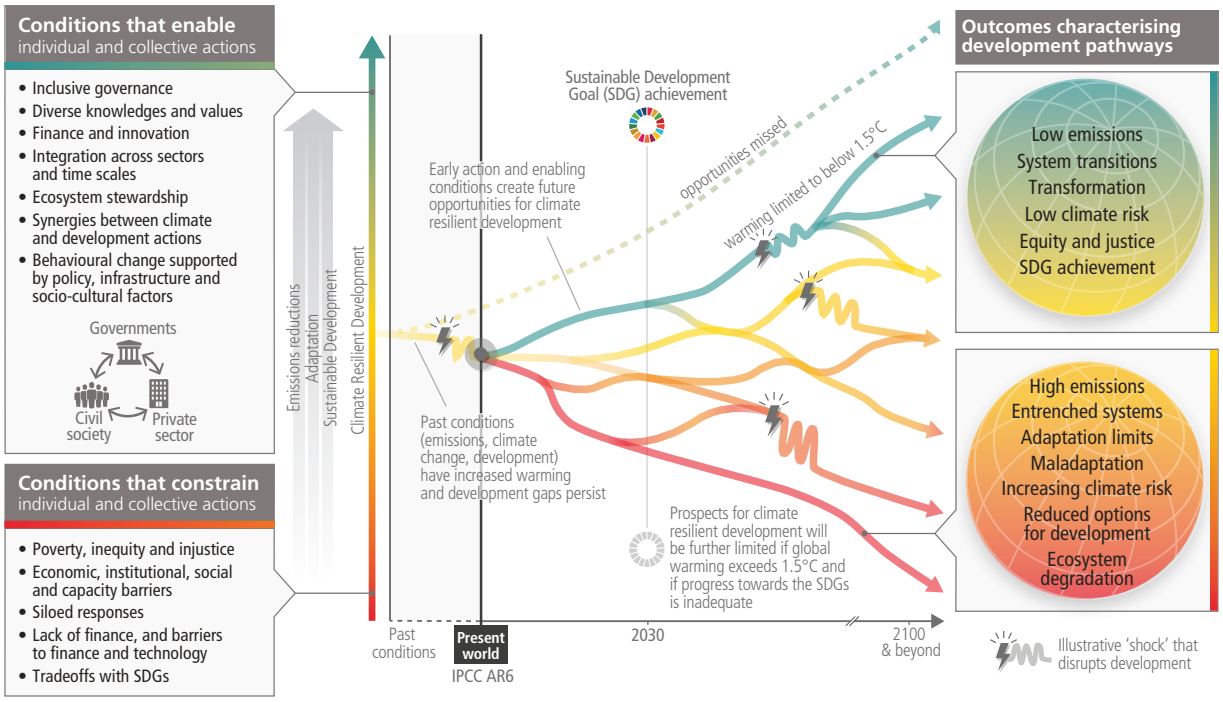


Figure SPM.6: The illustrative development pathways (red to green) and associated outcomes (right panel) show that there is a rapidly narrowing window of opportunity to secure a liveable and sustainable future for all. Climate resilient development is the process of implementing greenhouse gas mitigation and adaptation measures to support sustainable development. Diverging pathways illustrate that interacting choices and actions made by diverse government, private sector and civil society actors can advance climate resilient development, shift pathways towards sustainability, and enable lower emissions and adaptation. Diverse knowledge and values include cultural values, Indigenous Knowledge, local knowledge, and scientific knowledge. Climatic and non-climatic events, such as droughts, floods or pandemics, pose more severe shocks to pathways with lower climate resilient development (red to yellow) than to pathways with higher climate resilient development (green). There are limits to adaptation and adaptive capacity for some human and natural systems at global warming of 1.5°C, and with every increment of warming, losses and damages will increase. The development pathways taken by countries at all stages of economic development impact GHG emissions and mitigation challenges and opportunities, which vary across countries and regions. Pathways and opportunities for action are shaped by previous actions (or inactions and opportunities missed; dashed pathway) and enabling and constraining conditions (left panel), and take place in the context of climate risks, adaptation limits and development gaps. The longer emissions reductions are delayed, the fewer effective adaptation options. {*Figure 4.2, 3.1, 3.2, 3.4, 4.2, 4.4, 4.5, 4.6, 4.9*}

The Benefits of Near-Term Action

C.2 Deep, rapid, and sustained mitigation and accelerated implementation of adaptation actions in this decade would reduce projected losses and damages for humans and ecosystems (*very high confidence*), and deliver many co-benefits, especially for air quality and health (*high confidence*). Delayed mitigation and adaptation action would lock in high-emissions infrastructure, raise risks of stranded assets and cost-escalation, reduce feasibility, and increase losses and damages (*high confidence*). Near-term actions involve high up-front investments and potentially disruptive changes that can be lessened by a range of enabling policies (*high confidence*). {*2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8*}

C.2.1 Deep, rapid, and sustained mitigation and accelerated implementation of adaptation actions in this decade would reduce future losses and damages related to climate change for humans and ecosystems (*very high confidence*). As adaptation options often have long implementation times, accelerated implementation of adaptation in this decade is important to close adaptation gaps (*high confidence*). Comprehensive, effective, and innovative responses integrating adaptation and mitigation can harness synergies and reduce trade-offs between adaptation and mitigation (*high confidence*). {*4.1, 4.2, 4.3*}

C.2.2 Delayed mitigation action will further increase global warming and losses and damages will rise and additional human and natural systems will reach adaptation limits. Challenges from delayed adaptation and mitigation actions include the risk of cost escalation, lock-in of infrastructure, stranded assets, and reduced feasibility and effectiveness of adaptation and mitigation options. Without rapid, deep and sustained mitigation and accelerated adaptation actions, losses and damages will continue to increase, including projected adverse impacts in Africa, LDCs, SIDS, Central and South America[49], Asia and the Arctic, and will disproportionately affect the most vulnerable populations. *(high confidence*) {*2.1.2, 3.1.2, 3.2, 3.3.1, 3.3.3, 4.1, 4.2, 4.3*} (*Figure SPM.3, Figure SPM.4*)

C.2.3 Accelerated climate action can also provide co-benefits (see also C.4) (*high confidence*). Many mitigation actions would have benefits for health through lower air pollution, active mobility (e.g., walking, cycling), and shifts to sustainable healthy diets (*high confidence*). Strong, rapid and sustained reductions in methane emissions can limit near-term warming and improve air quality by reducing global surface ozone (*high confidence*). Adaptation can generate multiple additional benefits such as improving agricultural productivity, innovation, health and well-being, food security, livelihood, and biodiversity conservation (*very high confidence*). {*4.2, 4.5.4, 4.5.5, 4.6*}

C.2.4 Cost-benefit analysis remains limited in its ability to represent all avoided damages from climate change (*high confidence*). The economic benefits for human health from air quality improvement arising from mitigation action can be of the same order of magnitude as mitigation costs, and potentially even larger (*medium confidence*). Even without accounting for all the benefits of avoiding potential damages, the global economic and social benefit of limiting global warming to 2°C exceeds the cost of mitigation in most of the assessed literature (*medium confidence*)[50]. More rapid climate change mitigation, with emissions peaking earlier, increases co-benefits and reduces feasibility risks and costs in the long-term, but requires higher up-front investments (*high confidence*). {*3.4.1, 4.2*}

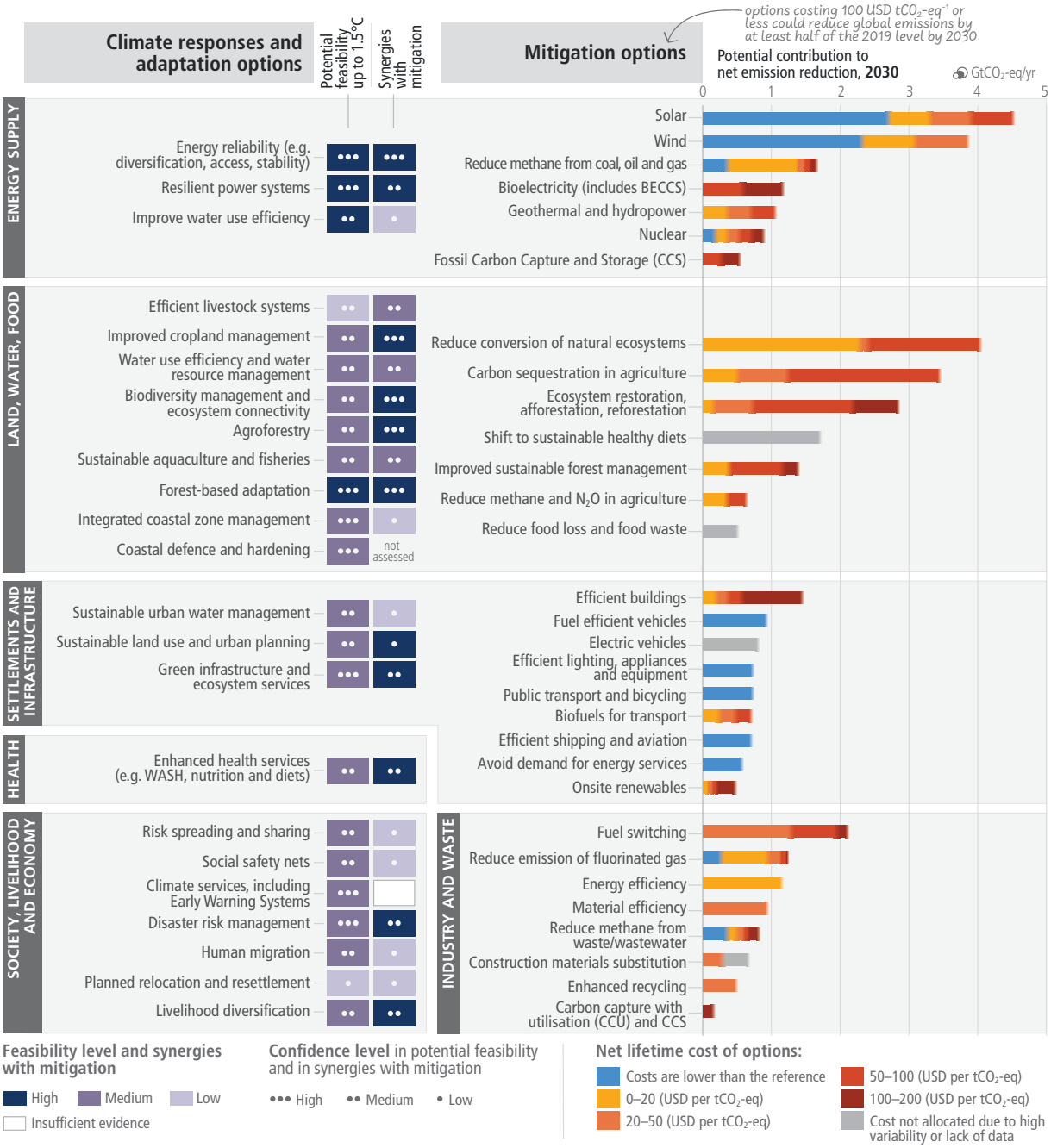
C.2.5 Ambitious mitigation pathways imply large and sometimes disruptive changes in existing economic structures, with significant distributional consequences within and between countries. To accelerate climate action, the adverse consequences of these changes can be moderated by fiscal, financial, institutional and regulatory reforms and by integrating climate actions with macroeconomic policies through (i) economy-wide packages, consistent with national circumstances, supporting sustainable low-emission growth paths; (ii) climate resilient safety nets and social protection; and (iii) improved access to finance for low-emissions infrastructure and technologies, especially in developing countries. (*high confidence*) {*4.2, 4.4, 4.7, 4.8.1*}

[49] The southern part of Mexico is included in the climatic subregion South Central America (SCA) for WGI. Mexico is assessed as part of North America for WGII. The climate change literature for the SCA region occasionally includes Mexico, and in those cases WGII assessment makes reference to Latin America. Mexico is considered part of Latin America and the Caribbean for WGIII.

[50] The evidence is too limited to make a similar robust conclusion for limiting warming to 1.5°C. Limiting global warming to 1.5°C instead of 2°C would increase the costs of mitigation, but also increase the benefits in terms of reduced impacts and related risks, and reduced adaptation needs (*high confidence*).

There are multiple opportunities for scaling up climate action

a) Feasibility of climate responses and adaptation, and potential of mitigation options in the near term



b) Potential of demand-side mitigation options by 2050

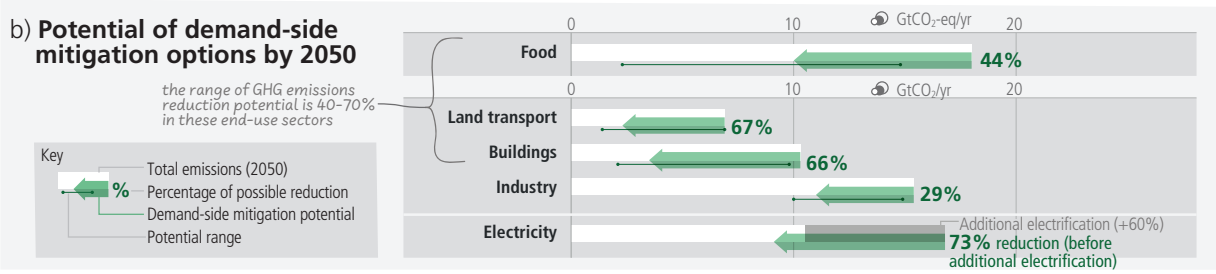


Figure SPM.7: Multiple Opportunities for scaling up climate action. Panel (a) presents selected mitigation and adaptation options across different systems. The left-hand side of panel a shows climate responses and adaptation options assessed for their multidimensional feasibility at global scale, in the near term and up to 1.5°C global warming. As literature above 1.5°C is limited, feasibility at higher levels of warming may change, which is currently not possible to assess robustly. The term response is used here in addition to adaptation because some responses, such as migration, relocation and resettlement may or may not be considered to be adaptation. Forest based adaptation includes sustainable forest management, forest conservation and restoration, reforestation

and afforestation. WASH refers to water, sanitation and hygiene. Six feasibility dimensions (economic, technological, institutional, social, environmental and geophysical) were used to calculate the potential feasibility of climate responses and adaptation options, along with their synergies with mitigation. For potential feasibility and feasibility dimensions, the figure shows high, medium, or low feasibility. Synergies with mitigation are identified as high, medium, and low. The right-hand side of Panel a provides an overview of selected mitigation options and their estimated costs and potentials in 2030. Costs are net lifetime discounted monetary costs of avoided GHG emissions calculated relative to a reference technology. Relative potentials and costs will vary by place, context and time and in the longer term compared to 2030. The potential (horizontal axis) is the net GHG emission reduction (sum of reduced emissions and/or enhanced sinks) broken down into cost categories (coloured bar segments) relative to an emission baseline consisting of current policy (around 2019) reference scenarios from the AR6 scenarios database. The potentials are assessed independently for each option and are not additive. Health system mitigation options are included mostly in settlement and infrastructure (e.g., efficient healthcare buildings) and cannot be identified separately. Fuel switching in industry refers to switching to electricity, hydrogen, bioenergy and natural gas. Gradual colour transitions indicate uncertain breakdown into cost categories due to uncertainty or heavy context dependency. The uncertainty in the total potential is typically 25–50%. **Panel (b)** displays the indicative potential of demand-side mitigation options for 2050. Potentials are estimated based on approximately 500 bottom-up studies representing all global regions. The baseline (white bar) is provided by the sectoral mean GHG emissions in 2050 of the two scenarios (IEA-STEPS and IP_ModAct) consistent with policies announced by national governments until 2020. The green arrow represents the demand-side emissions reductions potentials. The range in potential is shown by a line connecting dots displaying the highest and the lowest potentials reported in the literature. Food shows demand-side potential of socio-cultural factors and infrastructure use, and changes in land-use patterns enabled by change in food demand. Demand-side measures and new ways of end-use service provision can reduce global GHG emissions in end-use sectors (buildings, land transport, food) by 40–70% by 2050 compared to baseline scenarios, while some regions and socioeconomic groups require additional energy and resources. The last row shows how demand-side mitigation options in other sectors can influence overall electricity demand. The dark grey bar shows the projected increase in electricity demand above the 2050 baseline due to increasing electrification in the other sectors. Based on a bottom-up assessment, this projected increase in electricity demand can be avoided through demand-side mitigation options in the domains of infrastructure use and socio-cultural factors that influence electricity usage in industry, land transport, and buildings (green arrow). {*Figure 4.4*}

Mitigation and Adaptation Options across Systems

C.3 Rapid and far-reaching transitions across all sectors and systems are necessary to achieve deep and sustained emissions reductions and secure a liveable and sustainable future for all. These system transitions involve a significant upscaling of a wide portfolio of mitigation and adaptation options. Feasible, effective, and low-cost options for mitigation and adaptation are already available, with differences across systems and regions. (*high confidence*) {*4.1, 4.5, 4.6*} (*Figure SPM.7*)

C.3.1 The systemic change required to achieve rapid and deep emissions reductions and transformative adaptation to climate change is unprecedented in terms of scale, but not necessarily in terms of speed (*medium confidence*). Systems transitions include: deployment of low- or zero-emission technologies; reducing and changing demand through infrastructure design and access, socio-cultural and behavioural changes, and increased technological efficiency and adoption; social protection, climate services or other services; and protecting and restoring ecosystems (*high confidence*). Feasible, effective, and low-cost options for mitigation and adaptation are already available (*high confidence*). The availability, feasibility and potential of mitigation and adaptation options in the near term differs across systems and regions (*very high confidence*). {*4.1, 4.5.1 to 4.5.6*} (*Figure SPM.7*)

Energy Systems

C.3.2 Net zero CO_2 energy systems entail: a substantial reduction in overall fossil fuel use, minimal use of unabated fossil fuels[51], and use of carbon capture and storage in the remaining fossil fuel systems; electricity systems that emit no net CO_2; widespread electrification; alternative energy carriers in applications less amenable to electrification; energy conservation and efficiency; and greater integration across the energy system (*high confidence*). Large contributions to emissions reductions with costs less than USD 20 tCO_2-eq^{-1} come from solar and wind energy, energy efficiency improvements, and methane emissions reductions (coal mining, oil and gas, waste) (*medium confidence*). There are feasible adaptation options that support infrastructure resilience, reliable power systems and efficient water use for existing and new energy generation systems (*very high confidence*). Energy generation diversification (e.g., via wind, solar, small scale hydropower) and demand-side management (e.g., storage and energy efficiency improvements) can increase energy reliability and reduce vulnerabilities to climate change (*high confidence*). Climate responsive energy markets, updated design standards on energy assets according to current and projected climate change, smart-grid technologies, robust transmission systems and improved capacity to respond to supply deficits have high feasibility in the medium to long term, with mitigation co-benefits (*very high confidence*). {*4.5.1*} (*Figure SPM.7*)

[51] In this context, 'unabated fossil fuels' refers to fossil fuels produced and used without interventions that substantially reduce the amount of GHG emitted throughout the life cycle; for example, capturing 90% or more CO_2 from power plants, or 50–80% of fugitive methane emissions from energy supply.

Industry and Transport

C.3.3 Reducing industry GHG emissions entails coordinated action throughout value chains to promote all mitigation options, including demand management, energy and materials efficiency, circular material flows, as well as abatement technologies and transformational changes in production processes (*high confidence*). In transport, sustainable biofuels, low-emissions hydrogen, and derivatives (including ammonia and synthetic fuels) can support mitigation of CO_2 emissions from shipping, aviation, and heavy-duty land transport but require production process improvements and cost reductions (*medium confidence*). Sustainable biofuels can offer additional mitigation benefits in land-based transport in the short and medium term (*medium confidence*). Electric vehicles powered by low-GHG emissions electricity have large potential to reduce land-based transport GHG emissions, on a life cycle basis (*high confidence*). Advances in battery technologies could facilitate the electrification of heavy-duty trucks and compliment conventional electric rail systems (*medium confidence*). The environmental footprint of battery production and growing concerns about critical minerals can be addressed by material and supply diversification strategies, energy and material efficiency improvements, and circular material flows (*medium confidence*). {*4.5.2, 4.5.3*} (*Figure SPM.7*)

Cities, Settlements and Infrastructure

C.3.4 Urban systems are critical for achieving deep emissions reductions and advancing climate resilient development (*high confidence*). Key adaptation and mitigation elements in cities include considering climate change impacts and risks (e.g., through climate services) in the design and planning of settlements and infrastructure; land use planning to achieve compact urban form, co-location of jobs and housing; supporting public transport and active mobility (e.g., walking and cycling); the efficient design, construction, retrofit, and use of buildings; reducing and changing energy and material consumption; sufficiency[52]; material substitution; and electrification in combination with low emissions sources (*high confidence*). Urban transitions that offer benefits for mitigation, adaptation, human health and well-being, ecosystem services, and vulnerability reduction for low-income communities are fostered by inclusive long-term planning that takes an integrated approach to physical, natural and social infrastructure (*high confidence*). Green/natural and blue infrastructure supports carbon uptake and storage and either singly or when combined with grey infrastructure can reduce energy use and risk from extreme events such as heatwaves, flooding, heavy precipitation and droughts, while generating co-benefits for health, well-being and livelihoods (*medium confidence*). {*4.5.3*}

Land, Ocean, Food, and Water

C.3.5 Many agriculture, forestry, and other land use (AFOLU) options provide adaptation and mitigation benefits that could be upscaled in the near term across most regions. Conservation, improved management, and restoration of forests and other ecosystems offer the largest share of economic mitigation potential, with reduced deforestation in tropical regions having the highest total mitigation potential. Ecosystem restoration, reforestation, and afforestation can lead to trade-offs due to competing demands on land. Minimizing trade-offs requires integrated approaches to meet multiple objectives including food security. Demand-side measures (shifting to sustainable healthy diets[53] and reducing food loss/waste) and sustainable agricultural intensification can reduce ecosystem conversion, and methane and nitrous oxide emissions, and free up land for reforestation and ecosystem restoration. Sustainably sourced agricultural and forest products, including long-lived wood products, can be used instead of more GHG-intensive products in other sectors. Effective adaptation options include cultivar improvements, agroforestry, community-based adaptation, farm and landscape diversification, and urban agriculture. These AFOLU response options require integration of biophysical, socioeconomic and other enabling factors. Some options, such as conservation of high-carbon ecosystems (e.g., peatlands, wetlands, rangelands, mangroves and forests), deliver immediate benefits, while others, such as restoration of high-carbon ecosystems, take decades to deliver measurable results. (*high confidence*) {*4.5.4*} (*Figure SPM.7*)

C.3.6 Maintaining the resilience of biodiversity and ecosystem services at a global scale depends on effective and equitable conservation of approximately 30% to 50% of Earth's land, freshwater and ocean areas, including currently near-natural ecosystems (*high confidence*). Conservation, protection and restoration of terrestrial, freshwater, coastal and

[52] A set of measures and daily practices that avoid demand for energy, materials, land, and water while delivering human well-being for all within planetary boundaries. {*4.5.3*}

[53] 'Sustainable healthy diets' promote all dimensions of individuals' health and well-being; have low environmental pressure and impact; are accessible, affordable, safe and equitable; and are culturally acceptable, as described in FAO and WHO. The related concept of 'balanced diets' refers to diets that feature plant-based foods, such as those based on coarse grains, legumes, fruits and vegetables, nuts and seeds, and animal-sourced food produced in resilient, sustainable and low-GHG emission systems, as described in SRCCL.

ocean ecosystems, together with targeted management to adapt to unavoidable impacts of climate change reduces the vulnerability of biodiversity and ecosystem services to climate change (*high confidence*), reduces coastal erosion and flooding (*high confidence*), and could increase carbon uptake and storage if global warming is limited (*medium confidence*). Rebuilding overexploited or depleted fisheries reduces negative climate change impacts on fisheries (*medium confidence*) and supports food security, biodiversity, human health and well-being (*high confidence*). Land restoration contributes to climate change mitigation and adaptation with synergies via enhanced ecosystem services and with economically positive returns and co-benefits for poverty reduction and improved livelihoods (*high confidence*). Cooperation, and inclusive decision making, with Indigenous Peoples and local communities, as well as recognition of inherent rights of Indigenous Peoples, is integral to successful adaptation and mitigation across forests and other ecosystems (*high confidence*). {*4.5.4, 4.6*} (*Figure SPM.7*)

Health and Nutrition

C.3.7 Human health will benefit from integrated mitigation and adaptation options that mainstream health into food, infrastructure, social protection, and water policies (*very high confidence*). Effective adaptation options exist to help protect human health and well-being, including: strengthening public health programs related to climate-sensitive diseases, increasing health systems resilience, improving ecosystem health, improving access to potable water, reducing exposure of water and sanitation systems to flooding, improving surveillance and early warning systems, vaccine development (*very high confidence*), improving access to mental healthcare, and Heat Health Action Plans that include early warning and response systems (*high confidence*). Adaptation strategies which reduce food loss and waste or support balanced, sustainable healthy diets contribute to nutrition, health, biodiversity and other environmental benefits (*high confidence*). {*4.5.5*} (*Figure SPM.7*)

Society, Livelihoods, and Economies

C.3.8 Policy mixes that include weather and health insurance, social protection and adaptive social safety nets, contingent finance and reserve funds, and universal access to early warning systems combined with effective contingency plans, can reduce vulnerability and exposure of human systems. Disaster risk management, early warning systems, climate services and risk spreading and sharing approaches have broad applicability across sectors. Increasing education including capacity building, climate literacy, and information provided through climate services and community approaches can facilitate heightened risk perception and accelerate behavioural changes and planning. (*high confidence*) {*4.5.6*}

Synergies and Trade-Offs with Sustainable Development

C.4 Accelerated and equitable action in mitigating and adapting to climate change impacts is critical to sustainable development. Mitigation and adaptation actions have more synergies than trade-offs with Sustainable Development Goals. Synergies and trade-offs depend on context and scale of implementation. (*high confidence*) {*3.4, 4.2, 4.4, 4.5, 4.6, 4.9, Figure 4.5*}

C.4.1 Mitigation efforts embedded within the wider development context can increase the pace, depth and breadth of emission reductions (*medium confidence*). Countries at all stages of economic development seek to improve the well-being of people, and their development priorities reflect different starting points and contexts. Different contexts include but are not limited to social, economic, environmental, cultural, political circumstances, resource endowment, capabilities, international environment, and prior development (*high confidence*). In regions with high dependency on fossil fuels for, among other things, revenue and employment generation, mitigating risk for sustainable development requires policies that promote economic and energy sector diversification and considerations of just transitions principles, processes and practices (*high confidence*). Eradicating extreme poverty, energy poverty, and providing decent living standards in low-emitting countries / regions in the context of achieving sustainable development objectives, in the near term, can be achieved without significant global emissions growth (*high confidence*). {*4.4, 4.6, Annex I: Glossary*}

C.4.2 Many mitigation and adaptation actions have multiple synergies with Sustainable Development Goals (SDGs) and sustainable development generally, but some actions can also have trade-offs. Potential synergies with SDGs exceed potential trade-offs; synergies and trade-offs depend on the pace and magnitude of change and the development context including inequalities with consideration of climate justice. Trade-offs can be evaluated and minimised by giving emphasis to capacity building, finance, governance, technology transfer, investments, development, context specific gender-based and other social equity considerations with meaningful participation of Indigenous Peoples, local communities and vulnerable populations. (*high confidence*) {*3.4.1, 4.6, Figure 4.5, 4.9*}

C.4.3 Implementing both mitigation and adaptation actions together and taking trade-offs into account supports co-benefits and synergies for human health and well-being. For example, improved access to clean energy sources and technologies generates health benefits especially for women and children; electrification combined with low-GHG energy, and shifts to active mobility and public transport can enhance air quality, health, employment, and can elicit energy security and deliver equity. (*high confidence*) {*4.2, 4.5.3, 4.5.5, 4.6, 4.9*}

Equity and Inclusion

C.5 Prioritising equity, climate justice, social justice, inclusion and just transition processes can enable adaptation and ambitious mitigation actions and climate resilient development. Adaptation outcomes are enhanced by increased support to regions and people with the highest vulnerability to climatic hazards. Integrating climate adaptation into social protection programs improves resilience. Many options are available for reducing emission-intensive consumption, including through behavioural and lifestyle changes, with co-benefits for societal well-being. (*high confidence*) {*4.4, 4.5*}

C.5.1 Equity remains a central element in the UN climate regime, notwithstanding shifts in differentiation between states over time and challenges in assessing fair shares. Ambitious mitigation pathways imply large and sometimes disruptive changes in economic structure, with significant distributional consequences, within and between countries. Distributional consequences within and between countries include shifting of income and employment during the transition from high- to low-emissions activities. (*high confidence*) {*4.4*}

C.5.2 Adaptation and mitigation actions that prioritise equity, social justice, climate justice, rights-based approaches, and inclusivity, lead to more sustainable outcomes, reduce trade-offs, support transformative change and advance climate resilient development. Redistributive policies across sectors and regions that shield the poor and vulnerable, social safety nets, equity, inclusion and just transitions, at all scales can enable deeper societal ambitions and resolve trade-offs with sustainable development goals. Attention to equity and broad and meaningful participation of all relevant actors in decision making at all scales can build social trust which builds on equitable sharing of benefits and burdens of mitigation that deepen and widen support for transformative changes. (*high confidence*) {*4.4*}

C.5.3 Regions and people (3.3 to 3.6 billion in number) with considerable development constraints have high vulnerability to climatic hazards (see A.2.2). Adaptation outcomes for the most vulnerable within and across countries and regions are enhanced through approaches focusing on equity, inclusivity and rights-based approaches. Vulnerability is exacerbated by inequity and marginalisation linked to e.g., gender, ethnicity, low incomes, informal settlements, disability, age, and historical and ongoing patterns of inequity such as colonialism, especially for many Indigenous Peoples and local communities. Integrating climate adaptation into social protection programs, including cash transfers and public works programs, is highly feasible and increases resilience to climate change, especially when supported by basic services and infrastructure. The greatest gains in well-being in urban areas can be achieved by prioritising access to finance to reduce climate risk for low-income and marginalised communities including people living in informal settlements. (*high confidence*) {*4.4, 4.5.3, 4.5.5, 4.5.6*}

C.5.4 The design of regulatory instruments and economic instruments and consumption-based approaches, can advance equity. Individuals with high socio-economic status contribute disproportionately to emissions, and have the highest potential for emissions reductions. Many options are available for reducing emission-intensive consumption while improving societal well-being. Socio-cultural options, behaviour and lifestyle changes supported by policies, infrastructure, and technology can help end-users shift to low-emissions-intensive consumption, with multiple co-benefits. A substantial share of the population in low-emitting countries lack access to modern energy services. Technology development, transfer, capacity building and financing can support developing countries / regions leapfrogging or transitioning to low-emissions transport systems thereby providing multiple co-benefits. Climate resilient development is advanced when actors work in equitable, just and inclusive ways to reconcile divergent interests, values and worldviews, toward equitable and just outcomes. (*high confidence*) {*2.1, 4.4*}

Governance and Policies

C.6 Effective climate action is enabled by political commitment, well-aligned multilevel governance, institutional frameworks, laws, policies and strategies and enhanced access to finance and technology. Clear goals, coordination across multiple policy domains, and inclusive governance processes facilitate effective climate action. Regulatory and economic instruments can support deep emissions reductions and climate resilience if scaled up and applied widely. Climate resilient development benefits from drawing on diverse knowledge. (*high confidence*) {*2.2, 4.4, 4.5, 4.7*}

C.6.1 Effective climate governance enables mitigation and adaptation. Effective governance provides overall direction on setting targets and priorities and mainstreaming climate action across policy domains and levels, based on national circumstances and in the context of international cooperation. It enhances monitoring and evaluation and regulatory certainty, prioritising inclusive, transparent and equitable decision-making, and improves access to finance and technology (see C.7). (*high confidence*) {*2.2.2, 4.7*}

C.6.2 Effective local, municipal, national and subnational institutions build consensus for climate action among diverse interests, enable coordination and inform strategy setting but require adequate institutional capacity. Policy support is influenced by actors in civil society, including businesses, youth, women, labour, media, Indigenous Peoples, and local communities. Effectiveness is enhanced by political commitment and partnerships between different groups in society. (*high confidence*) {*2.2, 4.7*}

C.6.3 Effective multilevel governence for mitigation, adaptation, risk management, and climate resilient development is enabled by inclusive decision processes that prioritise equity and justice in planning and implementation, allocation of appropriate resources, institutional review, and monitoring and evaluation. Vulnerabilities and climate risks are often reduced through carefully designed and implemented laws, policies, participatory processes, and interventions that address context specific inequities such as those based on gender, ethnicity, disability, age, location and income. (*high confidence*) {*4.4, 4.7*}

C.6.4 Regulatory and economic instruments could support deep emissions reductions if scaled up and applied more widely (*high confidence*). Scaling up and enhancing the use of regulatory instruments can improve mitigation outcomes in sectoral applications, consistent with national circumstances (*high confidence*). Where implemented, carbon pricing instruments have incentivized low-cost emissions reduction measures but have been less effective, on their own and at prevailing prices during the assessment period, to promote higher-cost measures necessary for further reductions (*medium confidence*). Equity and distributional impacts of such carbon pricing instruments, e.g., carbon taxes and emissions trading, can be addressed by using revenue to support low-income households, among other approaches. Removing fossil fuel subsidies would reduce emissions[54] and yield benefits such as improved public revenue, macroeconomic and sustainability performance; subsidy removal can have adverse distributional impacts, especially on the most economically vulnerable groups which, in some cases can be mitigated by measures such as redistributing revenue saved, all of which depend on national circumstances (*high confidence*). Economy-wide policy packages, such as public spending commitments and pricing reforms, can meet short-term economic goals while reducing emissions and shifting development pathways towards sustainability (*medium confidence*). Effective policy packages would be comprehensive, consistent, balanced across objectives, and tailored to national circumstances (*high confidence*). {*2.2.2, 4.7*}

C.6.5 Drawing on diverse knowledges and cultural values, meaningful participation and inclusive engagement processes—including Indigenous Knowledge, local knowledge, and scientific knowledge—facilitates climate resilient development, builds capacity and allows locally appropriate and socially acceptable solutions. (*high confidence*) {*4.4, 4.5.6, 4.7*}

[54] Fossil fuel subsidy removal is projected by various studies to reduce global CO_2 emission by 1 to 4%, and GHG emissions by up to 10% by 2030, varying across regions (*medium confidence*).

Finance, Technology and International Cooperation

C.7 Finance, technology and international cooperation are critical enablers for accelerated climate action. If climate goals are to be achieved, both adaptation and mitigation financing would need to increase many-fold. There is sufficient global capital to close the global investment gaps but there are barriers to redirect capital to climate action. Enhancing technology innovation systems is key to accelerate the widespread adoption of technologies and practices. Enhancing international cooperation is possible through multiple channels. (*high confidence*) {*2.3, 4.8*}

C.7.1 Improved availability of and access to finance[55] would enable accelerated climate action (*very high confidence*). Addressing needs and gaps and broadening equitable access to domestic and international finance, when combined with other supportive actions, can act as a catalyst for accelerating adaptation and mitigation, and enabling climate resilient development (*high confidence*). If climate goals are to be achieved, and to address rising risks and accelerate investments in emissions reductions, both adaptation and mitigation finance would need to increase many-fold (*high confidence*). {*4.8.1*}

C.7.2 Increased access to finance can build capacity and address soft limits to adaptation and avert rising risks, especially for developing countries, vulnerable groups, regions and sectors (*high confidence*). Public finance is an important enabler of adaptation and mitigation, and can also leverage private finance (*high confidence*). Average annual modelled mitigation investment requirements for 2020 to 2030 in scenarios that limit warming to 2°C or 1.5°C are a factor of three to six greater than current levels[56], and total mitigation investments (public, private, domestic and international) would need to increase across all sectors and regions (*medium confidence*). Even if extensive global mitigation efforts are implemented, there will be a need for financial, technical, and human resources for adaptation (*high confidence*). {*4.3, 4.8.1*}

C.7.3 There is sufficient global capital and liquidity to close global investment gaps, given the size of the global financial system, but there are barriers to redirect capital to climate action both within and outside the global financial sector and in the context of economic vulnerabilities and indebtedness facing developing countries. Reducing financing barriers for scaling up financial flows would require clear signalling and support by governments, including a stronger alignment of public finances in order to lower real and perceived regulatory, cost and market barriers and risks and improving the risk-return profile of investments. At the same time, depending on national contexts, financial actors, including investors, financial intermediaries, central banks and financial regulators can shift the systemic underpricing of climate-related risks, and reduce sectoral and regional mismatches between available capital and investment needs. (*high confidence*) {*4.8.1*}

C.7.4 Tracked financial flows fall short of the levels needed for adaptation and to achieve mitigation goals across all sectors and regions. These gaps create many opportunities and the challenge of closing gaps is largest in developing countries. Accelerated financial support for developing countries from developed countries and other sources is a critical enabler to enhance adaptation and mitigation actions and address inequities in access to finance, including its costs, terms and conditions, and economic vulnerability to climate change for developing countries. Scaled-up public grants for mitigation and adaptation funding for vulnerable regions, especially in Sub-Saharan Africa, would be cost-effective and have high social returns in terms of access to basic energy. Options for scaling up mitigation in developing countries include: increased levels of public finance and publicly mobilised private finance flows from developed to developing countries in the context of the USD 100 billion-a-year goal; increased use of public guarantees to reduce risks and leverage private flows at lower cost; local capital markets development; and building greater trust in international cooperation processes. A coordinated effort to make the post-pandemic recovery sustainable over the longer-term can accelerate climate action, including in developing regions and countries facing high debt costs, debt distress and macroeconomic uncertainty. (*high confidence*) {*4.8.1*}

C.7.5 Enhancing technology innovation systems can provide opportunities to lower emissions growth, create social and environmental co-benefits, and achieve other SDGs. Policy packages tailored to national contexts and technological characteristics have been effective in supporting low-emission innovation and technology diffusion. Public policies can

[55] Finance originates from diverse sources: public or private, local, national or international, bilateral or multilateral, and alternative sources. It can take the form of grants, technical assistance, loans (concessional and non-concessional), bonds, equity, risk insurance and financial guarantees (of different types).

[56] These estimates rely on scenario assumptions.

support training and R&D, complemented by both regulatory and market-based instruments that create incentives and market opportunities. Technological innovation can have trade-offs such as new and greater environmental impacts, social inequalities, overdependence on foreign knowledge and providers, distributional impacts and rebound effects[57], requiring appropriate governance and policies to enhance potential and reduce trade-offs. Innovation and adoption of low-emission technologies lags in most developing countries, particularly least developed ones, due in part to weaker enabling conditions, including limited finance, technology development and transfer, and capacity building. (*high confidence*) {*4.8.3*}

C.7.6 International cooperation is a critical enabler for achieving ambitious climate change mitigation, adaptation, and climate resilient development (*high confidence*). Climate resilient development is enabled by increased international cooperation including mobilising and enhancing access to finance, particularly for developing countries, vulnerable regions, sectors and groups and aligning finance flows for climate action to be consistent with ambition levels and funding needs (*high confidence*). Enhancing international cooperation on finance, technology and capacity building can enable greater ambition and can act as a catalyst for accelerating mitigation and adaptation, and shifting development pathways towards sustainability (*high confidence*). This includes support to NDCs and accelerating technology development and deployment (*high confidence*). Transnational partnerships can stimulate policy development, technology diffusion, adaptation and mitigation, though uncertainties remain over their costs, feasibility and effectiveness (*medium confidence*). International environmental and sectoral agreements, institutions and initiatives are helping, and in some cases may help, to stimulate low GHG emissions investments and reduce emissions (*medium confidence*). {*2.2.2, 4.8.2*}

[57] Leading to lower net emission reductions or even emission increases.

Scoping Comment Letter 0005

Chong Family <rdbtec@aol.com> 5/15/2024 3:27 PM

Request EIS information Kauai MR

To PMRFPublicAffairs@us.navy.mil <pmrfpublicaffairs@us.navy.mil> • info@pmrf-kpgo-eis.com

---

To whom it may concern,

Like to request information on the EIS being presented for the Pacific Missile Range Facility on Kauai?

Thank-you,
R Chong
Honolulu, Hi 96816

Scoping Comment Letter 0006

Consent for storing submitted data
True

First Name
Valerie

Last Name
Weiss

Add Me to the Project Mailing List
Yes

Street
6616 Alahele St

City
Kapaa

State
HI

Zip code
96746

Email
valerieweiss31@gmail.com

Organization/Affiliation (if any)
Individual

Comments

Please tally my vote as NO on extending the lease at PMRF. This state has already seen the results of toxic pollution by the military. The Navy has had too much leeway in their denying that they are ever to blame. At PMRF spilled PFAS are in our ocean. There are likely many other toxics spilled or dumped that we usually do not get informed on. And stop dumping Naval ships into our ocean claiming they will be reefs. They are junk and do not belong in our waters for any reason including RIMPAC exercises.

Add Attachments (optional)

Submitted on
05/22/2024

Scoping Comment Letter 0007

Puri, Naadia S LT USN (USA) <naadia.s.puri.mil@us.navy.mil> 5/23/2024 8:29 PM
Scope Meeting
To info@pmrf-kpgo-eis.com

Sir/Ma'am,

My name is LT Naadia Puri and I work at Navy Region Pearl Harbor, Oahu. I am unable to make these meetings in person on island, is there a link I can attend to listen to the presentation?

V/R,
LT Naadia Puri

Scoping Comment Letter 0008

Reef A Migita <reef.migita@doh.hawaii.gov> 5/23/2024 9:41 PM

Request for comment on Real Estate EIS -U.S. Navy Pacific Missile Range Facility

To info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com> Copy Darryl C Lum <darryl.lum@doh.hawaii.gov>

Ms. Kerry Wells,

The Department of Health (DOH) Clean Water Branch (CWB) has received the request for comment regarding the U.S. Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA) Environmental Impact Statement (EIS).

As the EIS will evaluate the potential environmental consequences of the Navy's proposal to retain the use of 8,348 acres of State lands presently utilized pursuant to leases and easements on Kaua`i, Hawai`i, for operational continuity and sustainment at the Pacific Missile Range Facility (PMRF), the CWB offers the following comments:

The DOH and County of Kaua`i has settled with Nā Kia`a Kai and Surfrider Foundation to issue one or more draft National Pollutant Discharge Elimination System (NPDES) permits for all outfalls of the Mānā Plain Drainage Ditch System, including but not limited to the outfalls of Kīkīaola Harbor Drain, Kawai`ele Outfall, Nohili Outfall, First Ditch, Second Ditch, and Cox Drain. (The attached settlement agreement substantively represents what the parties agreed to and have filed with the US District Court for the District of Hawaii.)

The Kawai`ele Outfall exists within PMRF's Installation Boundary, as shown on Enclosure (2) – Project Location Map (See 20240510.NAV PAC MISSLE FAC EIS.pdf) and the Navy currently leases the land on the Mānā Plain from the Department of Land and Natural Resources (DLNR) under General Lease No. S-3852 and is responsible for the operation and maintenance of the canals, including the pumps and associated infrastructure. Hence, it appears that the Navy is responsible for discharges from this outfall. The Kawai`ele Outfall is where Kinikini Ditch connects to the open coastal waters abutting the PMRF. In addition, there is another possible outfall (i.e., Nohili Outfall) from within PMRF's jurisdiction and leased area contributing to the discharge that could also be impacted.

The Order for Summary Judgement and Dismissal between Nā Kia`a Kai and Surfrider Foundation, and the State of Hawaii, Agribusiness Development Corporation (ADC), see attached, may affect the Navy even if the Navy was not subject to the case. Consideration should be given to the situation where DLNR land is no longer managed by ADC. What is ADC's current role regarding the subject land and when does this role expire? If ADC is no longer involved with this land, is it the Navy's intent to apply for NPDES permit coverage for the discharges subject to the Order?

Sincerely,

Reef Migita

Engineering Section Supervisor | Environmental Management Division | Clean Water Branch

Hawai'i State Department of Health | Ka 'Oihana Olakino

2827 Waimano Home Road, Room 225 | Pearl City, HI 96782

Office: (808) 586-4309

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recipients is prohibited. If you are not the intended recipient, please contact the sender immediately in a separate e-mail and destroy the original message and any copies.

- 2024-1-30 Settlement Agreement.pdf (315 KB)
- 2019-7-9_Order_re_SJ_and_Dismissal.pdf (308 KB)

DAVID L. HENKIN #6876
KYLIE W. WAGER CRUZ #10165
ELENA L. BRYANT #9548
EARTHJUSTICE
850 Richards Street, Suite 400
Honolulu, Hawai‘i 96813
Telephone No.: (808) 599-2436
Email: dhenkin@earthjustice.org
kwager@earthjustice.org
ebryant@earthjustice.org

Attorneys for Plaintiffs*

IN THE UNITED STATES DISTRICT COURT

DISTRICT OF HAWAI‘I

NĀ KIA‘I KAI, an unincorporated association, and SURFRIDER FOUNDATION, a non-profit corporation, Plaintiffs, v. COUNTY OF KAUA‘I, and ELIZABETH A. CHAR, in her official capacity as Director of Health of the DEPARTMENT OF HEALTH, STATE OF HAWAI‘I, Defendants.	Civil No. 22-00304 DKW-KJM SETTLEMENT AGREEMENT AND ORDER (Remedy Phase); ATTACHMENTS A – B

* Pursuant to Local Rule 10.2(b), please refer to the signature page for the complete list of parties represented.

SETTLEMENT AGREEMENT

WHEREAS, in July 2019, this Court ruled in a previous related lawsuit that discharging pollutants from the Mānā Plain Drainage Ditch System—which has six (6) ocean outfalls including the Kīkīaola Harbor Drain—to the Pacific Ocean without the required National Pollutant Discharge Elimination System ("NPDES") permit violates the Clean Water Act ("CWA"), 33 U.S.C. § 1251 *et seq.*, *see Nā Kiaʻi Kai v. Nakatani*, 401 F. Supp. 3d 1097, 1100, 1103, 1104 (D. Hawaiʻi 2019);

WHEREAS, in July 2018, the Court granted the Director of Health for the State of Hawaiʻi Department of Health's ("DOH's") motion to be dismissed from the previous related lawsuit;

WHEREAS, after the Court issued its July 2019 order in the previous related lawsuit, the State of Hawaiʻi Agribusiness Development Corporation applied for a NPDES permit for all of the Mānā Plain Drainage System outfalls except for the Kīkīaola Harbor Drain;

WHEREAS, since May 15, 2017, if not earlier, the County of Kauaʻi ("County") has been solely responsible (per relevant standard operating procedures) for authorizing discharges from the Kīkīaola Harbor Drain to the Pacific Ocean during times of significant rainfall events (ECF No. 38, ¶3);

WHEREAS, on or about March 31, 2022, the County submitted to DOH a NPDES permit application for discharges to the Pacific Ocean from the Kīkīaola Habor Drain (ECF No. 38, ¶27);

WHEREAS, to date, DOH/the Director of Health has not issued any NPDES permit for any of the Mānā Plain Drainage Ditch System's six (6) outfalls, including the Kīkīaola Harbor Drain;

WHEREAS, on July 14, 2022, Plaintiffs Nā Kiaʻi Kai and Surfrider Foundation (hereinafter, collectively referred to as "Plaintiffs") filed suit in this case against the County and Elizabeth A. Char, in her official capacity as Director of Health of DOH (hereinafter, collectively referred to as "Defendants") alleging that the County was violating the CWA by discharging polluted drainage waters from the Kīkīaola Harbor Drain to the Pacific Ocean without the required NPDES permit (ECF No. 1);

WHEREAS, Plaintiffs named the Director of Health as a necessary party to the action because DOH, through the Director of Health, is responsible for issuing NPDES permits in compliance with the CWA, and because Plaintiffs alleged that DOH had refused to issue a NPDES permit for discharges from the Kīkīaola Harbor Drain (ECF No. 1, ¶26);

WHEREAS, Plaintiffs further requested injunctive relief and civil penalties pursuant to 33 U.S.C. § 1319(d) and 40 C.F.R. § 19.4, among other relief, to

remedy the County's alleged CWA violations (ECF No. 1 at 25-26), as well as an award of litigation costs, including reasonable attorney and expert witness fees, pursuant to 33 U.S.C. § 1365(d);

WHEREAS, on March 31, 2023, Plaintiffs and the County entered into a joint stipulation of facts regarding the County's discharges from the Kīkīaola Harbor Drain (ECF No. 38), which included stipulated facts that the Kīkīaola Harbor Drain collects stormwater runoff from land uses located both on and off of the Waimea 400 Parcel Site that the County owns, including from a gravel and asphalt plant ("Maui Asphalt") and the Waimea Wastewater Treatment Plant ("Waimea WWTP"), and then discharges that stormwater runoff to the nearshore waters of the Pacific Ocean (ECF No. 38, ¶14);

WHEREAS, on March 31, 2023, Plaintiffs moved for summary judgment regarding the County's liability under the CWA for pollution from the Kīkīaola Harbor Drain (ECF No. 39);

WHEREAS, on April 17, 2023, this Court approved and ordered the parties' joint stipulation to bifurcate this action into two phases, *i.e.*, the "Liability Phase" and the "Remedy Phase," to conserve judicial resources and to provide additional time for the parties to explore settlement before incurring substantial further costs (ECF No. 50);

WHEREAS, on May 18, 2023, the County filed its statement of no position on Plaintiffs' motion for summary judgment (ECF Nos. 53 & 54), pursuant to the Plaintiffs' and the County's joint stipulation, approved and ordered by the Court on May 19, 2023, whereby the County agreed to file the statement of no position in exchange for Plaintiffs' agreement not to seek attorneys' fees and civil penalties against the County associated with the "Liability Phase" of this lawsuit (ECF No. 60);

WHEREAS, on June 13, 2023, the Court entered an order granting Plaintiffs' motion for summary judgment, which completely resolved the "Liability Phase" of this lawsuit (ECF No. 65);

WHEREAS, the parties have reached an agreement resolving the "Remedy Phase" of this case;

WHEREAS, the parties have agreed to enter into this Settlement Agreement ("Agreement"), without any admission of fact or law, which they consider to be a just, fair, adequate, and equitable resolution of the "Remedy Phase" of this action; and

WHEREAS, it is in the interest of the public, the parties, and judicial economy to resolve the "Remedy Phase" of this action without protracted litigation;

NOW, THEREFORE, the parties to this Agreement ("Parties") agree, and the Court orders, as follows:

DOH/THE DIRECTOR OF HEALTH OBLIGATIONS

1. Within three hundred sixty-five (365) days of execution of this Agreement, DOH/the Director of Health shall issue one or more draft NPDES permits for all outfalls of the Mānā Plain Drainage Ditch System, including but not limited to the outfalls of Kīkīaola Harbor Drain, Kawai'ele Outfall, Nohili Outfall, First Ditch, Second Ditch, and Cox Drain as identified in *Nā Kia'i Kai v. Nakatani*, 401 F. Supp. 3d 1097, 1100, 1103, 1104 (2019); and *Nā Kia'i Kai v. Cnty. of Kaua'i*, No. 22-CV-00304-DKW-KJM, 2023 WL 3981422, at *4 (D. Haw. June 13, 2023). DOH/the Director of Health shall notify Plaintiffs upon the preparation and public notice of any and all draft NPDES permits pursuant to this Paragraph.

2. DOH/the Director of Health shall issue one or more final NPDES permits for all outfalls of the Mānā Plain Drainage Ditch System, including but not limited to Kīkīaola Harbor Drain, Kawai'ele Outfall, Nohili Outfall, First Ditch, Second Ditch, and Cox Drain as identified in *Nā Kia'i Kai v. Nakatani*, 401 F. Supp. 3d 1097, 1100, 1103, 1104 (2019); and *Nā Kia'i Kai v. Cnty. of Kaua'i*, No. 22-CV-00304-DKW-KJM, 2023 WL 3981422, at *4 (D. Haw. June 13, 2023). For each and every draft NPDES permit prepared and publicly noticed pursuant to Paragraph 1, *supra*, DOH/the Director of Health shall issue a final NPDES permit

within one hundred eighty (180) days of public notice of such draft NPDES permit. DOH/the Director of Health shall notify Plaintiffs upon the issuance of any and all final NPDES permits pursuant to this Paragraph.

3. If DOH/the Director of Health anticipates missing a draft or final NPDES permit deadline set forth in Paragraphs 1 or 2, *supra*, DOH/the Director of Health shall notify Plaintiffs at least thirty (30) days before the missed deadline. Plaintiffs and DOH/the Director of Health shall meet and confer over a period of at least ten (10) days on whether to extend the deadline by agreement. If Plaintiffs and DOH/the Director of Health are unable to reach agreement during the ten (10)-day meet-and-confer period, DOH/the Director of Health may file a motion to extend the deadline based on unforeseen circumstances.

COUNTY OBLIGATIONS

4. The County shall not withdraw its NPDES permit application, submitted to DOH on or about March 31, 2022, for discharges from the Kīkīaola Harbor Drain.

5. Until the DOH/the Director of Health issues a final NPDES permit to the County for discharges from Kīkīaola Harbor Drain, the County shall conduct water quality monitoring via either Department of Public Works employees or third parties under contract as follows:

a. Frequency:

i. Beginning within ninety (90) days of execution of this Agreement, dry weather sampling twice each calendar year (in separate quarters) in water and bed sediment (Note: Bed sediment samples and testing are required for only enterococcus, TPH, PAH, glyphosate, and the extended panel of pesticides (*see* Paragraph 5.b, *infra*)).

ii. Beginning upon execution of this Agreement, wet weather sampling in water for each time that the Kīkīaola Harbor Drain is opened as follows:

1. Upon determining the need to open the Kīkīaola Harbor Drain, the County Department of Public Works shall immediately notify all contractors and subcontractors that are directly or indirectly responsible for sample collection so that samples may be collected as soon as practicable after opening the Kīkīaola Harbor Drain.
2. The County shall make best efforts to sample once as soon as practicable within six (6) hours after opening the Kīkīaola Harbor Drain.
3. If, despite best efforts, the County is unable to conduct wet weather sampling within six (6) hours after opening, the County shall sample once within twelve (12) hours after opening. In addition, within twenty-four (24) hours after opening the Kīkīaola Harbor Drain, the County shall notify Plaintiffs of the failure to conduct wet weather sampling within the six (6)-hour timeframe and the specific reasons therefor.
4. The County shall sample once twenty-four (24) hours after opening, if the outfall is discharging into the ocean.
5. The County shall sample once forty-eight (48) hours after opening, if the outfall is discharging into the ocean.
6. Plaintiffs acknowledge that if the County has not secured an agreement with third-party contractors to conduct the water quality monitoring required under Paragraph 5 of this Agreement before the Kīkīaola Harbor Drain is opened, the County will conduct the wet weather water

quality monitoring required under Paragraph 5 of this Agreement pursuant to an emergency contract.

b. Parameters: Turbidity, all species of nitrogen, phosphorous, enterococcus, TSS, TPH, PAH, glyphosate, and extended panel of pesticides (*see* Attachment A).

c. Holding times: The County shall make best efforts to ensure that water quality testing is conducted within holding times as follows:

Turbidity: 48 hours

All species of nitrogen: 48 hours for NO2; otherwise, 28 days

Phosphorous: 28 days

Enterococcus: 8 hours

TSS: 7 days

TPH: 7 days

PAH: 7 days

Glyphosate: 14 days

Extended panel of pesticides (*see* Attachment A): 7 days

If water quality testing is not conducted within a holding time, the County shall, in its quarterly water quality reporting to Plaintiffs, *see* Paragraph 5.h, *infra*, notify Plaintiffs of the failure to conduct water quality testing within the holding time and the specific reasons therefor.

d. Sampling Location: The ditch between the berm at Kīkīaola Small Boat Harbor and Kaumualiʻi Highway (*see* Attachment B).

e. Flow measurements: The County shall measure flow in the ditch at the same time and location as each dry and wet weather sampling event described in Paragraphs 5.a and 5.d, *supra*;

f. Except for any wet weather sampling conducted under an emergency contract pursuant to Paragraph 5.a.ii.6, *supra*, the County shall prepare a sampling and analysis plan (SAP) outlining the protocols and methods and a quality assurance plan for Plaintiffs' review and input prior to implementation; Plaintiffs acknowledge that the County's third-party contractors will need a minimum of four (4) weeks from their contract notice to proceed (NTP) with the County to coordinate and develop a draft of their SAP;

g. All laboratories conducting water quality testing pursuant to Paragraphs 5.a.i and 5.b, *supra*, will follow quality assurance/quality control protocols; and

h. The County shall provide all testing results and flow measurements to Plaintiffs on a quarterly basis.

6. Waimea 400 Parcel. Beginning within thirty (30) days of execution of this Agreement, the County shall implement the following best management practices to minimize pollution from the Waimea 400 Parcel and the ditches leading to the Kīkīaola Harbor Drain:

a. Pollution control measures including biofilters and absorbent fabric for petroleum products shall be deployed and maintained in the area where equipment is staged; and

b. Any future activity requiring grubbing shall include deployment of erosion control measures including biofilter socks or silt fences.

7. Waimea WWTP. Beginning within thirty (30) days of execution of this Agreement, the County shall implement the following pollution control measures at the Waimea WWTP:

a. Covered storage and secondary containment for lubricating oil, and all fuel shall be stored in approved containers and storage cabinets;

b. Absorbents shall be utilized during repair of the Waimea WWTP pumps and other mechanical equipment to prevent contamination from oil and other petroleum products;

c. Herbicides made with glyphosate shall not be used at the Waimea WWTP;

d. The County shall provide R-1 quality effluent to the Waimea Athletic Field and shall continue to seek new customers for the use of R-1 water;

8. Maui Asphalt. Beginning within thirty (30) days of execution of this Agreement:

a. The County shall conduct quarterly inspections of Maui Asphalt's operations via either a Department of Public Works employee or a third-party inspector under contract. Maui Asphalt's Stormwater Pollution Prevention Program, as per its NPDES Permit from DOH, will be used to develop a best management practice checklist for each potential pollutant source at Maui Asphalt's operation, which the County will use in conducting the quarterly inspections.

b. The County shall provide quarterly updates to Plaintiffs regarding Maui Asphalt's progress on securing a new site for its plant.

NOTIFICATIONS

9. Whenever notifications, reporting, or other communications to Plaintiffs or Defendants are required by this Agreement, they shall be in writing, and be addressed and sent via U.S. Mail and/or electronic mail as follows:

To Plaintiffs in this lawsuit, via Plaintiffs' attorneys of record:

Kylie W. Wager Cruz

Elena L. Bryant
David L. Henkin
Earthjustice
850 Richards Street, Suite 400
Honolulu, Hawai‘i 96813
kwager@earthjustice.org
ebryant@earthjustice.org
dhenkin@earthjustice.org

To Defendant the Director of Health, via the Director of Health's attorneys of record:

Melissa J. Kolonie
Dale K. Sakata
Joanna B.K.F. Yeh
Deputy Attorney General
Department of the Attorney General, State of Hawai‘i
465 S. King Street, Room 200
Honolulu, Hawai‘i 96813
melissa.j.kolonie@hawaii.gov
dale.k.sakata@hawaii.gov
joanna.yeh@hawaii.gov

To Defendant County of Kaua‘i, via the County Engineer and the County's attorneys of record:

Troy Tanigawa
County Engineer
Department of Public Works
County of Kaua‘i
4444 Rice Street, Suite 275
Līhu‘e, Hawai‘i 96766
ttanigawa@kauai.gov

Andrew Michaels
Matthew Bracken
Deputy County Attorney
Office of the County Attorney
County of Kaua‘i
4444 Rice Street, Suite 220
Līhu‘e, Hawai‘i 96766
amichaels@kauai.gov

mbracken@kauai.gov

10. Any Party may, by written notice to the other Parties, change its designated notice recipient or notice address provided in Paragraph 9, *supra*.

ENFORCEMENT OF THE AGREEMENT

11. The United States District Court for the District of Hawai‘i will retain jurisdiction to enforce the terms of this Agreement. *See Kokkonen v. Guardian Life Ins. Co. of America*, 511 U.S. 375 (1994). In granting any motion by Plaintiffs to enforce the terms of the Agreement, the Court shall be limited to ordering specific performance. Should the Court order specific performance and Plaintiffs subsequently seek to enforce that order, the Court shall have available to it all remedies for any violation of the Court's specific performance order.

USE AND EFFECT OF AGREEMENT

12. This Agreement was negotiated and executed by the Parties in good faith to avoid expensive and protracted litigation regarding the "Remedy Phase" of this lawsuit. This Agreement shall not constitute an admission or adjudication with respect to any allegation made by any Party. This Agreement shall not constitute an admission of any wrongdoing or misconduct on the part of Defendants. This Agreement shall not constitute an acknowledgment by Plaintiffs that there was no wrongdoing or misconduct.

13. Plaintiffs reserve their right to bring subsequent actions challenging the adequacy of any NPDES permit that the County may obtain from DOH/the Director of Health. This Agreement shall not constitute an admission by Plaintiffs that the County's compliance with the Agreement satisfies its obligations under the CWA.

14. Plaintiffs and DOH/the Director of Health agree that nothing in this Agreement precludes DOH/the Director of Health from regulating discharges into ditches of the Mānā Plain Drainage Ditch System, in addition to the discharges from the outfalls into the ocean.

15. Plaintiffs and DOH/the Director of Health agree that nothing in this Agreement affects the Director of Health's dismissal from the lawsuit *Nā Kia'i Kai. v. Nakatani*, 401 F. Supp. 3d 1097 (2019).

CIVIL PENALTIES

16. Plaintiffs waive their rights to seek assessment of civil penalties against the County for past discharges and for any discharges that have or will occur during the "Remedy Phase" of the lawsuit through DOH/the Director of Health's issuance of a NPDES permit for the Kīkīaola Harbor Drain.

FEES AND COSTS

17. Plaintiffs reserve their rights to seek recovery from DOH/the Director of Health of attorneys' fees incurred in the "Liability Phase" of this lawsuit

through the Court's June 13, 2023 order granting Plaintiffs summary judgment. Plaintiff have waived their rights to seek recovery from the County of attorneys' fees incurrent in the "Liability Phase" of this lawsuit, as previously stated in paragraph 2 of the Joint Stipulation Between Plaintiffs and Defendant County of Kaua'i Re: Plaintiff's Motion for Summary Judgment, filed May 19, 2023.

18. Plaintiffs waive their rights to seek recovery from the County and DOH/the Director of Health of attorneys' fees incurred in the "Remedy Phase" of the lawsuit, *i.e.* after June 13, 2023, through the Court's approval of this Agreement.

19. Plaintiffs reserve their rights to seek recovery from DOH/the Director of Health of Plaintiffs' costs other than attorneys' fees incurred in the "Liability Phase" or "Remedy Phase" of this lawsuit, through the Court's approval of this Agreement.

20. The County shall remit to Plaintiffs' counsel within 45 days of the execution and delivery of this Agreement FIVE THOUSAND DOLLARS ($5,000), which shall fully satisfy Plaintiffs' claim against the County for costs other than attorneys' fees incurred in the "Liability Phase" and "Remedy Phase" of this lawsuit, through the Court's approval of this Agreement.

21. Once the Court has entered an order dismissing this case with prejudice, Plaintiffs and DOH/the Director of Health will have sixty (60) days to

reach agreement regarding Plaintiffs' claim for an award of attorneys' fees and costs. If Plaintiffs and DOH/the Director of Health are unable to reach agreement on an amount pursuant to the pre-motion meet-and-confer provisions set forth in Local Rule 54.2(d):

a. Plaintiffs and DOH/the Director of Health shall file a joint statement pursuant to Local Rule 54.2(e) within forty-five (45) days after entry of an order dismissing the case with prejudice, and

b. Plaintiffs shall file a motion for attorneys' fees and costs within (60) days after the Court's entry of an order dismissing the case with prejudice.

22. Plaintiffs reserve their rights to seek recovery from the County and DOH/the Director of Health of attorneys' fees and costs incurred in enforcing the terms of this Agreement after the Court's approval of this Agreement.

AUTHORIZATION TO SIGN

23. This Agreement shall apply to and be binding upon the Parties, their members, delegates, and assigns. The undersigned representatives certify that they are authorized by the Party or Parties they represent to enter into this Agreement and to execute and legally bind that Party or Parties to the terms and conditions of this Agreement.

Executed this 30th day of January, 2024.

/s/ Kylie W. Wager Cruz

DAVID L. HENKIN
KYLIE W. WAGER CRUZ
ELENA L. BRYANT
EARTHJUSTICE

Attorneys for Plaintiffs
NĀ KIA‘I KAI and SURFRIDER FOUNDATION

/s/ Andrew Michaels

MATTHEW M. BRACKEN #10267
County Attorney
ANDREW MICHAELS #10407
Deputy County Attorney
Office of the County Attorney
4444 Rice Street, Suite 220
Līhu‘e, Hawai‘i 96766
T: (808) 241-4930
Email: mbracken@kauai.gov
amichaels@kauai.gov

Attorneys for Defendant
COUNTY OF KAUA‘I

/s/ Dale K. Sakata

MELISSA J. KOLONIE #10109
DALE K. SAKATA #5861
JOANNA B.K.F. YEH #7764
Deputy Attorneys General
Department of the Attorney General, State of Hawai‘i
465 South King Street, Room 200
Honolulu, Hawai‘i 96813
T: (808)587-3050
Email: melissa.j.kolonie@hawaii.gov
dale.k.sakata@hawaii.gov
joanna.yeh@hawaii.gov

Attorneys for Defendant
ELIZABETH A. CHAR, in her official capacity as Director of Health of the STATE OF HAWAI‘I DEPARTMENT OF HEALTH

APPROVED AND SO ORDERED

DATED:

_____

UNITED STATES DISTRICT COURT

DISTRICT OF HAWAI‘I

NA KIA‘I KAI, an unincorporated association, SURFRIDER FOUNDATION, a non-profit corporation, and PESTICIDE ACTION NETWORK NORTH AMERICA, a non-profit corporation, Plaintiffs, v. JAMES NAKATANI in his official capacity as Executive Director of the STATE OF HAWAI‘I AGRIBUSINESS DEVELOPMENT CORPORATION, Defendant.	CIVIL NO. 18-00005 DKW-RLP **ORDER RE: SUMMARY JUDGMENT AND DISMISSAL**

INTRODUCTION

Plaintiffs Na Kia‘i Kai, Surfrider Foundation, and Pesticide Action Network North America (Plaintiffs) seek injunctive and declaratory relief for alleged violations of the Clean Water Act (CWA), 33 U.S.C. §§1251-1311(a), and breach of public trust under Haw. Const. art. XI §§1, 6, as a result of discharges from the Mānā Plain near Kekaha, Kauai, Hawaii into the Pacific Ocean. Plaintiffs seek summary judgment on both claims, while Defendant Nakatani, as Director of the

State of Hawai‘i Agribusiness Development Corporation (ADC or the State), seeks summary judgment on the CWA claim and dismissal of the public trust claim. Plaintiffs also seek to strike an expert report filed by the State as part of its summary judgment briefing.

For the reasons set forth below, Plaintiffs' Motion for Summary Judgment is GRANTED IN PART as to the CWA claim but DENIED as to the public trust claim. The State's Motion for Partial Summary Judgment as to the CWA claim is DENIED, but the Motion to Dismiss the public trust claim is GRANTED. Plaintiffs' Motion to Strike is DENIED as moot.

FACTUAL BACKGROUND

The Area

The Mānā Plain on Kaua‘i's western coast contains naturally-occurring wetland areas that have been drained for agricultural production. Defendant's Concise Statement of Facts in Support of Motion for Partial Summary Judgment (Defendant SOF), Dkt. No. 56, ¶1-2; Plaintiffs' Concise Statement in Opposition to Motion for Partial Summary Judgment (Plf. Opp. SOF), Dkt. No. 66, ¶2. To drain the area, a system of unlined drainage canals was built below the natural water table to draw water out of the wetlands. To avoid water standing in the

drainage canals, pumps were installed to draw water through the canals, lift the water up and over coastal dunes, and pump it into the ocean. *Id.* This drainage system consists of forty miles of earthen, unlined canals and ditches, two pumping stations at Kawai‘ele and Nohili, and six outfalls where water discharges from the canal system into the Pacific Ocean. Plaintiffs' Concise Statement of Facts in Support of Motion (Plaintiff SOF), Dkt. No. 52, ¶2. In addition, in order to discharge water from some of the outfalls, excavators are used to open sand berms and allow water from the canals to drain into the ocean. *Id.* ¶¶3, 5.

This century-old drainage system, originally built for a sugar mill operated by the Kekaha Sugar Company (KSC), has been controlled and managed by ADC since 2001. Defendant SOF ¶5. The 7000-acres of Mānā Plain land controlled and managed by ADC now contains several operations, including the Pacific Missile Range and various commercial facilities. Defendant SOF 3; Plaintiffs' Motion for Summary Judgment, Dkt No. 51, (Plf. MSJ), at 14. In addition, the town of Kekaha is located in the Mānā Plain. *Id.*

The Mānā Plain borders the Pacific Ocean for approximately nine miles. Plf. MSJ at 8. The adjacent ocean waters are used extensively for recreation, including for fishing and swimming. *Id.*, 14. In 2014 and 2018, the Hawai‘i

Department of Health reported to the EPA that the waters in popular beaches in the area were not meeting state water quality standards, threatening the designated uses of the water. *Id.,* Hawai‘i Water Quality Monitoring Report (2014 and 2018), Ex. 37-38.

The CWA and NPDES permits

Except where authorized by a National Pollutant Discharge Elimination System (NPDES) permit, the CWA bans the discharge of pollutants into waters of the United States ("WOTUS"). The NPDES permit system requires regulating, monitoring, and public reporting of pollutants discharged into such waters. 40 C.F.R. §122. The EPA administers the NPDES permit system but authorizes states that meet minimum requirements to stand in its shoes. FAC ¶6 (citing 33 U.S.C. §1342; 40 C.F.R. §23.24). DOH administers the NPDES permitting system in Hawai‘i. Answer, Dkt. No. 18, ¶18.

In 2008, the EPA promulgated the Water Transfer Rule (WTR), which created a new exemption from NPDES permitting requirements where a water transfer activity (WTA) "conveys or connects waters of the United States without subjecting the transferred water to intervening industrial, municipal, or commercial use" and does not add pollutants to the water. 40 C.F.R. §122.3(i).

As the operator of the Mānā Plain drainage ditch system (the System), KSC obtained an NPDES permit, which regulated the discharge of pollutants from the System into the Pacific Ocean. Defendant's Concise Statement in Opposition (Def. Opp. SOF), Dkt No. 68, ¶9. ADC assumed ownership of the System and its NPDES permit in 2001, administratively extending the permit until 2011 when it submitted an NPDES renewal application. Defendant SOF ¶6; FAC ¶60.

In 2015, ADC withdrew its application to renew the System NPDES permit in reliance on the WTR exemption. *Id*. ¶61. As of August 3, 2015, ADC has been without an NPDES permit for the drainage ditch system, which continues to discharge waters into the Pacific Ocean. FAC ¶16; Answer ¶2.

The Pollution

The System collects groundwater and surface waters, including stormwater from ADC's agricultural tenants and stormwater and groundwater containing pollutants from ADC's non-agricultural tenants, and discharges those waters to the nearshore waters of the Pacific Ocean. Plaintiff SOF ¶14. Several of ADC's tenants who sublicense land adjacent to the drainage ditches pollute water that enters the drainage ditch system. *Id*. 17-20. For example, Shredco permits runoff containing pesticides from its green waste material processing operations to

enter the drainage ditch system. Plaintiff SOF ¶18. Another ADC sublicensee, Pohaku, runs a mining and rock crushing operation that emits stormwater runoff, which flows into the System. Plaintiff SOF ¶19.

The Kawai‘ele Outfall is the most active of the System's six. Alone, it discharges millions of gallons of water every day from the System into the Pacific Ocean. Plaintiff SOF ¶4. Other System outfalls similarly discharge into the nearshore marine waters within three miles of the coast, occasionally requiring the movement of sand berms by excavator before doing so. *Id.* at ¶¶4, 13. These discharged waters contain sediment and sand from the drainage ditch system, as well as chemicals that seep into the drainage ditch system, including amniomethylphosphonic acid (AMPA), a degradate of glyphosate; dichlorodiphenyldichloroethylene (DDE), a degradate of dichlorodiphenyltrichloroethane (DDT); glyphosate, ametryn, atrazine, bentazon, chlorpyrifos, cispropiconazole, diuron, fipronil, hexazinone, MCPA, metolachlor, prometryn, propoxur, simazine, and trans-propiconazole. *Id*. ¶¶8-9. These waters also contain phosphorus, metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, zinc), sulfide, phenols, antimony, beryllium, selenium, thallium, and bis-phthalate. *Id*. ¶11.

PROCEDURAL BACKGROUND

On January 16, 2018, Plaintiffs filed a First Amended Complaint (FAC) alleging violations of the CWA and of the public trust by ADC.[1] Dkt. No. 9. On April 3, 2019, Plaintiffs filed a Motion for Summary Judgment (Plf. MSJ). Dkt. Nos. 51-54. On the same day, Defendant filed a Motion for Partial Summary Judgment and Motion to Dismiss (Defendant MSJ). Dkt. Nos. 55-58. These Motions have been fully briefed. Dkt. Nos. 65, 67, 71, 72. On May 5, 2019, Plaintiffs filed a Motion to Strike, for which briefing is also complete. Dkt. Nos. 63, 74, 75. On May 22, 2019, the Court held a hearing on the cross-motions for summary judgment, Defendant's Motion to Dismiss, and Plaintiffs' Motion to Strike. Dkt. No. 77. This disposition follows.

LEGAL STANDARDS

Motion for Summary Judgment

Pursuant to Federal Rule of Civil Procedure 56(a), a party is entitled to summary judgment "if the movant shows that there is no genuine dispute as to any

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[1]The FAC also named as a Defendant Hawai'i Department of Health Director, Virginia Pressler. Ms. Pressler has since been dismissed from this action pursuant to this Court's July 2018 Order (Dkt. No. 37) granting Defendant's Motion to Dismiss (Dkt. No. 14).

material fact and the movant is entitled to judgment as a matter of law." The moving party is entitled to judgment as a matter of law when the non-moving party fails to make a sufficient showing on an essential element of a claim in the case on which the non-moving party has the burden of proof. *Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986). In assessing a motion for summary judgment, all facts are construed in the light most favorable to the non-moving party. *Genzler v. Longanbach*, 410 F.3d 630, 636 (9th Cir. 2005).

Motion to Dismiss

Federal Rule of Civil Procedure 12 allows a defendant to move for dismissal of a claim on the grounds of, *inter alia*, lack of subject matter jurisdiction and failure to state a claim upon which relief can be granted. Fed.R.Civ.P. 12(b)(1), (6). "Although sovereign immunity is only quasi-jurisdictional in nature, Rule 12(b)(1) is still a proper vehicle for invoking sovereign immunity from suit." *Pistor v. Garcia*, 791 F.3d 1104, 1111 (9th Cir. 2015).[2] A defendant may,

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[2]*Cf. Sato v. Orange Cty. Dep't of Educ.*, 861 F.3d 923, 927 (9th Cir.), *cert. denied*, 138 S. Ct. 459 (2017) ("A sovereign immunity defense is 'quasi-jurisdictional' in nature and may be raised in either a Rule 12(b)(1) or 12(b)(6) motion.") (citing *Pistor v. Garcia*, 791 F.3d 1104, 1111 (9th Cir. 2015), and *Eason v. Clark Cty. Sch. Dist.*, 303 F.3d 1137, 1140 (9th Cir. 2002)).

however, be found to have waived sovereign immunity if it does not invoke its immunity in a timely fashion and takes actions indicating consent to the litigation. *See id.*; *Hill v. Blind Indus. & Servs. of Md.*, 179 F.3d 754, 760 (9th Cir.), *amended on denial of reh'g*, 201 F.3d 1186 (9th Cir. 1999).

DISCUSSION

I. Motion for Summary Judgment

Plaintiffs' first count alleges ADC has violated the CWA by discharging pollutants via its drainage ditch system into the waters of the United States without an NPDES permit since August 2015. FAC at 1. Plaintiffs further assert that Nakatani, as director of ADC, ordered ADC to do so. *Id.* Both sides have filed cross-motions for summary judgment on this claim. Dkt. Nos. 51, 55.

ADC asserts that despite the System operating pursuant to an NPDES permit for decades, no NPDES permit is needed now because of the Water Transfer Rule. According to the State, the drainage ditches that comprise the System -- like the Pacific Ocean -- are Waters of the United States (WOTUS), the System pumps at Nohili and Kawai'ele are water transfer activities (WTA), and the WTR exempts WTAs between two WOTUS from NPDES permit requirements. Defendant's Opposition to Plaintiffs' Motion for Summary Judgment (Def. Opp), Dkt. No. 68,

at 19. Plaintiffs do not agree. They respond that (1) the System is not a WOTUS, and the WTR therefore does not apply; (2) the WTR does not apply even if the System transfers water between two WOTUS because pollutants are added to the water during the WTA; and (3) the WTR is invalid. Plaintiffs' Opposition to Defendant's Motion for Partial Summary Judgment, Dkt. No. 65 (Plf. Opp.) at 1-2.

The Court need not reach Plaintiffs' third argument because the first and second are dispositive: the System does not involve transfers between WOTUS and, regardless, the addition of pollutants during the would-be WTA excepts it from applicability of the WTR exemption. Plaintiffs' Motion for Summary Judgment is therefore GRANTED with respect to Count I, and Defendant's Motion for Partial Summary Judgement is DENIED.

A. The CWA Violation

Plaintiffs assert that ADC's discharge of water from the System into the Pacific Ocean meets all five elements of a CWA violation. Plf. MSJ at 23. These five elements include: (1) a discharge (2) of pollutants (3) into navigable waters (4) from a point source (5) without an NPDES permit. *Id*. ADC disputes that element four has been satisfied, arguing that under the applicable definitions, the System is not a point source of pollution but rather a navigable waterway that is

therefore a WOTUS. Def. Opp. at 9-14. As a WOTUS, the System is considered a "donor water," and the pollutants that ADC discharges into the "receiving waters," the Pacific Ocean, are exempt from NPDES permit requirements by the WTR. *Id*., at 19.

Plaintiffs have established, and ADC admits, that ADC discharges water from the System via the Kawai'ele Outfall into the Pacific Ocean. *Id*., at 2. Indeed, ADC discharges millions of gallons of water daily from Kawai'ele. Plf. MSJ at 23 (citing Ex. 31, Kurano Deposition). Several other System outfalls discharge intermittently. Defendant's Motion for Partial Summary Judgment (Def. MSJ), Dkt. No. 55, at 12. Four outfalls "drain into the nearshore marine waters along West Kaua'i by opening sand berms in the outfalls with an excavator." Plf. MSJ at 24 (citing Ex. 34, ADC Standard Operating Procedure). Plaintiffs have easily shown the first element of a CWA violation.

Plaintiffs have also met element two, that the discharged waters contain pollutants. The CWA defines pollutants as, among other things, "chemical waste, biological material… rock, sand…industrial, municipal, and agricultural waste…" 33 U.S.C. §1362(6). Sediment is also a pollutant. 33 U.S.C. §1314(a)(4); *Natural Res. Def. Counc. v. U.S. EPA*, 863 F.2d 1420, 1424 n.4 (9th Cir. 1988).

The System carries groundwater and stormwater runoff through unlined canals and ditches where it gathers sediment and dirt. Plf. MSJ at 25-26 (citing Ex. 21, Bond Decl.) Plaintiffs have also shown that the water in the System contains pesticide residue, heavy metals and toxins.[3] Plf. MSJ at 26-28. ADC's own sampling shows the presence of chlorophyll, nitrogen, ammonia nitrogen, and nitrate-nitrite, which are all pollutants. *Id*., Ex. 33, ADC Daily Monitoring Results. And ADC's own NPDES Renewal Application indicates that the drainage water contains "suspended solids" which are understood to be sediment. *Id.,* NKK004442. Even the groundwater itself that flows into and through the System is considered a pollutant under the CWA because its pH differs from that of the Pacific Ocean into which it discharges. *See Nat. Res. Def. Council, Inc. v. U.S. E.P.A.,* 863 F.2d 1420, 1424 (9th Cir. 1988) (citing 33 U.S.C. § 1314(a)(4)

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[3]ADC quibbles with Plaintiffs' characterization of the water quality survey results (Dkt. No. 53, Ex. 40). Def. Opp. SOF ¶1. ADC argues that water quality tests were conducted on water in the drainage ditch near the Kawai'ele Pump Station, rather than in the Pacific Ocean, and therefore do not reflect the resulting level of pollutants in the ocean. *Id*.; Dkt. No. 53, Ex. 19 at 18. However, ADC does not dispute that the water in the drainage ditch is polluted at the levels the State's water quality report indicates nor does ADC dispute that the water, polluted as it is, is discharged into the Pacific. As such, the distinction appears to be of little consequence. Of note, the absence of information regarding levels of pollution at the outfalls is exactly the information vacuum that would be remedied if ADC was required to obtain an NPDES permit.

(1982)). Further, Plaintiffs' expert hydrologist concludes that, because of the structure of System, groundwater flowing to the drainage ditch is likely contaminated with seepage from a nearby landfill and domestic cesspools outside the Mānā Plain. Plf. MSJ at 19. Although ADC challenges the characterization of the extent of the pollution, it does not dispute that the second element of a CWA violation is met.

Third, Plaintiffs assert that the nearshore area of the Pacific Ocean surrounding Kaua'i is a navigable waterway and is protected under the CWA. *See* 33 U.S.C. §§1362(7-8). Notably, the polluted water discharges from the drainage ditch into the Pacific Ocean in an area containing popular beaches used for water recreation, including Barking Sands Beach and Kekaha Beach Park. Plf. MSJ at 14. The third element is therefore also met.

It is undisputed that, since 2015, ADC has been without an NPDES permit for its discharge of waters from the System into the Pacific Ocean. Def. MSJ at 4; Answer ¶¶2, 7. Element five has therefore also been met.

B. The System Is Not a WOTUS

The parties disagree on the fourth element of a CWA violation, which requires a point source of pollutants. Under Plaintiffs' theory, the System is a

point source of pollution. Plaintiffs assert that "the System and its outfalls fall under the express definition of 'point source' because they are 'discernible, confined and discrete conveyance[s],' and are 'ditch[es] [or] channel[s],' which the Clean Water Act expressly defines as point sources." Plf. MSJ at 31 (quoting 33 U.S.C. §1362(14)). Forty years of NPDES permitting support Plaintiffs' assertion that the System is a point source of pollution.

Under ADC's theory, the System is not a point source of pollution. ADC asserts that, notwithstanding the decades of classifying the System as a point source, the proper classification of the System is as a WOTUS or jurisdictional water under 40 C.F.R. §122.2. Specifically, ADC asserts that, based on an EPA consultant's determination, the water in the drainage ditch system should be considered a protected WOTUS, rather than a point source of pollutants into the ocean. Def. Opp. at 14 (citing Hayes Decl. ¶24-25).[4] ADC explains that, because there is no longer a single point source of industrial pollution (the KSC sugar mill) entering the drainage ditch system, the drainage ditch is now properly treated as its own protected waterway under the CWA. Thus, in ADC's view,

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[4]Plaintiffs have moved to strike the Hayes Declaration.

some of ADC's sublicensees' activities may be point sources of pollution requiring NPDES permits,[5] but the System itself is not a point source of pollution to the ocean. According to ADC, Hawai'i DOH agreed and, following ADC's consultant's direction, reclassified the System as a "receiving water" that should be considered a "state jurisdictional water" such that industrial point-source pollution should be regulated as it enters the System.[6] Def. Opp. SOF ¶9; Def. Opp. at 5.

This reclassification of the System from a point source to a WOTUS is suspect for several reasons. First, treating the drainage ditch system as a WOTUS or jurisdictional water does not comport with the history of the System's use and regulation. Second, the change in how the System is classified is not justified by any intervening change in law or relevant change in circumstances. Third, the reclassification of the System as a WOTUS undermines the purpose of the CWA.

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[5]Under the CWA, agricultural irrigation return flows do not qualify as a point-source of pollution. CWA §402(1)(1-2); CWA §502(14). Thus, many of ADC's tenants do not require NPDES permits for the pesticide-laden runoff that enters the ditch system. Plaintiffs argue that mixed with this agricultural runoff is industrial stormwater runoff that does require a permit. Plaintiff SOF ¶18. Plaintiffs, for instance, allege that Pohaku is an industrial point source and the HDOH has required them to obtain an NPDES permit, which they have failed to do. *Id.* ¶19. That dispute need not be resolved here.

[6]Plaintiffs dispute whether Hawaii DOH has in fact made that determination and, if it has, whether the determination is even proper for consideration here. Plf. Reply at 6.

The history and use of the System indicate an origin, role and purpose entirely different from those waterways protected under the CWA. The drainage ditches were built to create agricultural land from a previously existing wetland. Defendant SOF ¶¶2-4. This System was created, in other words, so that KSC could use the land to produce sugar. The canals and water pumps were used to carry the drained water to the Pacific Ocean so that the polluted water would not stand in or overflow the ditches. *Id.*

For decades, the System was regulated as such. During the many decades of the existence of the drainage ditches and water pumps draining polluted water from the Mānā Plain into the Pacific Ocean, KSC obtained NPDES permits for the System. Plf. MSJ at 20. Those NPDES permits regulated the discharge of the System's waters *into the ocean*.[7] Def. Opp SOF. ¶9. KSC, as operator of the System, was not required to regulate its discharge of pollutants at the point at which they entered the drainage ditch system. *Id.* The history of permitting indicates that the System was viewed as a means of transporting polluted discharge

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[7]Defendant's Statement of Facts here relies on the Hayes Declaration which Plaintiffs moved to strike. However, the basis of the Motion to Strike is not this fact and in any case the Motion to Strike is moot.

into the Pacific Ocean and was viewed in its totality as the point source of pollution, not as a protected, navigable waterway. Recognizing the System for what it is—a series of drainage ditches carrying polluted waters—the State regulated the point at which the System discharged into the waterway the State *did* seek to protect: the Pacific Ocean.

Nothing about the subsequent change in ownership in 2001 from KSC to ADC indicates that the System, which has remained structurally unchanged, should now suddenly be treated as a WOTUS, navigable waterway, or jurisdictional water. Nothing about the structure of the drainage ditches, canals and water pumps has changed since ADC took over from KSC as the operator of the System.

What has changed is the use of the surrounding land, with the proliferation of sources of pollution from one company (KSC) to many companies as sublicensees of KSC's successor (ADC).[8] But this change in land use and owner does nothing to change the structure of the System itself. Just as was the case during KSC's operational years, some of the surrounding businesses (now ADC's

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[8]Notably, even during the time of KSC's operation of the System, various commercial uses of the land surrounding the System already existed. Defendant SOF ¶3.

sublicensees) may not add pollutants to the System, some may add pollutants to the System via exempt means (such as agricultural irrigation return flow), and some may add pollutants through non-exempt means (such as industrial runoff from Pohaku and, previously, KSC). But the nature of ADC's use of the land (through its sublicensees) has not changed the nature of the System and therefore provides no logical support for reclassifying the System from a point source of pollution to a WOTUS.

ADC argues that its classification of the System as a WOTUS is supported by state and federal law. Citing to the CWA and various cases, ADC varyingly argues that the drainage ditches are "canals," "navigable waters," and "tributaries," and that they have a "significant nexus" to jurisdictional waters, such that they are themselves WOTUS. Def. Opp. 12-17. ADC also asserts that the State has classified the System as a State Water and argues that such classification in the State translates into a classification of the System as a WOTUS under the CWA. Def. MSJ at 8-9. Plaintiffs dispute whether the System satisfies any of the definitions of WOTUS offered by ADC. Plaintiffs' Reply in Support of Motion for Summary Judgment (Plf. Reply), Dkt. No. 71, at 3-5. Citing extensive case law, Plaintiffs argue that the groundwater drawn into the System precludes

classification as a WOTUS and that the State's capacious definition of a State Water is inconsequential to the federal definition of a WOTUS. *Id.*

The Court need not resolve the ultimate question of whether the drainage ditch system operated here could ever be classified as a WOTUS because, while the law, as cited by ADC, may allow certain drainage ditch systems to be considered WOTUS, it does not require the Court to disregard how this System has historically been classified and regulated, and what it, in fact, is: a means to convey and discharge polluted water into the Pacific. In more than forty years of NPDES regulation, the System has never been treated as a WOTUS. In the several decades of NPDES regulation, no effort was ever made to regulate the level of pollution entering the System, as would be required if it were a WOTUS under the CWA; no effort was made to keep the System's waters in a usable condition either. The cases and statutory definitions cited to by ADC that indicate a system of drainage ditches *could be* a WOTUS predate ADC's first application to renew the System NPDES permit, such that those definitions could have been relied upon to argue for the System to be treated as a WOTUS. *See* Def. Opp. at 9-17 (citing *Headwaters, Inc. v. Talent Irrigation Dist*., 243 F.3d 526, 533 (9th Cir. 2001); *North Carolina Shellfish Growers Assoc v. Holly Ridge Assocs.,* LLC., 278

F.Supp.2d 654, 672 (2003). Yet neither ADC nor Hawai‘i DOH ever sought to do so, and indeed, ADC's withdrawn NPDES renewal application can easily be viewed as advancing the same position on the applicability of the CWA as that advanced by Plaintiffs here. *See* ADC NPDES Renewal Application, February 25, 2011, Dkt. No. 53-4.

No intervening change in the WOTUS definition warranted ADC and Hawai‘i DOH's efforts to reclassify the System either. The only arguably relevant regulatory change that did occur was the promulgation of the EPA's WTR in 2008, which exempts polluted waters transferred into a receiving WOTUS from requiring an NPDES permit, *but only if the donor water is itself a WOTUS*. Plf. Reply at 8 (citing 40 C.F.R. 122.3(i) ("water transfer means activity that conveys or connects water of the United States[…]")). The State's reclassification of the System as a WOTUS seeks solely to take advantage of the WTR exemption. The reclassification, in other words, appears opportunistic, rather than factually based, especially where, as here, ADC seeks to twist a law intended to protect waterways to do exactly the opposite.

Importantly, it is Defendant's burden to show that its pollutant-laden discharge from the System falls under an exemption to the CWA. *See N. Cal.*

River Watch v. City of Healdsburg, 496 F.3d 993, 1001 (9th Cir. 2007), cert. denied, 552 U.S. 1180 (2008) (burden on polluter to prove applicability of regulatory exemption from "waters of the United States"); *United States v. Akers*, 785 F.2d 814, 819 (9th Cir.), cert. denied, 479 U.S. 828 (1986) (the burden falls on the polluter to prove its activities are statutorily exempt from Clean Water Act Section 404, 33 U.S.C. § 1344). ADC's unfounded claim that the System has suddenly changed from a point source of pollution to a WOTUS without any intervening changes to the definition of a WOTUS, to the interpretation of the definition, or to the physical structure or function of the System itself, does not satisfy this burden.

Finally, ADC offers that "HDOH's determination that the Canals are the receiving Jurisdictional Water" cannot be contradicted here without bringing suit against HDOH. Def. Opp. at 17-18. ADC's argument relies on a convoluted interpretation of Plaintiffs' claims, treating Plaintiffs' argument that no exemption to the NPDES permit requirement applies as a challenge to the State's law defining State jurisdictional waters. Plaintiffs make no such challenge to the State's laws, and the Court need not address such a hypothetical.

Moreover, the potential conflict between the instructions and demands of State permitting authorities and this Court's Order suggested by ADC are not proper for consideration here. This Court is not limited in its authority to evaluate CWA violations by the State's laws. *Ass'n to Protect Hammersley, Eld, & Totten Inlets v. Taylor Res., Inc.*, 299 F.3d 1007, 1012 (9th Cir. 2002). While an agency determination is ordinarily afforded deference in some circumstances, ADC has nowhere shown an EPA determination at all—rather, ADC has suggested what the EPA's views might be via ADC's reliance on a contractor's opinion. Plf. Reply at 7; Def. Opp at 4 ("the contractor's assessment was that an NPDES permit was no longer necessary, as there was no longer an industrial point source discharging."). If the State's interpretation of its own laws create a conflict with CWA jurisprudence, or the EPA later makes a determination about the need for an NPDES permit, and those determinations put ADC in an impossible position, that conflict can be resolved by ADC at a later time.

C. The WTR Does Not Apply Because of the Added Pollutant Exception

Building on the unsound premise that the System is a WOTUS, ADC argues that "any discharge from the Canals into the Pacific Ocean is a water transfer from Jurisdictional Water into another. By definition, this activity does not require a

NPDES permit." Def. Opp. at 4 (relying on the EPA's WTR). According to the State, the WTR, codified at 40 C.F.R. §122.3, allows transfers of water from one WOTUS to another without an NPDES permit, even where it might transfer "the most loathsome navigable water in the country into the most pristine one." Def. Reply at 10 (quoting *Friends of Everglades v. S. Fla. Water Mgmt. Dist.*, 570 F.3d 1210, 1226 (11th Cir. 2009).

However, even assuming, *arguendo*, that the System and the Pacific Ocean into which it discharges are both WOTUS, the transfers at issue here are not exempt under the WTR because *pollutants are added during the transfer*. 40 C.F.R. §122.3(i)(the water transfer exclusion "does not apply to pollutants introduced by the water transfer activity itself to the water being transferred.").

Here, it is uncontested that the System's "forty miles of unlined, earthen drainage ditches add pesticide-laden sediment to the transferred waters…" Plf. Opp. at 2; Answer ¶16; Plaintiff SOF ¶¶7-8;[9] Dkt. No. 53 (Plf. Ex. 25: ADC

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[9]Although ADC disputes SOF ¶¶7-8, it does so only to the extent that the statements suggest that the samples taken from the drainage ditches surrounding the outfalls, which show the presence of pesticides, were actually taken from the Pacific Ocean. Def. Opp SOF ¶1. These facts are here used only to support the assertion that the drainage ditches themselves add pesticide-laden sediment to the water. ADC did not object to the statement that "the discharge waters contain sediment from the banks and bottoms of the Mānā Plain Drainage Ditch System." Plaintiff SOF

NPDES Permit Renewal Application (Feb. 25, 2011) at NKK004444-NKK00444540; Ex. 39: Alfredo Lee Letter (Nov. 28, 2011) at ADCID000143-ADCID000174, ADCID000179-ADCID000180, ADCID000190-ADCID000191; Ex 40: Statewide Pesticide Sampling Project, at NKK000215); Dkt. No. 52 (Bond Decl. ¶¶140-145; Ex. 21: Erosion Images); First Amended Complaint ¶74. ADC instead argues that the proper conception of the water transfer activity is not to look at the entire System, including those forty miles of unlined ditches through which pollutants are added, but rather to focus on the two pumps at Kawai‘ele and Nohili. Def. Reply at 11-12. Based on this conception of the WTA, ADC argues that the proper inquiry is whether those pumps add pollutants to the transferred water. *Id.* ADC asserts they do not. *Id.*

ADC has the burden of proving that it is eligible for an exemption to the CWA. *United States v. First City Nat'l Bank of Houston*, 386 U.S. 361, 366 (1967) (holding that a party claiming an exception must prove that they acted within the exception). Further, the Court must narrowly construe "claims of an

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¶7. Moreover, in its Answer, ADC admits to FAC ¶74, which states that, "ADC [] self-reported testing results to DOH on or about November 28, 2011. The testing results show the presence of [numerous pollutants] at the Nohili Outfall and Second Ditch." *See* Answer ¶16.

exemption, from the . . . permitting requirements of the [CWA's] broad pollution prevention mandate . . . to achieve the Act's purpose." *N. California River Watch v. City of Healdsburg,* 496 F.3d 993, 1001 (9th Cir. 2007).

Plaintiffs argue that the ditches, the water pumps that draw water through these ditches and pump it into the Pacific Ocean, and the excavation of the sand berms that allows water to flow into the Pacific Ocean should all be viewed collectively as the water transfer activity. Plaintiffs here rely on the plain language of the statute describing a WTA as an "engineered activity" to argue that ADC has failed to establish that the entire engineered System should not be considered part of the WTA. In furtherance of that argument, Plaintiffs have shown via expert testimony, and ADC does not dispute, that the unlined ditches were purposefully built below the natural water table at Mānā Plain to draw water from the surrounding wetlands into the ditches, and the pumps at the end of these ditches then draw that water from throughout the forty-mile system into the Pacific Ocean. And because these miles of "unlined, earthen canals" are "integral parts of the [WTA]" and the "unvegetated and unstable banks are sources of detached sediment […] contaminated with pesticides[…,]" that System is not an exempt WTA because it adds pollutants. Plf. Opp. at 14-17. Plaintiffs' construction is

surely the proper, and, indeed, the only sensical one. The pumps focused on by the State have no water to draw, move, or ultimately discharge without the ditches purposefully built to first collect that water. That logically leads to the conclusion that the entire System represents the water transfer activity, not the pumps studied in isolation.

Certainly, ADC offers citations to ambiguous regulatory language in which the EPA refers to a water transfer "facility" or "structure" to suggest that the EPA itself intended the term WTA to apply only to an *isolated* structure. Def. Reply at 12 (quoting *National Pollutant Discharge Elimination System (NPDES) Water Transfers Rule*, 73 FR 33697-01, at 33704.). If that were true, the regulation at Section 122.3, or elsewhere, could have said so. It strains credulity, however, to interpret a water transfer activity to mean only a pump or other single structure when the "engineered activity" clearly involves much more than that.

Moreover, as ADC itself identifies, in promulgating the WTR, the EPA described a WTA, stating, "[t]ypically water transfers route water through tunnels, channels, and/or natural stream water features, *and* either pump or passively direct it for uses such as[…] flood control." Def. Opp. at 20 (quoting Federal Register, vol. 73- 115, at 33697 (June 13, 2008)) (emphasis added). The structure of the

sentence suggests that the channels through which water passes and the pumps that move and discharge it are *collectively* considered the water transfer. There is nothing in the language of the rule or EPA's explanation of the rule that suggests the forty miles of unlined ditches and canals at issue here should be excluded from consideration as part of the WTA. In fact, the rule appears to contemplate those exact structures, to include pumping stations, pipes, canals and other structures "used solely to facilitate the transfer of water," as WTAs. *Id*. at 33704

The sole case upon which ADC relies for its crabbed view of the WTA is a non-controlling Eleventh Circuit case applying the WTR. Def. Reply at 12. In *Friends*, the court was similarly faced with a system of canals and a water pump facility pumping polluted water into Lake Okeechobee. *Friends of Everglades v. S. Fla. Water Mgmt. Dist.,* 570 F.3d 1210, 1222 (11th Cir. 2009). ADC relies on *Friends* to argue that the pumps alone are the WTA because the canals that were part of the system in *Friends* were treated as WOTUS, such that the only activity transferring water between two WOTUS—and therefore the only WTA at issue—were the pumps. But nothing in the holding in *Friends* indicates that the court there was asked to parse the meaning of a "water transfer activity" or to determine whether the canals were WOTUS. Indeed, in *Friends,* the court stated, "it is

undisputed that . . . Lake Okeechobee *and the canals* are 'navigable waters." *Id.* at 1216 (emphasis added). In light of that undisputed fact, the court's treatment of the canals as the donor WOTUS and the pumps as the WTA is of little assistance in defining the proper limits of the WTA under the circumstances presented here. Here, unlike in *Friends,* the status of the ditches as WOTUS is heavily disputed. And nothing in the opinion suggests that the history or structure of the system of canals and pumps in *Friends* resembles the System here, such that it can readily answer the question of whether the ditches are properly considered WOTUS or part of the WTA (or both). ADC has provided no Ninth Circuit case law to support its proposed interpretation of the WTA to exclude the pollutant-adding canals and drainage ditches.

With competing definitions of WOTUS and WTA, and little authority cited to offer guidance, the Court cannot find that ADC has satisfied its burden of proving that an exemption applies under the WTR. Because the ditches are logically considered part of the WTA, and because they add pollutants during the transfer activity, the WTR does not exempt the discharge from the System into the Pacific Ocean from NPDES permit requirements.

D. Conclusion

The parade of horribles ADC sets forth is unmoving. ADC claims that "should the water transfer cease, the Mānā Plain would be inundated with water, causing extensive adverse effects to the Pacific Missile Range Facility, Kekaha town residences and commercial businesses, and agriculture and other uses on the Plain." Def. Opp. at 3. Of course, Plaintiffs do not ask the Court to enjoin ADC's discharge of water from the System; they ask only that the Court require ADC to obtain an NPDES permit to do so. Flooding of the Mānā Plain and military sites is not the proximate outcome of a requirement that ADC resume its efforts to obtain permits for the activities it previously conducted under NPDES requirements. Rather, ADC's compliance with NPDES permitting requirements will generate more data gathering and facilitate additional public scrutiny of its water discharges, as was the case prior to 2015.

There is no question that ADC discharges polluted water into the near-shore waters of the Pacific Ocean off Kauai's western coast on a daily basis via the Mānā Plain drainage ditch system, and that it does so without an NPDES permit. It is undisputed that the water discharged contains various pesticides and agricultural chemicals, byproducts of agricultural chemicals, and heavy metals, as well as

sediment from the unlined canals through which it passes. It is further undisputed that these pollutants include those from which the CWA seeks to protect waterways and that the near-shore waters of the Pacific Ocean are protected under the CWA. Thus, no material facts remain in dispute. *See Celotex Corp. v. Catrett*, 477 U.S. 317, 323 (1986). The undisputed facts show that each of the five elements of a CWA violation are present. The undisputed facts also show that the WTR does not apply to exempt the State's conduct from the application of the CWA because pollutants are added to the water flow during the transfer.

The Court GRANTS Plaintiffs' Motion for Summary Judgment on Count I and DENIES Defendant's Counter-Motion on the same.

II. Motion to Dismiss

In Count II, Plaintiffs allege that the same conduct on which their CWA claim is based also amounts to the State's violation of its public trust duties under the Hawai'i State Constitution, Article XI; Hawai'i Revised Statutes ("HRS") § 342D-4; and Hawai'i Administrative Rules ("HAR") § 11-54-1.1(b). Plaintiffs move for summary judgment on this Count, arguing that "ADC has violated and continues to violate its public trust duties… by failing to conserve and protect the nearshore marine waters along West Kaua'i." Plf. MSJ at 43. ADC moves to

dismiss this claim for lack of subject matter jurisdiction. Def. MSJ at 13. It argues that because "Plaintiffs have cited to no federal laws or regulations to support their [public trust] claim," ADC has immunity in this Court "under the Eleventh Amendment and the principles of sovereign immunity." *Id.*

Plaintiffs do not contest the applicability of the Eleventh Amendment to their state-law claims against ADC. Instead, they assert that ADC expressly waived this defense by not moving to dismiss this count sooner and by "admitting that so long as Plaintiffs' federal claims remain pending, this Court has pendent jurisdiction over Plaintiffs' public trust claim." Plf. Opp. at 35.

The application of the Eleventh Amendment and principles of sovereign immunity to Plaintiffs' state-law breach of public trust claim against Nakatani in his official capacity is not reasonably disputed. Because the Court determines that Nakatani has neither expressly waived the defense of sovereign immunity nor implicitly waived it based upon his conduct in this matter, Defendant's Motion to Dismiss Count II is GRANTED. Plaintiffs' Motion for Summary Judgment as to this Count is DENIED.

A. Relevant Procedural Background

On January 16, 2018, Plaintiffs filed their FAC, naming Nakatani in his official capacity as Director of ADC and Virginia Pressler in her official capacity as Director of DOH. Dkt. No. 9. The FAC included three causes of action: (1) CWA and HRS § 342D-50(a) claims against Nakatani; (2) a breach of public trust claim against Nakatani; and (3) a breach of public trust claim against Pressler. FAC ¶¶28- 29. Pressler moved to dismiss Plaintiffs' sole claim against her for public trust violations under state law, based upon the State's sovereign immunity. Dkt. No. 26. Nakatani joined in Pressler's motion. Dkt. No. 32. On July 13, 2018, the Court granted Pressler's Motion to Dismiss Count III. Dkt. No. 37. On April 3, 2019, after the completion of discovery, ADC filed a Motion to Dismiss Count II. Dkt. No. 54.

B. Sovereign Immunity Bars State Law Claims Against ADC in Federal Court

The Eleventh Amendment provides that "[t]he Judicial power of the United States shall not be construed to extend to any suit in law or equity, commenced or prosecuted against one of the United States by Citizens of another State, or by Citizens or Subjects of any Foreign State." U.S. Const. amend. XI. "A State

may waive its sovereign immunity at its pleasure, *College Savings Bank v. Florida Prepaid Postsecondary Ed. Expense Bd.*, 527 U.S. 666, 675–676 (1999), and, in some circumstances, Congress may abrogate it by appropriate legislation. But absent waiver or valid abrogation, federal courts may not entertain a private person's suit against a State" or its agent sued in his or her official capacity. *Virginia Office for Prot. & Advocacy v. Stewart*, 563 U.S. 247, 253–54 (2011) (footnote omitted).

Here, the Eleventh Amendment immunizes Nakatani, a state official sued in his official capacity, from state law claims brought in this court. *Will v. Michigan Dep't of State Police*, 491 U.S. 58, 66 (1989); *Pennhurst State Sch. & Hosp. v. Halderman*, 465 U.S. 89, 100 (1984); *Sato v. Orange Cty. Dep't of Educ.*, 861 F.3d 923, 928 (9th Cir. 2017). *See* FAC ¶8 ("James Nakatani, in his official capacity as Director Agribusiness Development Corporation [is] breaching [his] public trust duties to conserve and protect water resources, including nearshore marine and inland waters, under article XI, §§ 1 and 6 of the Hawai'i Constitution."). Thus, to the extent Plaintiffs seek declaratory and/or prospective injunctive relief via

their state-law claims against Nakatani, those claims are barred by the Eleventh Amendment, and no exception applies.[10]

C. The State Has Not Waived Sovereign Immunity

Plaintiffs do not contest the initial application of sovereign immunity to Count II. However, they contend that the State waived any such defense through litigation conduct that was incompatible with an intent to preserve that immunity. The Ninth Circuit explains that "Eleventh Amendment immunity is an affirmative defense that must be raised 'early in the proceedings' to provide 'fair warning' to the plaintiff." *Aholelei v. Dep't of Pub. Safety*, 488 F.3d 1144, 1147 (9th Cir. 2007) (quoting *Demshki v. Monteith*, 255 F.3d 986, 989 (9th Cir. 2001) (quoting *Hill v. Blind Indus. & Servs. of Md.*, 179 F.3d at 761), *amended by* 201 F.3d 1186 (9th Cir. 2000)) (internal citation omitted). Because such immunity is an affirmative defense, it can be waived. *Id*. "The test employed to determine

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[10]Under the *Ex Parte Young* doctrine, *see* 209 U.S. 123 (1908), a federal court may enjoin a state official's future conduct when a plaintiff brings suit alleging a violation of federal law, *Edelman v. Jordan*, 415 U.S. 651, (1974), but not where, as here, a plaintiff alleges a violation of state law. *Pennhurst*, 465 U.S. at 106 (stating that "when a plaintiff alleges that a state official has violated state law," then "the entire basis for the doctrine of *Young* ... disappears"); *see also McNally v. Univ. of Hawaii*, 780 F. Supp. 2d 1037, 1056 (D. Haw. 2011) (discussing *Ex Parte Young* doctrine).

whether a state has waived immunity 'is a stringent one.'" *In re Bliemeister*, 296 F.3d 858, 861 (9th Cir. 2002) (quoting *In re Mitchell*, 209 F.3d 1111, 1117 (9th Cir. 2000)). "A state generally waives its immunity when it 'voluntarily invokes [federal] jurisdiction or . . . makes a 'clear declaration' that it intends to submit itself to [federal] jurisdiction.'" *Id*. (quoting *In re Lazar*, 237 F.3d 967, 976 (9th Cir. 2001)) (alterations in original). "Express waiver is not required; a state 'waive[s] its Eleventh Amendment immunity by conduct that is incompatible with an intent to preserve that immunity.'" *Id*. (quoting *Hill*, 179 F.3d at 758).

Plaintiffs offer two justifications for their waiver argument. Neither is persuasive. The State did not sit on its Eleventh Amendment rights, wait until late in the proceedings, or act in a manner inconsistent with an intent to preserve its sovereign immunity. Nor has the State made a clear declaration or otherwise conducted itself in a way to cause anyone to reasonably believe that it intends to submit to federal jurisdiction with respect to Plaintiffs' state-law claims. Plaintiffs' assertions to the contrary are unsupported.

First, the waiver arguments set forth by Plaintiffs here are nearly identical to those set forth in opposition to Pressler's Motion to Dismiss, which this Court

granted. Dkt. No. 37. The analysis here does not differ and need not be repeated.

Next, Plaintiffs argue that ADC waived its sovereign immunity defense by waiting to file a Motion to Dismiss ten months after the Court granted Pressler's motion on the same grounds. Plf. Opp. at 36. However, in his Motion for Joinder in Pressler's Motion to Dismiss, Nakatani stated that he would be filing a similar motion regarding the state law claims against him in this case. *Id*. (citing Dkt. No. 32). There is no unfair delay here because Plaintiffs had ample notice of Nakatani's intent to file the Motion now before the Court.

Moreover, the Court notes that Ninth Circuit case law reflects a clear aversion to finding waiver based on an assertion that sovereign immunity was invoked too late in a proceeding. Specifically, in *Ashker v. Cal. Dep't of Corr.*, 112 F.3d 392, 394 (9th Cir. 1997), the Ninth Circuit concluded that a sovereign immunity defense had not been waived because it had been raised in the defendants' answer and pretrial statement, even though the defendants did not otherwise litigate the defense in the district court, litigating it for the first time on appeal. *Ashker* is not an anomaly either. In *Gamboa v. Rubin*, 80 F.3d 1338, 1350 (9th Cir. 1996), *vacated on other grounds as recognized in Hill v. Blind*

Indus. & Services of Md., 179 F.3d at 763, the State of Hawai‘i raised the defense of sovereign immunity only in its answer, and then proceeded to litigate the substance of the case before the district court by filing a motion for summary judgment. The Ninth Circuit, in particularly definitive language, concluded that the State had not waived the defense of sovereign immunity, stating: "That Hawai‘i did not raise the issue in the district court except in its answer does not amount to a waiver of immunity." Here, even prior to this Motion to Dismiss, ADC raised its sovereign immunity defense as the "Third Affirmative Defense" in its Answer, stating, "Plaintiffs' claims are barred against ADC under the doctrine of sovereign immunity." Answer ¶31. Another Ninth Circuit case, *Hill v. Blind Indus. & Services of Md.*, 179 F.3d at 763, is equally instructive. In *Hill*, the Ninth Circuit concluded that sovereign immunity *had been waived, but only* because the defense was raised for the first time on the opening day of trial. *Id*. at 763. The defense had never been raised, not even in an answer, prior to that time. Under these far from demanding standards, ADC's sovereign immunity defense is timely.

Further, ADC neither voluntarily invoked federal jurisdiction nor made a "clear declaration" that it intended to submit itself to federal jurisdiction. *Cf. Lapides v. Bd. of Regents of Univ. Sys. of Ga.*, 535 U.S. 613, 624 (2002) (holding a

state waived its Eleventh Amendment immunity by removing the case to federal court). Contrary to Plaintiffs' assertion, ADC's statement in its answer that "this Court may exercise supplemental jurisdiction *only if* Plaintiffs' CWA claims remain pending" is not an express waiver of immunity or invocation of federal jurisdiction. Answer, Dkt. No. 18, ¶14. Instead, it is an indication that ADC acknowledged only a limited basis for this Court's jurisdiction. Under these circumstances, the Court will not infer a waiver of sovereign immunity where the facts indicate precisely the opposite intent, based upon the State's conduct in this litigation.

The Motion to Dismiss based on sovereign immunity is timely, and the State neither expressly nor impliedly waived that defense at any time. The Motion to Dismiss Count II is therefore GRANTED.

CONCLUSION

For the foregoing reasons, Plaintiffs' Motion for Summary Judgment is GRANTED IN PART with respect to Count I (violation of the CWA) and DENIED IN PART as to Count II (state-law violation of public trust). Defendant's Motion for Partial Summary Judgment on Count I is DENIED. Pursuant to the Eleventh Amendment and principles of sovereign immunity,

Defendant is immune from suit in this court with respect to the breach of public trust claims, and Defendant's Motion to Dismiss Count II is therefore GRANTED. Plaintiffs' Motion to Strike is DENIED as moot.

IT IS SO ORDERED.

DATED: July 9, 2019 at Honolulu, Hawai'i.

Derrick K. Watson
United States District Judge

Scoping Comment Letter 0009

Jordan Lemke <jlemke2015@yahoo.com>
Comments on Proposed Use of State Lands in Kōke'e
To info@PMRF-KPGO-EIS.com **Reply To** Jordan Lemke

5/24/2024 5:39 PM

Aloha,

Mahalo for allowing the opportunity to provide comments on the proposed use by the Navy and NASA of 8,371 acres on Kaua'i.

Upon further review of the Environmental Impact Statement Preparation Notice, I offer the following comments;

We do not have enough 'āina to be awarding nearly 8,500 acres to the Navy and NASA. The lease rate is abhorrent and if the real estate action is approved, should come at a much higher price. Lessons learned from Red Hill, Kaho'olawe, and Mākua Valley should not be ignored when considering this "real estate action".

The continued military presence in Hawai'i does not at all offer a sense of protection to residents. Ask anyone living in Aiea on O'ahu if they feel safer knowing the military is storing jet fuel in their pu'u's. Ask residents of Kaua'i if they feel safer knowing ordnance's are being stored in our pali's.

Section 1.3.3 states - On Kaua'i, the Navy is the largest high-tech employer and third largest overall employer. It employs approximately 900 military and civilian personnel and contributes approximately $150 million annually in salary, contract goods, and services to the local economy. Moreover, as described in Section 1.3.6, Environmental Management and Stewardship, the Navy actively manages the natural and cultural resources at PMRF for the leased and easement lands.

The poor choice of Hawai'i leaders to continue to rely on tourism and the military complex as its main source of income is not something to ride home about. The COVID-19 pandemic proved the tourism point in spades. The deadly fires in Maui on August 8 left residents wondering what exactly it was that the military did to support that situation. The National Guard had to be flown in before any real aid was offered despite having thousands of military personnel already here. Again, Red Hill, Kaho'olawe, and Mākua Valley are all prime examples of how the military are not good 'āina stewards.

Section 1.4 states - By ensuring continued Navy and NASA operations on Kaua'i, the real estate action would also preserve local jobs and income for the residents of Kaua'i, financially contribute to the overall economic wellbeing of Kaua'i, and maintain continued conservation management of natural and cultural resources on State lands at no cost to the State of Hawai'i.

How does this real estate action contribute to the overall economic well-being of Kaua'i? I wonder if residents really feel as though their well-being is improved by the over-presence of the military in the pae 'āina?

Lastly, the most appropriate stewards of 'āina are the ones who have generational ties to this 'āina. Not the Navy, nor NASA. As modern-day colonizers of these islands, we as haoles need to recognize that the appropriate people to be informing us on how to steward 'āina are the Kānaka 'Ōiwi. Rather than the Navy or NASA being the leaseholders, why not designate these lands as conservation lands and ensure perpetual public access? It seems aloof and albeit arrogant, for the Navy and NASA to be under the impression they are the highest and best landowners for these spaces.

Mahalo for allowing the public to comment. It would be a shock to me if this real estate action did not get approved as the corruption in this state, and especially Kaua'i county is rampant. But know, the residents are watching and our patience is running very thin with the status quo.

Jordan Loudon
Wailua Homesteads Resident

Scoping Comment Letter 0010

Consent for storing submitted data
True

First Name
Inette

Last Name
Miller

Add Me to the Project Mailing List
Yes

Street
POB3561

City
Lihue

State
HI

Zip code
96766

Email
Inette.Miller@outlook.com

Organization/Affiliation (if any)
The Return Voyage

Comments

No Action Alternative.

Add Attachments (optional)

Submitted on
05/24/2024

Scoping Comment Letter 0011

Consent for storing submitted data
True

First Name
Iokepa

Last Name
Imaikalani

Add Me to the Project Mailing List
Yes

Street
4471B Kai Ikena Drive

City
Kalaheo

State
HI

Zip code
96741

Email
Iokepa@ReturnVoyage.com

Organization/Affiliation (if any)
The Return Voyage

Comments
No action alternative.

Add Attachments (optional)

Submitted on
05/24/2024

Scoping Comment Letter 0012

Timothy Chee <timothy.chee@hawaii.gov> 5/30/2024 3:22 PM

EIS Preparation Notice for Pacific Missile Range Facility and Kōke'e Park-LD0501

To Info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com> Copy Kevin E Moore <kevin.e.moore@hawaii.gov> • Timothy Chee <timothy.chee@hawaii.gov>

Aloha

Please see the attached reply from the Department of Land and Natural Resources.

Mahalo
Timothy Chee
Land Agent

- REPLY WITH COMMENTS -LD0501-KAUAI PACIFIC MISSILE RANGE EIS NOTICE V.2.pdf (1 MB)

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

May 30, 2024

LD 0501

Cardno GS-AECOM Pacific Joint Venture
Attention: Michele Lefebvre
737 Bishop Street
Suite 3050
Honolulu, HI 96813

Via email: info@PMRF-KPGO-EIS.com

SUBJECT: **EIS Preparation Notice for Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Action, Kekaha and Waimea Districts, Island of Kauai, Hawaii, TMK: Various**

Thank you for the opportunity to review and comment on the subject project. The Land Division of the Department of Land and Natural Resources (DLNR) distributed copies of your request to DLNR's various divisions for their review and comment.

Enclosed are comments received from our Engineering Division. Should you have any questions, please feel free to contact Timothy Chee via email at *timothy.chee@hawaii.gov*. Thank you.

Sincerely,

Russell Tsuji

Russell Y. Tsuji
Land Administrator

Attachments
cc: Central Files

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE
MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

May 8, 2024

LD 0501

MEMORANDUM

FROM: ~~TO:~~

DLNR Agencies:
X Div. of Aquatic Resources *(via email: kendall.l.tucker@hawaii.gov)*
X Div. of Boating & Ocean Recreation (*via email: richard.t.howard@hawaii.gov)*
X Engineering Division *(via email: DLNR.Engr@hawaii.gov)*
X Div. of Forestry & Wildlife *(via email: Rubyrosa.T.Terrago@hawaii.gov)*
X Div. of State Parks (curt.a.cottrell@hawaii.gov)
X Commission on Water Resource Management *(via email: DLNR.CWRM@hawaii.gov)*
X Office of Conservation & Coastal Lands *(via email:Sharleen.k.kuba@hawaii.gov)*
X Land Division – Kauai District *(via email: alison.neustein@hawaii.gov)*
X Aha Moku *(via email: leimana.k.damate@hawaii.gov)*

TO: ~~FROM:~~ **Russell Y. Tsuji, Land Administrator** *Russell Tsuji*

SUBJECT: **EIS Preparation Notice for Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Action**

LOCATION: **Pacific Missile Range: Kekaha, Island of Kauai, Hawaii**
Kōke'e Park Geophysical Observatory: Waimea, Island of Kauai. Hawaii
TMKs: Various

APPLICANT: **Office of Planning and Sustainable Development**

Transmitted for your review and comment is information on the above-referenced project. The document will be available on the Environmental Review Program's website as of the date of publication, May 8, 2024. Please submit any comments to *timothy.chee@hawaii.gov* at the Land Division by the internal deadline of **May 27, 2024**. If no response is received by this date, we will assume your agency has no comments. If you have any questions, please contact Timothy Chee at the above email address. Thank you.

BRIEF COMMENTS:

Attachments

Cc: Central Files

( ) We have no objections.
(✓) We have no comments.
( ) We have no additional comments.
( ) Comments are included/attached.

Signed: CS
Print Name: Carty S. Chang, Chief Engineer
Division: Engineering Division
Date: May 23, 2024

From: DBEDT OPSD Environmental Review Program <dbedt.opsd.erp@hawaii.gov>
Sent: Thursday, May 2, 2024 2:33 PM
To: info@PMRF-KPGO-EIS.com
Cc: DLNR.LD.Land <dlnr.land@hawaii.gov>
Subject: EIS Preparation Notice for Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Action

Aloha,

For your use in disseminating notice of the availability of the subject EISPN and informing readers of the June 17, 2024 deadline to submit comments, here is the link to where the document will be available on the Environmental Review Program's website as of the date of publication, May 8, 2024 (please advise readers that an error message may be received if the link is used prior to that date):

https://files.hawaii.gov/dbedt/erp/Doc_Library/2024-05-08-KA-EISPN-PMRF-and-Kokee-Park-Geophysical-Observatory-Real-Estate-Action.pdf

Please contact me should you have any questions regarding this matter.

Sincerely,

Tom Eisen
Senior Planner, Environmental Review Program
Office of Planning and Sustainable Development
State of Hawai'i
(808) 586-4185
thomas.h.eisen@hawaii.gov

NOTE: The Environmental Review Program's primary role is to facilitate Hawai'i's environmental review process by providing relevant guidance and support to agencies, applicants, consultants, interest groups, and the public. The ERP is not authorized to make determinations on Environmental Assessments, Environmental Impact Statements or exemptions. Pursuant to Chapter 343, Hawai'i Revised Statutes, all such determinations are made by appropriate State or county agencies, county Mayors or the Governor.

Scoping Comment Letter 0013

Surfrider Foundation Kauai Chapter <surfriderkauai@gmail.com>
EIS Scoping Comments PMRF-KPGO
To info@pmrf-kpgo-eis.com

5/31/2024 5:21 PM

Show images **External images are not shown to avoid potential tracking**
Always show images from surfriderkauai@gmail.com

Surfrider Foundation
PO Box 819
Waimea, HI 96796

Thank you for the notice of the Pacific Range Missile Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO) Environmental Impact Statement (EIS) scoping process.

The Surfrider Foundation is a national coastal environmental organization. The Missile Range Facility is sited on the coast of Kauai.

PMRF is far more than a missile range. PMRF hosts submarine training, experiments with ocean sonar, both active and passive. PMRF has also been known to have military beach landing experiments and practice during Rim of the Pacific (RIMPAC) War "Games." PMRF has an airport and has been known to have experimental aircraft testing. There have been rumors of torpedo testing that has harmed local whales.

Our first comment is that honest EIS scoping is impossible to do because everything done at PMRF is closed off and classified. The public has no idea of the dangers they might face from PMRF activities and experiments. The EIS process should be transparent and inclusive, allowing for meaningful public participation. It is vital that the community is kept informed and has ample opportunity to provide input throughout the process.

Our second comment is recurring. The Navy writes its own EIS and then the Navy certifies its own EIS. From our point of view, that is unethical and unfair and not in the spirit of the National Environmental Protection Act. We request an independent body prepare the DRAFT EIS.

Further scoping comments:

An environmental assessment of the natural lands around PMRF should be done and compared to the last EIS. Have the coastal lands and wetlands been enhanced or degraded? Have endangered species increased or decreased from the last EIS? The EIS should address the potential impacts on local flora and fauna, especially endangered species and their habitats. The analysis should include the effects of noise, light pollution, and any chemical byproducts that may affect the ecosystem. Please update and compare the Environmental Baseline Survey for the lowland area that was done over 20 years ago and complete a new Environmental Baseline Survey for the mauka (inland) area.

The EIS should assess how climate change will affect the facility's operations and how the facility might contribute to climate change. This includes evaluating greenhouse gas emissions and potential increases in sea levels. That should include emissions from small boats, submarines, tow motors, missiles, airplanes and helicopters.

The water table at PMRF should be evaluated for military toxins. Groundwater contaminants were found in the past. Also, there had been a flame-retardant spill in the past. This is particularly important since there is a commercial shrimp farm adjacent to PMRF. Is the Shrimp Farm water contaminated?

PMRF has facilities from the World War II era. Are there any impacts?

What is the condition of the fuel tanks at PMRF? When will they be replaced? How do they differ from Red Hill, Oahu?

Please evaluate the impacts of explosive ordinance stored at the leased facilities at PMRF.

Please evaluate the danger to the public of trucks carrying ordinance, jet fuel, missiles and military weapons on Kaua'i highways.

How is the solid waste managed?

How is sewage managed?

Please look at the electromagnetic radiation radar effects on the soldiers, Koke'e residents and on local bird wildlife. Does the radar affect civilian weather use or boating navigation?

The land around PMRF was formerly agricultural, much of it still in agriculture. What are the Navy's intentions and what are the impacts? PMRF leased land is in an extreme fire danger area. Are there mitigations they could do to lessen the danger?

It is crucial that the EIS explores alternative strategies that could minimize environmental and social impacts. Additionally, the document should outline clear mitigation measures to address any potential adverse effects.

Rob Brower, Chair
Surfrider Foundation, Kaua'i Chapter

--
www.kauai.surfrider.org
Facebook: Surfrider Kauai

If you do not wish to receive e-mails from Surfrider Kauai, please reply with UNSUBSCRIBE in the subject line.

Scoping Comment Letter 0014

Consent for storing submitted data
True

First Name
Charles

Last Name
King

Add Me to the Project Mailing List
Yes

Street
4990 Mahua St.

City
Koloa

State
HI

Zip code
96756

Email
cgking@me.com

Organization/Affiliation (if any)

Comments

I am in full support of renewing all the leases to the Navy at PMRF. I have been in business on Kauai for 50years and have always found them to be good neighbors. I remember, in particular, their support of our citizens and local government during Hurricane Iniki.

Add Attachments (optional)

Submitted on
06/03/2024

Scoping Comment Letter 0015

Consent for storing submitted data
True

First Name
David

Last Name
Phillips

Add Me to the Project Mailing List
Yes

Street
379 Kaholalele road

City
Kapaa

State
HI

Zip code
96746

Email
dphilhawaii@gmail.com

Organization/Affiliation (if any)

Comments
How much does the Navy pay the State total to lease the lands?

Add Attachments (optional)

Submitted on
06/04/2024

Scoping Comment Letter 0016

Consent for storing submitted data
True

First Name
Marjorie

Last Name
Gifford

Add Me to the Project Mailing List
Yes

Street
3-3400 Kuhio Hwy C307

City
Lihue

State
HI

Zip code
96766

Email
mfitting.gifford@gmail.com

Organization/Affiliation (if any)

Comments

Land use: Because of the high demand from both residents and tourists for the use of our beaches, it is almost impossible to get a parking place with beach access espedically on Saturdays and Sundays. If pmrf did not occupy and obstruct so much of our beachland, it would provide greater access to our residents. It is too time consuming to try to obtain a beach permit at pmrf AND the choice beach is not available except on one day at the beginning of July. LAND USE: Further, we need flat lands available on which to build housing for our low income people. Our workers are leaving the island because they cannot find housing or rentals. Leaving the pmrf areas available for the county to develop for low income housing would be a boon to our county. LAND USE: This land belongs to the Sovereign Hawaiian Kingdom and should be returned to it.

Add Attachments (optional)

Submitted on
06/04/2024

Scoping Comment Letter 0017

Consent for storing submitted data
True

First Name
Dylan

Last Name
Ramos

Add Me to the Project Mailing List
No

Street

City

State

Zip code

Email

Organization/Affiliation (if any)

Comments

The Navy and NASA should stop all PMRF operations and consider the serious concerns regarding cultural resources, land use, environmental justice, national defense, and more that have been raised for years by Native Hawaiian organizations, environmental groups, and grassroots, community-based movements.

Add Attachments (optional)

Submitted on
06/04/2024

Scoping Comment Letter 0018

Consent for storing submitted data
True

First Name
Lilley

Last Name
Lilley

Add Me to the Project Mailing List
Yes

Street
59-436 MAKANA RD

City
HALEIWA

State
HI

Zip code
96712

Email
underwater2web@gmail.com

Organization/Affiliation (if any)

Comments

I am the marine biologist from Hanalei Kauai that documented the Navy killing the coral reefs along Kauai north shore with their microwave radar towers and electromagnetic discharge into the sea from submarines from 2012 to 2014. Navy produced radiation breaks down the calcium carbonate structure of the coral killing the reef. I have all the science proving this and I presented that to PMRF commander and legal team in 2015. The Navy needs to include in their EIS the effects of microwave radar towers, electromagnetic, plasma energy weapons and other forms of radiation used for surveillance underwater. By ignoring the effects of these energy sources the Navy would be violating the US Endangered Species Act as they operate in the habitat of the protected sea turtles, monk seals and endangered seabirds. Here is a movie I did on the subject in 2014 that I supplied to Congress. We have a great deal of new science done on the subject now from marine corrosion test to "skin effect" testing.
https://www.youtube.com/watch?v=YwTElEv5OX4&authuser=0

Add Attachments (optional)

Submitted on
06/05/2024

Scoping Comment Letter 0019

Consent for storing submitted data
True

First Name

Last Name

Add Me to the Project Mailing List
No

Street

City

State

Zip code

Email

Organization/Affiliation (if any)

Comments

The navy has threatened the very life that sustains the citizens it's supposed to protect by poisoning the water and damaging our ecosystem. End this unnecessary suffering now so our planet and people have a chance

Add Attachments (optional)

Submitted on
06/05/2024

Scoping Comment Letter 0020

Consent for storing submitted data
True

First Name
Eric

Last Name
Nguyen

Add Me to the Project Mailing List
No

Street

City
Mililani

State
HI

Zip code
96789

Email

Organization/Affiliation (if any)

Comments

Allowing the Navy to construct facilities in Koke'e would be introducing an inevitable environmental disaster. The Navy has a long history of showing zero competency and an unacceptable lack of transparency with the public in terms of being able to manage its own facilities and Hawaii's cultural & natural resources. The latest of many examples include Red Hill, Kamokala, and the ongoing contamination of lands at Joint Base Pearl Harbor. The effects of any sort of mishap would be too costly of a burden for the County of Kauai and State of Hawaii to handle. Installations on the island of Kauai already disrupt natural wildlife (i.e. PMRF and nesting birds). The impacts of equipment placed atop Koke'e must be studied to exhaustion, to not only wildlife, but to native flora, effects on local hydrology and geology, and with serious consideration of input from the people of Hawaii. Koke'e must be treated as a vital natural resource and preserved for the current generation as well as future generations. No more military development!

Add Attachments (optional)

Submitted on
06/05/2024

Scoping Comment Letter 0021

Consent for storing submitted data
True

First Name

Last Name

Add Me to the Project Mailing List
No

Street

City

State

Zip code

Email
kellicad3@gmail.com

Organization/Affiliation (if any)
Kaua'i Historical Society

Comments

Aloha, I'm a resident of Kaua'i, born and raised, and I am very interested in the results of the EIS and the overall process of the DOD's request to renew their lease. As an involved member of our West Side community, I have various concerns. I hope this report can be transparent about the following: -within the current plot of 8000+ acres, what kind of cultural, Hawaiian sites are there? What kind of care and protection is designated in those spaces. - how much live ammunition is tested on this property, what is the process of clean up after testing? - what kind of chemicals do these heavy metals/materials leave behind in the groun? Does it have any effect on nearby water sources? - What kind of guidelines are in places to protect areas of resource like watersheds, streams, irrigation systems, etc.? - will the team overseeing the EIS work with a cultural practitioner or historian? I am against renewing the lease as it stands, and I believe reform on the current lease is essential to protecting Hawai'i and our people. I have signed up for the email list. Thank you for your time and I look forward to seeing how this unfolds.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0022

Sandi Quinsaat <squinsaat@icloud.com> 6/6/2024 2:12 AM
US Navy Pacific Missile Range Facility and NASA Koke'e Park Geophysical Observatory Real Estate Environmental Impact Statement
To info@pmrf-kpgo-eis.com

Aloha mai,

For the record, my name is Sandra Puanani Quinsaat, I am 70 years old, born and raised here on Kaua`i and thankful I can still live here. I am of Kanaka/Filipino/Caucasian decent.

I received your correspondence referencing the above noted subject, mahalo for reaching out. I will not be able to attend your meetings and appreciate submitting my testimony in writing.

Your proposed action is needed as the existing agreement for the State lands you occupy are set to expire. For this I'm sure there will be negotiations with the State based on the outcome of the EIS. These facilities are currently in existence with significant justification in their practices and areas of potential affect established. I don't object to the continuance of your business as you are currently operating. Your transparency and collaboration within our Island communities are key. I do however, strongly object to further development of buildings and desecration of ground on the properties you currently occupy. Moreover, I object to any training practices that exercises munition artillery that will impact the land or marine life in anyway shape or form. I say this by learning from history's lessons. Government has used abused and walked away from all destruction by their hands. No more! Not here on Kaua`i or anywhere else in this State going forward. Why ruin what little we have left, we are not a continent, where do we go! We know of other South Pacific Islanders who now reside here in Hawaii because their island was destroyed by US Government and countless destruction already done here in our State. These events happened we know that, so why would we support any form of destruction to our lands.

The State of Hawaii has laws in place to protect the land and its resources, I Pray they understand their responsibility to the Native Hawaiian/Kanaka as appointed stewards for the the people and make decisions based on Hawaii Revised Status. With the lack thereof being Hawaiian Lands and Resources, Military presence here in Hawaii must be regulated. I further pray that all contracted agreements between PMRF and the State are done with the best interest of Kaua`i residents at heart.

Mahalo for your understanding of my testimony

Kind regards,

Sandra P. Quinsaat
Native Hawaiian Organization
Na Hui O Kaneiolouma
Board Member

State of Hawai`i
Kaua`i/Ni`ihau Island Burial Council
Commissioner/Chair

Scoping Comment Letter 0023

Consent for storing submitted data
True

First Name
Hanna

Last Name
Hodak

Add Me to the Project Mailing List
Yes

Street
744 Cedar St

City
Honolulu

State
HI

Zip code
96814

Email
hannasoccer16@icloud.com

Organization/Affiliation (if any)

Comments

The Pacific Missile Range Facility Barking Sands should not be in use or be furthered as it is harmful to local land, voices, and culture. There should be a Demilitarization to the parts of Hawai'i that can still be kept safe and culturally sound.

Add Attachments (optional)

Submitted on
06/06/2024

Scoping Comment Letter 0024

Jason Yotsuda <jkyotsuda@outlook.com>
Restricted use
To info@PMRF-KPGO-EIS.com

6/10/2024 3:18 PM

Hi,

I just wanted to put my 2 cents in about the continuation of PMRF using the area. In the past, we were allowed to access the beaches for fishing, but since 911 that has been taken away. The area is prime for fishing and beach going. I support PMRF, but not at the cost of restricted use of the beach area.

Mahalo,

Jason

Scoping Comment Letter 0025

Joshua K Hekekia <joshua.k.hekekia@hawaii.gov> 6/11/2024 2:35 PM

Re: DTS 202405131013NA - EISPN - PMRF-KPGO Real Estate Project

To Ferdinando, Lisa A CIV USN PMRF KEKAHA HI (USA) <lisa.a.ferdinando.civ@us.navy.mil> Copy info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com>

Thank you Lisa.

From: Ferdinando, Lisa A CIV USN PMRF KEKAHA HI (USA) <lisa.a.ferdinando.civ@us.navy.mil>
Sent: Tuesday, June 11, 2024 8:34 AM
To: Hekekia, Joshua K <joshua.k.hekekia@hawaii.gov>
Cc: info@PMRF-KPGO-EIS.com <info@PMRF-KPGO-EIS.com>
Subject: [EXTERNAL] FW: DTS 202405131013NA - EISPN - PMRF-KPGO Real Estate Project

Aloha Joshua,

Comments are being accepted at info@PMRF-KPGO-EIS.com. I forwarded them your comment and have cc-ed them here. You can send any future comments to them directly. Please let me know if you need any additional information. Thank you for your comment.

Very Respectfully,

Lisa Ferdinando
Public Affairs Officer
Pacific Missile Range Facility
☎ Work: 808.335.4740
☎ DSN: 315.422.4740
☎ Cell: 808.590.7653
✉ Direct: Lisa.A.Ferdinando.civ@us.navy.mil
✉ Office: PMRFPublicAffairs@us.navy.mil

From: Hekekia, Joshua K <joshua.k.hekekia@hawaii.gov>
Sent: Monday, June 10, 2024 10:11 PM
To: PMRF Public Affairs <PMRFPublicAffairs@us.navy.mil>
Subject: [Non-DoD Source] DTS 202405131013NA - EISPN - PMRF-KPGO Real Estate Project

Dear Ms. Wells,

Please see the attached response letter from our Director for the Environmental Impact Statement Preparation Notice (EISPN) for the Pacific Missile Range Facility and Kokee Park Geophysical Observatory (PMRF-KPGO) Real Estate Project.

If you have any questions or concerns, please feel free to contact me via the information listed below.

Thank you.

Joshua K. Hekekia
Office of Planning & Sustainable Development
Planner, Coastal Zone Management Program
235 S. Beretania Street, 6th Floor
Honolulu, Hawai'i 96813
Ph.: (808) 587-2845
Joshua.k.hekekia@hawai.gov

- image002.png (28 KB)
- image003.png (18 KB)

STATE OF HAWAIʻI
OFFICE OF PLANNING
& SUSTAINABLE DEVELOPMENT

JOSH GREEN, M.D.
GOVERNOR

SYLVIA LUKE
LT. GOVERNOR

MARY ALICE EVANS
DIRECTOR

235 South Beretania Street, 6th Floor, Honolulu, Hawaiʻi 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaiʻi 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: https://planning.hawaii.gov/

Coastal Zone Management Program

Environmental Review Program

Land Use Commission

Land Use Division

Special Plans Branch

State Transit-Oriented Development

Statewide Geographic Information System

Statewide Sustainability Program

DTS 202405131013NA

June 10, 2024

Ms. Kerry Wells
Project Manager
Naval Facilities Engineering Systems Command, Hawai'i
Environmental OPHEV2
400 Marshall Road, Building X-l 1
Pearl Harbor, Hawaiʻi 96860
Attn: PMRF and KPGO RE EIS

Subject: Environmental Impact Statement Preparation Notice, Proposed Pacific Missile Range Facility and Kokeʻe Park Geophysical Observatory Real Estate Project
Kekaha, West Kaua'i on the Island of Kaua'i,

Tax Map Key(s): (4)1-2-001:001, 006, & 010; (4)1-2-002:001, 010-013, 015, & 024-030; (4) 1-2-016:011; (4) 1-4-001:002, 013, 014, & 999 and (4) 2-1-003:018

Thank you for the opportunity to provide comments for the Environmental Impact Statement Preparation Notice (EISPN) on the Pacific Missile Range Facility and Kokeʻe Park Geophysical Observatory Real Estate Project. The notification request was received by our office via memo on May 13, 2024.

It is our understanding that this real estate study involves two federal agencies. The U.S. Navy (USN) proposes to retain the use of 8,348 acres of the subject parcel for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF). The National Aeronautic Space Administration (NASA) proposes to retain the use of 23 acres of the subject area in support of continued operations at Kōkeʻe Park Geophysical Observatory (KPGO).

Both federal agencies have agreements with the State of Hawaiʻi. The Department of Land and Natural Resources (DLNR) has the fiscal responsibility to manage these real estate agreements land leases which are set to expire between 2027 and 2030.

The Office of Planning and Sustainable Development (OPSD) has reviewed the submitted material and has the following comments to offer:

1. Issues of Programmatic Concern
   We acknowledge that the EISPN touches on issues that are of programmatic concern for OPSD and that will be addressed in the Draft Environmental Impact Statement (DEIS). These include State Land Use controls Hawai‘i Revised Statutes (HRS) Chapter 205 (State Land Use Laws); HRS Chapter 226 (the Hawai‘i State Planning Act); and as stated in Appendix B of the EISPN regulatory settings concerns that are related to the coastal environment such as Water Resources; Marine Biological Resources; and Geological Resources.

2. Coastal Zone Management Act (CZMA), Federal Consistency
   We note that Table 4-1, page 4-3 of the EISPN correctly identifies that this project may be subject to CZMA Federal Consistency based Title 15 Code of Federal Regulations (CFR) Part 930 Subpart C – Consistency for Federal Agencies. OPSD is the lead state agency with the authority to conduct CZMA federal consistency reviews. At your earliest convenience, please contact our office on the applicability of CZMA federal consistency.

3. Hawai‘i Coastal Zone Management (CZM) Program
   The CZM area is defined as “all lands of the State and the area extending seaward from the shoreline to the limit of the State’s police power and management authority, including the U.S. territorial sea” under HRS § 205A-1.

   Pursuant to HRS § 205A-4, in implementing the objectives of the CZM program, agencies shall consider ecological, cultural, historic, esthetic, recreational, scenic, open space values, coastal hazards, and economic development. As the determining agency is the DLNR Land Division, to assist in the decision-making process, the DEIS should include a discussion on the project’s consistency with the policies of the Hawai‘i CZM Program, HRS § 205A-2, as amended.

   Furthermore, the objectives and supporting policies of the Hawai‘i CZM Program serve as the foundation of the enforceable policies of the State of Hawai‘i. Disclosure of impacts on CZM objectives and supporting policies will aid the State in determining impacts to central O‘ahu surface water resources as well as evaluate needed mitigation measures.

For any questions regarding this comment letter, please contact Joshua Hekekia at (808) 587-2845 or by email to Joshua.K.Hekekia@hawaii.gov. If you wish to respond to this comment letter, please include DTS 202405131013NA in the subject line.

Sincerely,

Mary Alice Evans

Mary Alice Evans
Director

Scoping Comment Letter 0026

Consent for storing submitted data
True

First Name
Thomas

Last Name
Clements

Add Me to the Project Mailing List
Yes

Street
5725 Tapa St

City
Koloa

State
HI

Zip code
96756

Email
hrcpao@yahoo.com

Organization/Affiliation (if any)
Retired

Comments

I support Alternative 1 and recommend this as the preferred alternative. This alternative provides for the continued use of these lands with minimal costs to administer. Alternative 2 potentially causes the State of Hawaii to purchase these lands when no longer needed by PMRF, creating cost for the Federal government at the front, and State government at the other end. If not purchased back by the state at that time, the lands could potentially be purchased by private entities and used in non-compatible ways. I see compatibility as the key issue for West Kauai. Currently, Hawaii's top three industries successfully function together. Tourism craft cross the waters of the Range to Napali; agriculture benefits from the API lease that relieves the pressure of commercial development interests, and PMRF continues as the #3 employer -- offering high tech careers while serving as the largest multi-environment instrumented range. Compatible tourism and agriculture activities ensure the viability of this national asset. High density housing and commercial development in the API leased lands create encroachment concerns that limit the effectiveness of PMRF. Therefore, these leased lands should continue without adjustments to preserve compatibility and viability for Hawaii's leading industries.

Add Attachments (optional)

Submitted on
06/10/2024

Scoping Comment Letter 0027

Consent for storing submitted data
True

First Name
Susan

Last Name
Wiener

Add Me to the Project Mailing List
Yes

Street
Pu'u Rd

City
Kalaheo

State
HI

Zip code
96741

Email
energysavant@yahoo.com

Organization/Affiliation (if any)

Comments

Of the Action Alternatives, I definitely do NOT support Alternative 2 in which the Navy and NASA would purchase acreage on Kauai.

Add Attachments (optional)

Submitted on
06/10/2024

Scoping Comment Letter 0028

Consent for storing submitted data
True

First Name
Lisa

Last Name
Grandinetti

Add Me to the Project Mailing List
Yes

Street
2499 Kapiolani Blvd

City
Honolulu

State
HI

Zip code
96826

Email
lisanakagrand@gmail.com

Organization/Affiliation (if any)

Comments

Demilitarize the illegally occupied Kingdom of Hawaii!

Add Attachments (optional)

Submitted on
06/10/2024

Scoping Comment Letter 0029

Don Wilson <wilsond049@hawaii.rr.com> 6/11/2024 7:55 PM

EIS RE: PMRF & NASA at KoKE'E PARK, KAUAI, HI

To info@pmrf-kpgo-eis.com

To: Commanding Officer, Naval Facilities Engineering Systems Command, Hawaii

Subject: EIS concerning Koke'e Park, Makaha Ridge, Kauai

Please accept my comments, attached, as a former PMRF CO.

If you have any questions/concerns, I can be reached via my email, or (808) 465-1394, or residence, 1212 Punahou St., Apt. 3108, Honolulu, HI 96826.

Thank you for the opportunity to comment.

Very respectfully,

D. H. Wilson
CAPT, USN (Ret)

- Kokee EIS.docx (22 KB)

11 June 2024

To: NAVFACHI Environmental OPHEV2, Attn: PMRF and KPGO Re: EIS PM

Subj: Environmental Impact Statement re: Koke'e Park, Kauai

Ladies/Gentlemen,

Please accept my strong endorsement for US Navy, NASA, Hawaii Air National Guard, FAA, and varied communications assets to continue to use HI State Koke'e Park land, to the benefit of the United States, Hawaii State, and Kauai County.

In context, I am a former PMRF Commanding Officer, long since retired, and I have no personal or financial interest in this EIS. That said, given my professional knowledge of the facilities and operations located on the land, I believe these tenants should remain indefinitely – or until their use is no longer required.

The US Navy is but one tenant, and Koke'e affords the greatest radar range available, given the height of Makaha Ridge. Being able to "see" great distances from a stable, fixed point assures greater safety, precise tracking, and coordination with other sensors to enhance training, and test and evaluation events. Rescinding authorization to use Koke'e would adversely impact Department of Defense – and other - missions, writ large. There is no viable substitute for this site, and the navy's presence is not just benign; the navy is a very good steward of the land. Indeed, navy assets are so integral to the land, feral goats proliferate the property because they are protected – to the chagrin of local hunters who know they cannot access the land.

NASA, another tenant at Koke'e, values its assets at Koke'e, and often coordinates its efforts with the US Navy to either support complementary missions, or deconflict concurrent events. I don't speak for NASA, but I know of their efforts, and why they too treasure Koke'e's geographic position and altitude

While I do not speak for other federal or HI State agencies also using the Koke'e site, I'm confident they too would/will support continued access, for the same reasons. The FAA, for example, tracks flights into/out of DKI International Airport, as well as trans-Pacific flights originating either from the US Mainland going east to Asia, and flights from Asia to the US Mainland. FAA radars and communications networks are integral and invaluable assets for safe commercial flights.

The point remains: USN and other tenants at Koke'e are respectful of the land, the Hawaiian culture, and the contributions their assets bring to the state and nation. Operations conducted at Makaha Ridge do not adversely impact the park land per se, nor appurtenant lands.

Strongly recommend existing leases be perpetuated for the reasons stated.

D. H. Wilson, USN
CAPT, USN (Ret)

Scoping Comment Letter 0030

Hayden Hislop <haydenhislop@gmail.com> 6/12/2024 3:23 AM

Testimony Against Renewal of PMRF Land Lease

To info@pmrf-kpgo-eis.com

To whom it may concern,

I am writing to express my strong opposition to the renewal of the Pacific Missile Range Facility (PMRF) land lease on Kauai. The renewal process has lacked transparency, with inadequate advertising, leading many to believe that the Navy is deliberately avoiding public scrutiny. This lack of due diligence is concerning, especially given the lease terms of just $1 per year, which is far below market value. The state must demand fair market value or more for this land.

There are critical questions regarding the state's right to lease these lands. The base facilitates activities such as “test” bombing the ocean and minor outlying islands, causing significant ecological damage. The Navy must clarify which Native Hawaiian organizations they are consulting for the mandatory Section 106 Cultural Impact Assessment. Native Hawaiian rights to fish and hunt from the ocean to the mountain without needing identification must also be respected.

The land currently held by PMRF could be converted into farmland to feed Kauai. Currently, this area is not utilized for agriculture, primarily due to military control and environmental contamination from chemical sprays. These chemicals, including herbicides and other hazardous substances, pose a significant threat to the local environment and public health. The ecological devastation caused by PMRF includes the diversion of water on the Mānā Plain, which disrupts traditional cultural practices and the natural wetland ecosystem.

If PMRF were not there, restoring this wetland would involve reestablishing native plant species, reviving traditional taro farming (loʻi kalo), and improving habitat for local wildlife. Such restoration would enhance biodiversity and reconnect the native Hawaiian community with their cultural heritage and traditional land stewardship practices.

Additionally, the presence of PMRF has led to housing displacement for local residents, as military personnel occupy housing that could otherwise be available to Kauai's residents. This displacement exacerbates the housing crisis and impacts the social fabric of our community.

Finally, PMRF stands as a symbol of the illegal occupation of Hawaii, a painful reminder of historical injustices that continue to affect native Hawaiians. The facility is also used to train foreign military forces, such as the Israeli Defense Force, further alienating the local community and contradicting our values of peace and sovereignty.

For these reasons, I urge you to consider the long-term benefits of repurposing the PMRF land for agricultural use and ecological restoration. This decision would promote food security, environmental sustainability, cultural preservation, and social equity for the people of Kauai.
Thank you for your attention to this critical issue.

Sincerely,
Hayden Hislop

Scoping Comment Letter 0031

Michael Curtis <808randr@gmail.com> 6/13/2024 3:43 PM

6/4 meeting Lihue Vet Center

To info@pmrf-kpgo-eis.com

Attached are comments from scoping meeting.

First: No Movies??? used to have.

Aloha,
mike

Michael Curtis
c 808-639-7878, fax 888-370-2684
808RandR@gmail.com
from Poipu Beach, the Leading Edge of the Known Universe®

- PMRF comments.PDF (736 KB)

Public Scoping Meeting Comment Form

Date: 6/4/2024 Lihue Veteran

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

No MORE Movies???

Military testing + practices improve our US + Allies performance

Unique Test Facility – Very Valuable

Please provide your mailing address to receive future notifications about the project.

1. Name: Mike Curtis
2. Organization/Affiliation (if applicable): N/A
3. Mailing Address: EdSRandR@gMail.com

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

Please turn in this form at a public scoping meeting, submit online at PMRF-KPGO-EIS.com, send by email to info@PMRF-KPGO-EIS.com or mail to:

Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0032

Kamakana Ferreira <kamakanaf@oha.org> 6/13/2024 6:53 PM

OHA Comment Re: PMRF Real Estate Renewal EISPN

To info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com> Copy Hulu Lindsey <hulul@oha.org> • Dan Ahuna <dana@oha.org> • Dawn Chang (Guest) <dawn.chang@hawaii.gov>

Aloha,

Attached is an Office of Hawaiian Affairs (OHA) comment letter on the May 2024 Environmental Impact Statement Preparation Notice (EISPN) for the Pacific Missile Range (PMRF) and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate renewal in Waimea, Kauaʻi. Naval Facilities Engineering Systems Command has prepared this EISPN on behalf of the Department of the Navy (DON) and the National Aeronautics and Space Administration (NASA) in accordance with Hawaiʻi Revised Statutes (HRS) 343 and the National Environmental Protection Act (NEPA).

A hardcopy of the letter will be mailed out to you tomorrow. Please let me know if you have any questions.

Mahalo,

Kamakana C. Ferreira, M.A.

Lead Compliance Specialist

Office of Hawaiian Affairs

560 N. Nimitz Hwy

Honolulu, Hi. 96817

(808)594-0227

- 06.07.24_ OHA Comment on EISPN for PMRF Real Estate Renewal, Kauai.pdf (300 KB)

PHONE (808) 594-1888

FAX (808) 594-1938

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
560 N. NIMITZ HWY., SUITE 200
HONOLULU, HAWAI'I 96817

June 7, 2024

Kerry Wells
PMRF and KPGO EIS Project Manager
Naval Facilities Engineering Systems Command
400 Marshall Road, Building X-11
Pearl Harbor, Hawai'i 96860

Re: Environmental Impact Statement Preparation Notice (EISPN)
Pacific Missile Range Facility and Kōke'e Park Geophysical Real Estate EIS
Waimea Ahupua'a, Kona Moku, Kaua'i Mokupuni
Tax Map Key: (4) 1-2-002:001, 010, 011, 012, 013, 015, 024, 025, 026, 027, 028, 006; (4) 1-2-016:011; (4) 1-4-001:013, 999; (4) 1-2-002:029, 030; (4) 2-1-003:018; (4) 1-2-001:001, 010; (4) 1-4-001:002, 013, 014.

Aloha e Ms. Wells:

The Office of Hawaiian Affairs (OHA) is in receipt of the May 2024 Environmental Impact Statement Preparation Notice (EISPN) for the Pacific Missile Range (PMRF) and Kōke'e Park Geophysical Observatory (KPGO) Real Estate renewal in Waimea, Kaua'i. Naval Facilities Engineering Systems Command has prepared this EISPN on behalf of the Department of the Navy (DON) and the National Aeronautics and Space Administration (NASA) in accordance with Hawai'i Revised Statutes (HRS) 343 and the National Environmental Protection Act (NEPA). As existing real estate agreements are set to expire between 2027 and 2030, the DON is proposing to retain the use of 8,348 acres of State lands for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at PMRF. NASA also proposes to retain the use of their 23 acres of State lands in support of continued operations including measurements of the Earth's rotation and local land motion at KPGO.

The DON's current real estate agreements with the Department of Land and Natural Resources (DLNR) include 684 acres of leaseholds and 7,664 acres of easement lands, for a total of 8,348 acres. Current leases and easements are primarily used for passive encroachment buffers, as well as for mission readiness, access, and utilities at the following five general locations: Main Base, Kamokalā Ridge, Mānā Water Well, Miloli'i Ridge, and Mākaha Ridge. No ground-based training occurs on these parcels.

NASA's current real estate agreements with DLNR include 16 acres of leaseholds and 7 acres of easement lands, for a total of 23 acres. NASA issued the DON a Use Permit in 2016 for

portions of KPGO to conduct radar, telemetry, and communications services in support of PMRF operations. Additionally, the Navy and NASA conduct environmental management and stewardship activities on these lands.

The OHA is the constitutionally established body responsible for protecting and promoting the rights of Native Hawaiians.[1] OHA has substantive obligations to protect the cultural and natural resources of Hawai'i for its beneficiaries.[2] Accordingly, OHA is required to (1) serve as principal public agency in the State of Hawai'i responsible for the performance, development and coordination of programs and activities relating to native Hawaiians and Hawaiians; (2) assess the policies and practices of other agencies impacting native Hawaiians and Hawaiians; and (3) conduct advocacy efforts for native Hawaiians and Hawaiians.[3]

OHA provides the following comments pertaining historic preservation coordination, biological surveys, alternatives analysis and restoration component, ceded land trust considerations, and the recordation of comments:

Historic Preservation Coordination

The EISPN indicates that cultural resources will be identified for National Historic Preservation Act (NHPA) eligibility and HRS Chapter 6E significance. While it appears State and Federal level historic preservation compliance is required, there is no clear timeline for coordination of NHPA, HRS 6E, and NEPA compliance. It is further not clear how findings from NHPA and HRS 6E will be utilized in informing the NEPA document, especially in regards to the identification of adverse impacts to historic properties and cultural resources.

Fortunately, the Advisory Council on Historic Preservation (ACHP) and Council on Environmental Quality (CEQ) did issue a handbook[4] in March 2013 for assisting Federal agencies on integrating NEPA and Section 106 reviews. Notably, the handbook recommends coordinating the planning schedules for both NEPA and Section 106 processes as NHPA is needed to properly inform the NEPA document on possible impacts to historic properties. The handbook specifically states that,

> "an EA [environmental assessment] includes the Section 106 focus on which part of the proposed action could specifically affect a historic property and describes how the resource might be affected… To coordinate Section 106 and an EA, an agency would use the Section 106 adverse effect criteria in evaluating and describing effects on historic properties. Agencies may also find it helpful to relate adverse effects under Section 106 to criteria for determining the significance of impacts under NEPA... Any treatment and mitigation measures developed through the Section 106 process should be referenced in the EA and

[1] Haw. Const. Art. XII Sec. 5.
[2] See HRS § 10.
[3] HRS § 10-3.
[4] March 2013. *NEPA and NHPA: A Handbook for Integrating NEPA and Section 106.* Prepared by the Council on Environmental Quality Control, Executive Office of the President, and the ACHP.

documented in a MOA [memorandum of agreement] or PA [programmatic agreement] developed in consultation with consulting parties."

Thus, OHA recommends that the EIS have a clear timetable and explanation for NEPA and NHPA coordination, with enough time allotted for substantial completion of NHPA to effectively detail identified historic properties, impacts, and mitigations within the NEPA document.

While OHA does recognize that the State level processes for HRS 6E and 343 are separate, we have been supportive of the HRS 6E process being completed or at least initiated first to assist in properly informing the environmental review process. This is commensurate with Federal level guidance on NHPA. The intent of HRS Chapter 343 is to ensure a project's impact to the environment is fully considered in the planning process and to integrate mitigation where needed to minimize significant environmental harm. Surveys are conducted to identify various environmental components (i.e., flora, fauna, historic properties) so that any adverse impacts from the proposed action can be evaluated. In determining whether historic properties will be adversely impacted, the HRS 6E review process is essential to identifying historic sites and generating mitigation commitments in consultation with the State Historic Preservation Division (SHPD). Any identified sites and resulting mitigations made during the HRS 6E review process are typically included in the environmental review for an adverse impact analysis and public comment.

Hawai'i Administrative Rules (HAR) 11-200.1-18(d)(7) and (8) requires that impacts be identified and proposed mitigations be included within an environmental assessment. If HRS 6E is conducted after the HRS 343 process, impacts to historic and cultural resources cannot be fully identified as the statutory process to identify these environmental components is not yet completed. Furthermore, since mitigation for any adverse effects to historic properties and cultural resources are made as a result of consultation with SHPD through the HRS 6E process, proposed mitigations from this statutory process cannot be included in environmental review documents if HRS 6E is not completed first. OHA thus questions the completeness of any environmental review for projects that have not yet undergone HRS 6E review.

As one of the key pillars of HRS 343 is to allow for public comment on a proposed action, deferring the HRS 6E review process to take place after HRS 343 review could hide the presence of historic properties and cultural resources that are important to Native Hawaiians from our beneficiaries and the general public. As the opportunity to include possible adverse impacts and mitigations in an environmental review would be foreclosed, our beneficiaries would not be fully informed on the proposed action when environmental review documents are specifically provided for comment. Thus, OHA recommends that the draft EIS (DEIS) demonstrate HRS 6E compliance in a way that ensures historic properties are properly identified, and mitigation provided for any adverse impacts. Further, if not done so already, OHA encourages consultation with the SHPD as soon as practicable.

Biological Surveys

The EISPN does acknowledge that there are Endangered Species Act (ESA) species in the region, that include the Hawaiian hoary bat ('ope'ape'a), nēnē goose, pueo, Newell's shearwater, Hawaiian petrel, and the band-rumped storm petrel. In regards to rare state-recognized endemic forest birds, the EISPN mentions that the scarlet honeycreeper or 'i'iwi, 'apapane, and 'amakihi have been observed in the Kaunuohua Ridge. Five Federally listed plants were also noted in the Mākaha Ridge, that includes the Ni'ihau lobelia, makou, Hawai'i scaleseed, dwarf iliau, and the mā'oli'oli.

The EISPN states that potential impacts to biological resources will be evaluated. OHA recommends that any biological surveys done to determine the presence of any species must take into account seasonal considerations, be up-to-date, compare results with past surveys, and even obtain knowledge from cultural practitioners (with vast generational knowledge on cultural resources in the area). In regards to the latter, consultation with cultural practitioners could either be done directly or integrated with the cultural impact assessment (CIA).

If not done so already, OHA recommends early consultation with both the United States Fish & Wildlife Service (FWS) and the State of Hawai'i DLNR Division of Forestry and Wildlife (DOFAW). Both entities have vast knowledge regarding endangered and threatened species, and can offer guidance on Federal and State level compliance. DOFAW may perhaps have contacts with knowledgeable cultural practitioners as well to aid in producing the most accurate biological surveys.

Alternatives Analysis and Restoration Component

The EISPN currently details that 2 long-term alternatives and one no action alternative will be explored in the DEIS. It would appear that there is not much difference between Alternatives 1 and 2 except for Alternative 2 suggesting a fee simple acquisition of 700 acres of leasehold lands. There is no alternative proposing a shorter lease term. OHA argues that a meaningful analysis of a shorter-term lease option should be included in the DEIS as constant renewal of a long-term lease creates the appearance of *de facto* ownership.

As you are likely aware, the public's trust in the military has been shaken with recent events like the diesel fuel spill atop Haleakalā and the Red Hill fuel leak on O'ahu. Thus, there is a greater level of public awareness and concern regarding the military's actions and their ability to be good stewards of the land. This is especially true for military operations on State lands. As such, the military must strive to build back public trust and confidence by perhaps undertaking projects that are smaller in scope and easier to manage. Such projects could further include robust restoration components to properly demonstrate that the military can effectively restore lands after they are used for military operations. Currently, the EISPN seems to suggest the possibility that if leases aren't renewed, that the DON might abandon infrastructure in place. This is unacceptable and further serves to create a liability for the State. For this reason, OHA recommends a more moderate (short-term lease) alternative option that can still accomplish bare minimum mission requirements

for the military. But, perhaps more importantly, all alternatives should include a robust restoration component that shows how lands can be restored post military use, especially for lands owned by the State.

Ceded Land and Conservation District Considerations

The EISPN mentions that land leased and in easement by the DON and NASA are classified as conservation or agricultural district lands. OHA notes that these State lands are also "ceded" lands as described in Section 5 of the Admissions Act. In regards to OHA's own trust responsibilities, we have a vested interest in ceded lands that are part of the public land trust. Per the State of Hawai'i Constitution, Article XII, Sections 5 and 6, the OHA trustees exercise their power "to manage and administer the proceeds from the sale or other disposition of the lands, natural resources, minerals, and income derived from whatever sources for native Hawaiians and Hawaiian, including all income and proceeds from that pro rata portion of the trust referred to in section 4 of this article for native Hawaiians..."[5]. Affirmation of OHA's public trust duties are further captured in Hawai'i Revised Statutes (HRS) Chapter 10 to assess the practices of other agencies and advocate where necessary to make recommendations that limit or eliminate potential irrevocable harm to cultural resources and the public land trust. As such, OHA must be consulted as part of the lease renewal process and included in discussions with the DLNR. We advise that the DEIS include direct mention of this process.

As the DON and NASA have utilized these State parcels for decades, it is unclear if the State has been actively conducting periodic monitoring and site visits of these lease areas as an essential component of the State's duty to protect and preserve trust land is an obligation to reasonably monitor a third party's use of the property. To hold otherwise would permit the State to ignore the risk of impending damage to the land, leaving trust beneficiaries powerless to prevent irreparable harm before it occurs. Unless the condition of these lands is independently determined by the State, the State should arguably not entertain a process seeking renewal. Ignoring this obligation would show a disregard for the State's trust responsibilities. Procedurally, the DEIS should address any possible concerns noted by the State via an independent inspection or if an inspection is pending, detail the timeline for such inspections and subsequent report disclosures; in turn, the public would be allowed to comment via the HRS 343 process on how these deficiencies are being corrected or not.

As you are likely aware, the military use of State lands at the Pōhakuloa Training Area (PTA), on Hawai'i Island, was challenged in court recently (see Ching v Case). In 2019, the court ordered the State of Hawai'i DLNR to prepare a management plan that must include provisions for periodic monitoring of these lands as to ensure fulfillment of State trust responsibilities. OHA would assume that provisions for the State to independently conduct periodic monitoring and site visits at PTA would apply to other State lands leased by the military.

[5] See State of Hawai'i Constitution, Article XII, Sections 5 and 6.

In regards to conservation district use, OHA recommends that consultation with DLNR's Office of Conservation and Coastal Lands (OCCL) should already be occurring to determine what types of compliance actions are necessary to enable military utility use. This should be fully discussed in the DEIS. Arguably, it is unclear how military use is consistent with conservation district zoning uses.

Recordation of Comments

HAR 11-200.1-24(s)(1) states that a DEIS shall include "reproductions of all written comments submitted during the consultation period required in section 11-200.1-23." Typically, state level DEIS's or DEA's will provide copies of all written comments as they were originally received. OHA believes that while some agencies sometimes opt to recreate or summarize comments in their own formats, the intent of the rules is to include actual copies to demonstrate that comments were unaltered and applicable to the public scoping or early consultation process for HRS 343 compliance. As such, please include unaltered copies of any written comments received as part of public scoping meetings or in response to the EISPN.

Closing Remarks

Mahalo for the opportunity to comment. OHA looks forward to seeing our comments taken into consideration as the DEIS is being prepared. Should you have any questions, please contact OHA's Lead Compliance Specialist, Kamakana C. Ferreira at (808) 594-0227 or by email at kamakanaf@oha.org.

'O wau iho nō me ka 'oia 'i'o,

Stacy Ferreira

Stacy Ferreira
Ka Pouhana, Chief Executive Officer

SF:kf

CC: Carmen Hulu Lindsey, Ke Kauhuhu, Chair, OHA Board of Trustees
Dan Ahuna, Ke Kua 'O Kaua'i, OHA Trustee for Kaua'i
Dawn Chang, Chairperson, Board of Land and Natural Resources

Scoping Comment Letter 0033

Dayna K Vierra <dayna.k.vierra@hawaii.gov> 6/14/2024 3:31 PM

PMRF-KPGO EISPN DLNR-Land Division Comment Letter

To info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com> Copy Timothy Chee <timothy.chee@hawaii.gov> • Lauren E Yasaka <lauren.e.yasaka@hawaii.gov> • Ian C Hirokawa <ian.c.hirokawa@hawaii.gov> • Kevin E Moore <kevin.e.moore@hawaii.gov> • Russell Y Tsuji <russell.y.tsuji@hawaii.gov>

Good Morning,

Please find the PMRF-KPGO EISPN comment letter for DLNR-Land Division attached.

If you have any questions, please let me know.

Thank you,

Dayna Vierra, Planner
Department of Land and Natural Resources, Land Division
1151 Punchbowl Street, Room 220
Honolulu, HI 96813
Tel: (808) 587-0423
Fax: (808) 312-6357
Email: dayna.k.vierra@hawaii.gov

- 061224 LD Comment Letter PMRF KPGO EISPN.FINAL - signed.pdf (282 KB)

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

DAWN N. S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA 'OIHANA KUMUWAIWAI 'ĀINA
LAND DIVISION

P.O. BOX 621
HONOLULU, HAWAII 96809

June 14, 2024

Mrs. Michele Lefebvre
Stantec GS Inc.
737 Bishop Street, Suite 3050
Honolulu, HI 96813
Sent via E-mail: info@PMRF-KPGO-EIS.com

Dear Mrs. Michele Lefebvre

SUBJECT: Comments on the Environmental Impact Statement Preparation Notice for the Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate, Island of Kaua'i.
Tax Map Keys (TMKs): (4) 1-2-001:001, 006, 010; (4) 1-2-002:001, 010, 011, 012, 013, 015, 024, 025, 026, 027, 028, 029, 030; (4) 1-2-016:011; (4) 1-4-001:002, 013, 014, 999; (4) 2-1-003:018.

Thank you for the opportunity to review and comment on the subject Environmental Impact Statement Preparation Notice (EISPN). The Land Division offers the following comments:

1. Section 1.1 (Project Introduction and Overview), first paragraph, includes a statement that the Draft Environmental Impact Statement (EIS) is being prepared "*in coordination with the Hawai'i Department of Land and Natural Resources*". The Department of Land and Natural Resources (DLNR) emphasizes that it is not assisting the Navy with the preparation of their Draft EIS. As the accepting authority, Staff is available for questions regarding the EIS process and DLNR will provide comments on the EIS during the official public comment period(s).

2. Section 1.1, page 1-3, paragraph 2, states: "*As requested by and in coordination with DLNR, the Navy and NASA identified that an EIS is the appropriate level of environmental review for the Proposed Action…*" The DLNR would like the Draft EIS to clarify that the DLNR did not make the initial determination. The Navy proposed the preparation of an EIS and the DLNR concurred with the decision. Further, we note that the referenced email is in regard to our initial review of the EISPN for compliance with Hawai'i Administrative Rules (HAR) Chapter 11-200.1 prior to the publication of the EISPN in Environmental Review Program's (ERP's) *The Environmental Notice* and does not pertain to the DLNR making any determination regarding the need for an EIS.

3. Section 1.1, page 1-3, paragraph 4, states that: *"For this Proposed Action, DLNR is responsible for issuing leases and easements to the NAVY and NASA. DLNR is the agency with the responsibility for approving the real estate action since the State lands*

are under the management of DLNR's Land Division. DLNR is required to conduct an environmental review of this Proposed Action."

We wish to clarify that while the DLNR, Land Division is responsible for processing land dispositions, it is ultimately the Board of Land and Natural Resources' (BLNR's) decision to approve or deny any such land disposition actions.

4. In the forthcoming Draft EIS, please describe the type of "surveillance and tracking" that occurs at Kōke'e Park Geophysical Observatory (KPGO), as indicated in Section 1.2 (Project Area). Also, please clarify what is being surveilled and tracked as well as the purpose of the backup power generation.

5. Section 1.3.3 (Navy Mission at PMRF) states that: *"The Navy conducts missile systems tests and has supporting facilities to track and evaluate these tests from the ocean floor to the outer atmosphere."* Please include in the Draft EIS, what is involved in the missile systems tests and how it affects the water, land, and air, etc. Please also clarify what are the *"supporting facilities"* that track and evaluate the tests.

6. Section 1.3.3 also mentions that testing occurs on the "ocean floor." Staff notes that the original lease contains an ocean right of way lease for 7,680 acres, but the current Proposed Action does not include those lands. Please explain in the Draft EIS why these submerged lands are no longer included.

7. Section 1.3.5 (Navy and NASA Use of State Lands) makes reference to a Figure 1-4, however, it would appear that the figure and what is supposedly being described in Appendix D do not coincide. Please revise the figure to show the applicable leaseholds and easements as described in Appendix D.

8. While we appreciate Table 2-1 (Section 2.2 Alternative Screening Process) and the descriptions given for each alternative, we believe that Alternative 1 and Alternative 2 are essentially the same action as the only difference is the land tenure mechanism (lease versus fee). While we agree that there may be different impacts given the land tenure mechanism, the DLNR would appreciate it if the Navy and NASA would analyze an additional alternative that would consider a modified Proposed Action.

9. In Section 2.3.1 (Alternative 1: Succeeding Current Real Estate Agreements), it states that *"the Navy and NASA would continue to adhere to applicable federal and state laws as well as policies and regulations applicable to Navy and NASA regarding investigation, removal, and cleanup of hazardous and toxic materials and wastes"*. In the Draft EIS, please include a discussion on the environmental impacts of removal and cleanup of hazardous and toxic materials and wastes.

10. Regarding Table 2-6, please provide the status of any surveys or programs that are supposedly implemented as a part of the Best Management Practices (BMPs) and/or management strategies as well as how often reoccurring surveys or consultation take place.

11. The 2nd paragraph in Section 3 (Project Setting) appears to either reference two separate documents or a later version of the same document. It states that the impacts to airspace, marine navigation, and marine resources from existing training and testing will be in the *Hawai'i-Southern California Training and Testing Final EIS/OEIS*. Any

additional analysis of future at-sea training and testing will be found in the proposed *Hawai'i-Southern California Training and Testing Final EIS/OEIS*. Please clarify this in the Draft EIS.

12. In Section 3.1 (Archaeological and Historic Resources), please be sure to include any findings regarding 'iwi kūpuna when doing archaeological surveys.

13. In Section 3.2 (Cultural Resources), there is mention of past and present cultural practices that have been identified through prior consultation with Native Hawaiian organizations and other stakeholders. In the Draft EIS, please include the names of those that have already been consulted with as well as those who have been consulted specifically in regard to the Cultural Impact Assessment (CIA) and their lineal ties to the project area. In addition, the DLNR requests that the Navy and NASA consult with the State Aha Moku.

14. In Section 3.3 (Biological Resources) of the Draft EIS, please define the area of interest.

15. Based on the description of Figure 3.3-1 in Section 3.3, 2nd paragraph, the figure should also include the noted interconnected system of irrigation ditches.

16. Regarding Section 3.6 (Environmental Justice), in the Draft EIS, please provide some examples of the demographic and socioeconomic indicators that will identify potentially disadvantaged communities.

17. In Section 3.7 (Water Resources) of the Draft EIS, please include a discussion on the methodology of how potential impacts to water resources were evaluated.

18. In Section 3.8 (Utilities), please identify (location and ownership) the "*existing wells*" that serve Kamokalā Ridge, Mākaha Ridge, and KPGO.

19. In Section 3.9 (Public Health and Safety) please provide the following:

    - Paragraph 3 mentions establishment of Ground Hazard Areas (GHAs) and Launch Hazard Areas over water. Please clarify if and/or how this is related to the ocean right of way lease that was mentioned in our earlier comment.

    - Paragraph 5 mentions safety procedures to prevent unintentional or unauthorized detonation of ordnance. Please include a description of these procedures in the Draft EIS.

    - Paragraph 6 talks about the transportation and handling of ammunitions, explosives, and hazardous materials. It further mentions that all ordnance is transported in compliance with PMRF Instruction 8023.G and U.S. Department of Transportation regulations. Please provide these documents or a discussion regarding these rules and regulations.

20. Please note that on Page 3-14, Section 3.10.1 (Air Quality), all the other elements listed in the first paragraph have their abbreviated symbol except lead (Pb).

21. In Section 3.12 (Hazardous Materials and Wastes), it mentions that used oil is taken to the Main Base to be recycled. In the Draft EIS, please provide the procedures followed

in the event of an oil spill during transport. Also, please provide a copy or access to the various hazardous materials management plans that are mentioned in this section.

22. Non-common words or actions - There are several instances in the document where there is use of potentially non-common words or actions. It would be appreciated if you were to include either definitions of the words or explanations of the actions. For example, in Section 1.1 the term "local land motion" is used. A definition or explanation on what local land motion is would be beneficial. Also, in Section 1.2, there is mention that Miloli'i Ridge is used for radar and telemetry activities. It would be helpful if there was an explanation of what telemetry activities are.

23. Acronyms - The acronyms for Office of Planning and Sustainable Development (OPSD) and the Space Exploration Network Services and Evolution (SENSE), are not included in the main document and on the Abbreviations and Acronyms page (vii). A further review of the document may be warranted to check if there are other omissions.

24. Hawaiian Diacritical Markings – In Section 1.3.1, the Hawaiian diacritical mark (the kahako) is missing from the word Kalākaua. A further review of the document may be warranted to check if there are other omissions.

Should you have any questions or concerns regarding this correspondence, please contact Dayna Vierra of the Land Division at (808) 587-0423.

Sincerely,

Russell Tsuji

Russell Y. Tsuji, Administrator
Land Division

Scoping Comment Letter 0034

Kendall L Tucker <kendall.l.tucker@hawaii.gov> 6/14/2024 3:55 PM

Notice of Intent To Prepare an Environmental Impact Statement for Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate

To info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com>

Aloha,

Attached you will find the State of Hawaii Division of Aquatic Resources (DAR) comments on the intent to prepare and EIS for the Pacific Missile Range Facility and Kokee Park Geophysical observatory. Please let me know if you have any problems with the document, or if there are any additional questions we can answer. Thank you

Kendall

Kendall (Tejchma)Tucker
Aquatic Biologist-Permits and Environmental Reviews
DLNR-Division of Aquatic Resources
1151 Punchbowl St. Rm 330 Honolulu, HI 96813
Kendall.l.tucker@hawaii.gov | 231-670-7719 cell |

- AR6675 comments (part 1) - signed.pdf (424 KB)

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAI'I | KA MOKU'ĀINA 'O HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET, ROOM 330
HONOLULU, HAWAII 96813

Date: 6-12-24
DAR # AR6675

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RYAN K.P. KANAKA'OLE
FIRST DEPUTY

DEAN D. UYENO
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION BUREAU
OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

MEMORANDUM

TO: Brian J. Neilson
DAR Administrator

FROM: Heather Ylitalo-Ward, Aquatic Biologist

SUBJECT: Notice of Intent To Prepare an Environmental Impact Statement for Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate

Request Submitted by: Department of the Navy, Department of Defense, National Aeronautic

Location of Project: 8,348 acres of State lands on Kauai, Hawaii

Brief Description of Project:

Pursuant to the National Environmental Policy Act (NEPA) of 1969 and regulations implemented by the Council on Environmental Quality, the Department of the Navy (DON) and National Aeronautics and Space Administration (NASA), the DON and NASA announce their intent to prepare an Environmental Impact Statement (EIS) to evaluate the potential environmental effects associated with the continued long-term DoD use of 8,348 acres of State lands on Kauai, Hawaii for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF), and the continued long-term NASA use of 23 acres of State lands on Kaua'i, Hawaii in support of continued operations (including measurements of the

Comments:

☐ No Comments ☒ Comments Attached

Thank you for providing DAR the opportunity to review and comment on the proposed project. Should there be any changes to the project plan, DAR requests the opportunity to review and comment on those changes.

Comments Approved: _____ Date: Jun 14, 2024

Brian J. Neilson
DAR Administrator

DAR# AR6675

Brief Description of Project

Earth's rotation and local land motion) at Kōke'e Park Geophysical Observatory (KPGO).

DAR# AR6675

Comments

Thank you for providing DAR with the opportunity to comment. During the EIS process, DAR would like to request that all streams, waterways, and ocean resources be delineated in the map of the proposed area. Any potential impacts should be discussed, any threatened and endangered species that can be found in the area should be identified, and mitigation measures should be proposed, as is typical of an EIS. DAR looks forward to reviewing the EIS after it is prepared.

Scoping Comment Letter 0035

linda oshiro <lindaoshiro555@gmail.com> 6/16/2024 2:02 AM

PUBLIC SCOPING MEETINGS

To info@pmrf-kpgo-eis.com Copy info@kakuaicamber.org

I was not able to attend the Kekaha meeting due to conflicting obligations.
I have lived in Hawaii 54 years, with the last 10 years next to the ocean in Kekaha. Your military activities, your electromagnetic surveillance of the coast, affects my personal energy field with excess stimulating energy that makes sleep difficult. It was proved your use of sonar affected the dolphins and whales. You seem not to care what your microwave radar towers or electromagnetic surveillance does to the human population
I am aware of the harm created by your activities and the target you have made of us and what a large landowner you have become and i am not happy with your presence
Linda Oshiro

Scoping Comment Letter 0036

Melissa Nash <melissasuenash@gmail.com> 6/16/2024 1:13 PM

PMRF EIS

To info@pmrf-kpgo-eis.com

Aloha,

My name is Melissa Nash, I am a resident of Kauai where my family homesteads in Moloa'a and teach island keiki and visiting families about beekeeping. We love the Aina and her creatures and are very concerned with the PMRF leasing the land within their own lease to big ag companies who grow GMO crops and spray harmful pesticides in large experimental quantities. This poison goes into the land, the water and touches everything in its path.

We would like to see the water on the west side restored to pre-plantation, natural routes, diversions removed and the land healed by Native Hawaiians. We would like to see this land used not for big ag to experiment, but to house local families who want to live close to the land and help heal it. We would like to see hemp grown, which can remediate the soil so it's safe for families to grow and live here.

We don't need big ag to lease and poison the land. But we do need places for local Hawaiian families to cultivate so they don't have to leave the island in the ever growing housing crisis.

Please stop working with the big ag corporations.

Sincerely,
Melissa Nash & family

Scoping Comment Letter 0037

Kauai Climate Action Coalition <kauaiclimate@gmail.com> 6/16/2024 9:05 PM

Input into EIS Scoping Process

To info@pmrf-kpgo-eis.com

Please see the attached comments from Kauai Climate Action Coalition (KCAC). Manalo,

Helen Cox, Chair

- KCAC Input to PMRF (5) (1).pdf (135 KB)

Kauai Climate Action Coalition
4266 Kalaheo Drive,
Kalaheo, HI 96741

Thank you for the notice of the Pacific Range Missile Facility (PMRF) and the Kōke‘e Park Geophysical Observatory (KPGO) Environmental Impact Statement (EIS) scoping process.

Kaua'i Climate Action Coalition is an island wide organization with more than 165 members whose mission is to work collaboratively to educate, advocate and take direct action to address the climate crisis. We welcome the opportunity to provide input.

We are sure you are aware that the US military is one of the world's largest greenhouse gas polluters, and we appreciate all efforts to mitigate this enormous problem. However, input to the scoping of the EIS is made difficult because the public has no information regarding the full scope of PMRF activities. Our comments below, therefore, are made from a limited understanding of PMRF’s current activities and their impacts.

1. Conduct an environmental assessment of its natural lands and those adjacent to it and compare the findings to the last EIS. Have the coastal lands, near shore environments, and wetlands been enhanced or degraded? Have endangered species increased or decreased from the last EIS? How will negative effects be mitigated?

2. Assess emissions from all sources at PMRF and report those transparently.

3. Analyze and mitigate the pollutants produced at PMRF. The missiles, the diesel trucks, the tow motors, the aircraft, the commuter cars, the laundry equipment, the electricity used, etc. etc. If there are secret military test projects that pollute, they should be looked at and mitigated confidentially. Please tell us if there is laser and electromagnetic research there, because of the massive expenditure of electricity that is used. Please include the submarine and drone boat emissions also. What will be done to mitigate these impacts?

4. We are aware that PMRF biologists removed healthy Kiawe forests. Consider a native lowland forest restoration project that would both remediate the soil and capture at least some of the massive amount of CO2 emitted by PMRF?

5. The land around PMRF was formerly agricultural, much of it still in agriculture. What are the Navy's intentions and what are the impacts?

6. Assess the impacts climate change will have on PMRF and how these will be mitigated. Impacts will include sea level rise, increased wildfires, water issues, and heat, among others.

7. Inspect and possibly remove or replace the fuel storage tanks at PMRF since they are the same generation as those at Red Hill. Findings should be shared with the public.

8. Explore how PMRF can partner with local organizations to increase the sustainability and resilience of the island.

9. Consider whether PMRF needs all the land it currently holds and reduce the land holdings in the lease if possible.

Submitted by Helen A Cox, Chair, Kaua'iClimate Action Coalition
kauaiclimate@gmail.com

Scoping Comment Letter 0038

Bonnie Bee <recallbherenow@hotmail.com> 6/16/2024 10:17 PM

PROPOSAL of proposed real estate agreements with the state of Hawaii of 8,348-acres at Koke`e, Kaua`i of the Crown Lands ▪ Draft EIS ▪ ▪ U.S. Navy: PMRF / NASA: KPGO

To dlnr.land@hawaii.gov Copy info@PMRF-KPGO-EIS.com <info@pmrf-kpgo-eis.com> • Jim Albertini <jimalbertini@gmail.com>

---

17 June 2024

PO Box 30848
Anahola HAWAI`I 96703-0848

ATTENTION Russell Tsuji
Department of Land and Natural Resources
(*DLNR*)
State of Hawaii
1151 Punchbowl Street - Room 220
Honolulu, HAWAI`I 96813

ATTENTION Kerry Wells, Project Manager
RE EIS PMRF and KPGO

Naval Facilities Engineering Systems Command, Hawaii, Environmental OPHEV2
400 Marshall Road, Building X-11
Pearl Harbor, HAWAI`I 96860

RE Proposed draft Environmental Impact Statement (***dEIS)*** ■ U.S. Navy Missile Range Facility and Geophysical Observatory Real Estate Environmental Impact Statement

To: Whom It May Concern :
DLNR state of Hawaii AND U.S. Navy / *PMRF* **AND** National Aeronautics and Space Administration (NASA)

NO ACTION - We adamantly agree:

~ NO ACTION ~

"***NO***" to **ALL** proposed real estate agreements with the state of Hawaii for the Pacific Missile Range Facility (PMRF) and the Koke`e Park Geophysical Observatory (*KPGO)*

- *NO* continuance of long-term lease of the Department of Defense use of the 8,348-acres of Crown Lands - The Ceded Land Trust Koke`e, Kaua`i
- **NO** to the *SPECIFIED* 410 acres, which the U.S. Navy PMRF
- **NO** to NASA proposal of continuance of the leasing ***AND*** long-term use of the 23-acres of Crown Lands - The Ceded Land Trust Koke`e, Kaua`i - of named: NASA Koke`e Park Geophysical (KPGO)

ABSOLUTELY `A`ole

NO to the proposed action: in the
PMRF-KPGO in the draft Environmental Impact Statement (dEIS)

We look forward to acknowledgement of Our participation and implementation of
NO ACTION ALTERNATIVE
...

Please keep Us abreast of any/all updates in the dEIS scoping process via U.S.Postal Service (USPS) - regarding Our comments - of the draft Environmental Impact Statement scoping process

ALOHA `ĀINA

MAHALO Loa

Sincere ALOHA,

Bonnie P Bator `Ohana
(Keana`aina, Keli`ikoa, Kai`aokamalie & Kai)

- Screenshot_20240508_162158_Drive_1715272447253_1715272613837_1715272741390_1715273701289_1715406.jpg (94 KB)

Approving Agency / Accepting Authority	State of Hawai'i, Department of Land and Natural Resources Russell Tsuji, (808) 587-0419, dlnr.land@hawaii.gov 1151 Punchbowl Street, Room 220, Honolulu, HI 96813

Scoping Comment Letter 0039

Louise Sausen <tutumamasau@gmail.com> 6/17/2024 2:54 PM

To info@pmrf-kpgo-eis.com

I oppose Navy acquisition of 8,000 acres of CROWN LANDS 🔥 😡 🔥 Especially when Kanaka are being PRICED OUT OF OUR ONE HANAU 🔥 😡 🔥 Keep Hawaiian lands for Hawaiian people 🌺 🌟 💞 🌟 🌺

Scoping Comment Letter 0040

Regina Gregory <reginagregory24@gmail.com> 6/17/2024 2:59 PM

comment

To info@pmrf-kpgo-eis.com

Scoping comments, PMRF

1. Linking to the NASA Observatory seems like another military land grab. Instead, you should include your environmental impacts on Ni'ihau, Kwajalein, the 1,100-square-mile instrumented underwater range, and the broader ocean impact area.

2. Excluding people from the land is a major impact. A nearly 8,000-acre "buffer zone" is excessive and could be reduced. Your assessment should also include options to retain less land, e.g., omit Kamokalā Ridge, the Mānā Water Well, Miloli'i Ridge, and/or Makaha Ridge.

3. The Hawai'i Supreme Court has already ruled that leasing public lands to the US military is not in keeping with DLNR's duty to safeguard that land. It also runs counter to the "reconciliation" called for in Public Law 150-103. The sale of public lands is strongly discouraged by law. In fact, the entire US military presence in Hawai'i rests on a shaky foundation of illegal occupation.

4. The "no action" alternative is clearly preferable environmentally. Under this option, the Navy should not be allowed to simply abandon it, but be required to clean it up. That will create a lot of jobs!

5. Leading STEM students into military careers should not be considered a benefit. It takes them away from more useful endeavors like renewable energy, water management, and other forms of progress toward sustainability instead of destruction.

6. Economic impacts should include not only income from DoD, but also loss from alternative uses of the land.

Regina Gregory

Scoping Comment Letter 0041

Gordon, Laney (she/her/hers) <gordon.laney@epa.gov> 6/17/2024 3:06 PM

EPA Comments on Notice of EIS for PMRF KPGO

To info@pmrf-kpgo-eis.com Copy Shari.A.Miller@nasa.gov <shari.a.miller@nasa.gov>

Hello,

Please see EPA's attached scoping comments on the PMRF KPGO project above. Thank you for the opportunity to review this document. Feel free to contact me if you have any questions regarding the comments.

Sincerely,

Laney Gordon

Laney Gordon (she/her)

Life Scientist & NEPA Reviewer

Envrionmental Review Section

U.S. Environmental Protection Agency, Region 9

75 Hawthorne Street (CED-2-1)

San Francisco, CA 94105

(415) 972-3562 | gordon.laney@epa.gov

- 2024-06-17_EPA Scoping-PMRF+KPGO NOI_Kauai-DoD-NASA-signed.pdf (486 KB)

REGION 9
SAN FRANCISCO, CA 94105

June 17, 2024

Ms. Kerry Wells
Project Manager
Naval Facilities Engineering Systems Command
400 Marshall Road
Pearl Harbor, Hawai'i 96860

Subject: EPA Scoping Comments for the Notice of Intent to Prepare a Draft Environmental Impact Statement for the Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Agreement, Kauai, Hawaii

Dear Kerry Wells:

The U.S. Environmental Protection Agency has reviewed the above-referenced document. We are providing comments pursuant to the National Environmental Policy Act, Council on Environmental Quality regulations (40 CFR Parts 1500-1508), and our NEPA review authority under Section 309 of the Clean Air Act. The CAA Section 309 role is unique to the EPA. It requires EPA to review and comment publicly on any proposed federal action subject to NEPA's environmental impact statement requirement.

The U.S. Navy and the National Aeronautics and Space Administration (NASA) intend to prepare a Draft Environmental Impact Statement (DEIS) to evaluate the potential environmental impacts of the proposed real estate agreements with the State of Hawai'i for the Pacific Missile Range Facility (PMRF) and the Kōke'e Park Geophysical Observatory (KPGO) project. The Department of Defense utilizes 8,348 acres of State lands on Kaua'i for operational continuity and sustainment of the PMRF, including military training, testing, and facility operations. The continued long-term NASA use of 23 acres of State lands is in support of continued KPGO operations, including measurements of the Earth's rotation and local land motion.

Review Summary

The Preparation Notice of the DEIS is primarily a disclosure document for a real estate action to be negotiated with the State of Hawai'i. As such, EPA did not identify significant public health, welfare, or environmental quality concerns to be addressed in the Draft EIS. For your consideration, we have recommendations regarding environmental justice and climate change, to enhance disclosure and further distinguish impacts in and around the project area. Please see the attached detailed comments.

The EPA Appreciates the opportunity to review this NOI for the Draft EIS for the Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory. If you have any questions, please contact me at (213) 244-1834 or contact Laney Gordon, the lead reviewer for this project, at (415) 972-3562 or gordon.laney@epa.gov.

Sincerely,

FRANCISCO DONEZ

Digitally signed by FRANCISCO DONEZ
Date: 2024.06.17 10:33:09 -07'00'

Francisco Dóñez
Acting Manager
Environmental Review Section 2

Enclosures: EPA's Detailed Comments

cc: Shari Miller
National Aeronautics and Space Administration

Environmental Justice

We appreciate the discussion in the Preparation Notice of the Draft EIS regarding the history of land tenure in Hawai'i, documented in the Land Use section and Appendix A. There are continuing effects from this history that weigh on members of the Native Hawai'ian community, expressed through comments during scoping, that are not captured in the document. These remarks were reiterated during public meetings for the project on June 4, 2024; some of the public's concerns were also reported in the *Kauai Now News* on June 9, 2024.[1] These comments reference Native Hawai'ians' cultural attachment to the land, and stress that their native lands were wrongly taken. The comments specifically cite the $1.00 fee paid by the Army in 1964 for the 65-year lease as an example of inequity.

Recent Executive Orders direct the entire Federal Government to advance equity and racial justice for underserved communities, including Native Hawaiian/Pacific Islander communities. Executive Order 13985: *Advancing Racial Equity and Support for Underserved Communities Through the Federal Government* (January 20, 2021) directs federal agencies to evaluate whether their policies produce racially inequitable results when implemented, and to make the necessary changes to ensure underserved communities are properly supported. Executive Order 14031: *Advancing Equity, Justice, and Opportunity for Asian Americans, Native Hawaiians, and Pacific Islanders* (May 28, 2021) seeks to eliminate barriers to equity and justice for these populations. We also note that the Department of Defense's Equity Action Plan, pursuant to EO 13985, includes a strategy "to advance equity and rectify past harms" resulting from environmental and other impacts from defense activities on ancestral lands.[2] These directives should be considered in the context of the project, to help guide decision-making.

Additionally, the guidance document *Promising Practices for EJ Methodologies in NEPA Reviews*[3] may be helpful to consult when determining how non-chemical stressors (e.g., chronic stress related to environmental or socio-economic impacts) amplify impacts. As stated in that document, "The cumulative ecological, aesthetic, *historic* (emphasis added), cultural, economic, social, or health effects of a proposed action can arise from and also include non-chemical stressors" (p. 32).

Recommendations: In the Draft EIS, consider how the permanent loss of State land through fee simple retention differs from retention through non-permanent mechanisms such as leases, etc., and discuss impacts related to these land retention mechanisms. Consider how these mechanisms could be received by the public, including communities with environmental justice concerns, in the unique historic context of the affected environment. We recommend that conclusions regarding environmental justice impacts attempt to reflect the mental and emotional health impacts and the larger cumulative sense of loss and injustice, and not only the impacts to specific resources (e.g.,

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[1] Public meetings held on June 4-6, 2024 and public opinion interviews available at: https://kauainownews.com/2024/06/09/navy-nasa-want-to-renew-kauai-leases-west-side-locals-show-support-opposition/

[2] DoD Equity Action Plan p. 8. Available: https://media.defense.gov/2022/Apr/13/2002976515/-1/-1/0/DOD-EQUITY-ACTION-PLAN.PDF.

[3] Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee, March 2016. Available: https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf.

transportation, recreation/hunting, or to cultural resource access). After reviewing and identifying these additional military land use impacts on environmental justice, please identify corresponding mitigation measures in the Draft EIS. Examples could be establishing regular communication channels to strengthen relationships with the Native Hawaiian community, and in consultation, exploring other State-owned military lands that may be underutilized and could be repurposed for community use.

Climate change effects/incorporating resilience

The newly added PMRF site is very close to the shoreline. Should this site be selected, the facilities will experience various climate change effects that can bear on both the project and on environmental resources. According to the State of Hawai'i Sea Level Rise Viewer[4], the shoreline of Kauai at the project site will experience sea level rise and coastal erosion that approaches the development site. The FEMA flood hazard zone already begins to encompass the site, and additional hazards associated with storm waves are indicated. Modeling results for the 1%-annual-chance coastal flood zone with 3.2 feet of sea level rise, which estimates coastal flood extents for wave-generating events including tropical storms, hurricanes, tsunamis and other severe wave events, show the entire PMRF within the coastal flood zone. This indicates increased vulnerability to coastal event-based flooding by the year 2100. Please refer to the West Kaua'i Community Vulnerability Assessment[5] for more information.

We understand it is Department of Defense (DoD) policy to identify and assess climate change effects on the department's mission, and to consider them when developing plans. According to a DoD report[6], a decision that involves enduring or permanent infrastructure meant to perform at least 50 years into the future, is mission critical with limited alternative options, and represents an irreversible commitment of resources, would dictate a consideration of higher-end sea level rise scenarios.

Recommendations: EPA strongly recommends that the design of the PMRF alternative include components to protect the asset from climate change effects. Prioritize preservation and restoration of natural landscape features, such as coral reefs, beaches and dunes, floodplains, and wetlands, that have the inherent capacity to avoid, minimize, or mitigate the impacts of climate change. Discuss applicable nature-based project elements that can be integrated into the project design, exemplified by the U.S. Army Corps of Engineers "Engineering with Nature" program.[7] Discuss both gray and green infrastructure, and combinations of both. Discuss whether increasing dune restoration would protect both the project and important cultural sites. Discuss how current groundwater pumping at PMRF will affect the project, and if updating pumping practices would increase resilience.

It is also important to acknowledge, as noted in the West Kauai vulnerability assessment, that sea level rise threatens the West Kauai transportation system, including the Kaumuali'i Highway, which is vulnerable to sea level rise (i.e., erosion, passive flooding, wave inundation), heavy rainfall, and storm events. According to the specific Navy environmental stewardship activities (pg. 1-13) and the Best Management Practices (BMP) in Table 2-6 of the Preparation Notice, there are plans to establish a "monitoring program for the nearshore environment of the PMRF to inform future management decisions and monitor changes over time." The Draft EIS should assess the environmental impacts to

[4] Sea Level Rise: State of Hawai'i Sea Level Rise Viewer. Available: https://www.pacioos.hawaii.edu/shoreline/slr-hawaii/

[5] University of Hawai'i Sea Grant College Program, West Kaua'i Community Vulnerability Assessment, June 2020. Available: https://seagrant.soest.hawaii.edu/wp-content/uploads/2020/06/WKCVA-Final-Report-June-2020.pdf

[6] DoD Directive 4715.21, section 1.2; Section 2.2j

[7] U.S. Army Corps of Engineers, Engineering With Nature website. Available: https://ewn.el.erdc.dren.mil

relevant resources that would occur as a result of project elements necessary for climate change adaptation. It is important that these project elements be explored now and not be deferred, as time may be needed to develop nature-based project features. Hardening features such as sea walls and revetments should be included only after nature-based solutions have been fully explored. We believe full use of the NEPA process will be especially informative for this project and if undertaken well, can prove particularly valuable for decision-makers. Please let us know if the EPA can assist in this endeavor through early involvement during the NEPA process.

Scoping Comment Letter 0042

Raymond Catania <april8nineteen18@gmail.com> 6/17/2024 5:27 PM

Against Rimpac war exercises and Israel's active inclusion

To info@pmrf-kpgo-eis.com

Aloha,
Went to the June 6 presentation at Sheraton Coconut Beach. Our Hawaii ocean environment and Kanaka cultural resources and it's protection are being used to build U.S. military superiority in the Pacific and Asia- "from the ocean bottom up to the atmosphere." But also, Israel/IDF inclusion is part and parcel of U.S. dominance in the Middle East and the continued subjugation of the Palestinian people. Good and sincere people who believe in ocean/environmental and Kanaka cultural issues have been recruited for this purpose. Diplomacy and non-violence is the answer. What happened to civilians in Nagasaki and Hiroshima are historical lessons we should take to heart. This is "green imperialism."
Mahalo,
Ray Catania Puhi

Scoping Comment Letter 0043

Consent for storing submitted data
True

First Name
Ruta

Last Name
Jordans

Add Me to the Project Mailing List
Yes

Street
6345A Kipapa Road

City
Kapaa

State
HI

Zip code
96746

Email
zwknow@gmail.com

Organization/Affiliation (if any)
Zero Waste Kauai

Comments

See attached file

Add Attachments (optional)

pmrf_and_kpgo__eis_scoping_letter_from_zwk_copy.docx

Submitted on
06/16/2024

PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells,

Thank you for the opportunity to make suggestions that should be considered by PMRF in its Real Estate Environmental Impact Statement.

Zero Waste Kauai was founded in 2006. Our mission is to educate, inspire and assist the government, businesses, residents and visitors of Kauai in transitioning to a zero waste society and to advocate policies and implement programs that move Kauai toward a zero waste society.

Zero Waste Kauai is most concerned about environmental impacts of waste generation and disposal. We appreciate the large solar array at PMRF which has decreased the use of fossil fuels to produce energy. However, we would ask you to include in the EIS what PMRF is doing to reduce the amount of waste generated, specifically on how waste such as recyclables, organics, and construction and demolition wastes are reduced and/or diverted from the landfill and how PMRF is promoting a circular economy.

Please consider the following issues in the EIS:

The Kekaha Landfill is due to be full in the next two to six years. Making less trash or diverting usable materials would extend the life of the landfill. Zero Waste Kauai has consulted with PMRF in the past on diversion opportunities, specifically for organics, but, to our knowledge, no action has been taken. Diversion of organics (food waste and green waste) from the landfill to composting eliminates the production of methane in the landfill and produces a soil amendment which holds water and makes more nutritious soil. PMRF has a large population of residential and commuting personnel, which produces much usable food waste.

According to https://www.defense.gov/News/News Stories/Article/Article/612710/ Pentagon officials said that climate change is a security risk because it degrades living conditions, human security and the ability of governments to meet the basic needs of their populations. It is obvious that the risk is even bigger for islands in the middle of the Pacific Ocean. Recycling helps combat the climate crisis by limiting the use of raw materials and reducing waste going into landfills. https://www.colorado.edu/ecenter/2023/12/15/impact-recycling-climate-change" How will the EIS address these issues?

Ruta Jordans, Zero Waste Kauai President, zwknow@gmail.com

Scoping Comment Letter 0044

Consent for storing submitted data
True

First Name
Maria

Last Name
Walker

Add Me to the Project Mailing List
Yes

Street
PO Box 33

City
Kapaa

State
HI

Zip code
96746

Email
maria.makaleha@gmail.com

Organization/Affiliation (if any)

Comments

Aloha, I am strongly in favor of Option 3 in the plan for the future of the properties currently being used by the Navy and NASA. The history of military presence in Hawaii has clearly shown that the US government has no respect for the land, water, or people of Hawaii; that they are willing to exploit natural resources with impunity and leave behind toxic waste that they refuse to clean up; that they desecrate historical and cultural sites with no consideration for this place, and that they occupy these lands while paying no reasonable taxes or rent for them. The coast at Mana should be open and free for residents and visitors to use, and the rest of the west side land needs to be saved for agriculture. I strongly support the Navy and NASA vacating the lands they are using, cleaning them up thoroughly, and returning the properties to their natural condition before they were developed. i do not believe there are any positives for our residents, visitors, or island land and waters in continuing to have this military presence on Kaua'i. Thank you for reading my comment.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0045

Consent for storing submitted data
True

First Name
James

Last Name
Trujillo

Add Me to the Project Mailing List
Yes

Street
1728 Hulu Road

City
Kapa'a

State
HI

Zip code
96746

Email
07trujillojames18@gmail.com

Organization/Affiliation (if any)

Comments

Aloha, I recommend the 3rd option- allow the lease to expire and return the land to the state and the people of Hawai'i The demilitarization of Hawai'i, while supported by some but opposed by most, is a modern day reality in our post colonial world. As America struggles with it's white supremist past, the peoples of the Pacific will continue to seek balance and harmony with the natural world. This will be made possible by taking the first steps in decommissioning the PMRF along with other military installations and facilities in the state. Reconsolidation of military operations in the state and limited to O'ahu is the next step in de-occupying Hawai'i. Mahalo for considering this testimony on the draft EIS for PMRF & KPGO. Again, I favor the 'No Action' option and encourage you to look favorably on Option 3 With respect and aloha, James Gerard Trujillo Makaleha, Kapahi, Kaua'i

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0046

Consent for storing submitted data
True

First Name
Kevin

Last Name
Houck

Add Me to the Project Mailing List
Yes

Street
4762 menehune road

City
Waimea

State
HI

Zip code
96796

Email
kevin@drinkmorekava.com

Organization/Affiliation (if any)

Comments

Hi, Please reopen and remove restrictions to coastal access of the entire mana shoreline for coastal access for surfing, Kayaking, canoeing, fishing, walking, horseback riding and cultural practices. The pmrf guest card program is a great program that provides some access to some of the shoreline but it does but provide access to all of the areas that are recognized as public shoreline by the State of Hawai'i set forth in Hawai'i Revised Statutes Chapter 205 a Coastal Zone Management (attached) regarding the public access right to coastal areas. There are still several miles of ka moaena hohola o mana that are not accessible. Thanks for your time and stewardship of this area, and have a nice day. Aloha, Kevin

Add Attachments (optional)

Submitted on
06/17/2024

legislature shall be binding upon actions within the coastal zone management area by all agencies, within the scope of their authority. [L 1977, c 188, pt of §3; am L 1979, c 200, §3; am L 1989, c 356, §6]

§205A-5 Compliance.

(a) All agencies shall ensure that their rules comply with the objectives and policies of this chapter and any guidelines enacted by the legislature.

(b) All agencies shall enforce the objectives and policies of this chapter and any rules adopted pursuant to this chapter. [L 1977, c 188, pt of §3; am L 1979, c 200, §4; am L 1989, c 356, §7; am L 1993, c 258, §3]

§205A-6 Cause of action.

(a) Subject to chapters 661 and 662, any person or agency may commence a civil action alleging that any agency:

(1) Is not in compliance with one or more of the objectives, policies, and guidelines provided or authorized by this chapter within the special management area and the waters from the shoreline to the seaward limit of the State's jurisdiction; or

(2) Has failed to perform any act or duty required to be performed under this

Scoping Comment Letter 0047

Consent for storing submitted data
True

First Name
Steve

Last Name
Parsons

Add Me to the Project Mailing List
Yes

Street
3522 Uwao

City
Hanapepe

State
HI

Zip code
96716

Email
STEVE@TEAMPARSONS.COM

Organization/Affiliation (if any)
Kauai EV and Kauai Climate Action Coalition lead

Comments

Aloha EIS Team, While I understand this is just the beginning of the EIS process, I also get, at a high level, that we as a species have a very short window of time to decarbonize our world before unmanageable tipping points are crossed leading to UNIMAGINABLE Climate Chaos! Kauai is one of the Crown Jewels of our planet regarding natural beauty, ecosystems that provide life to us, and it is under massive assault! Conversely, It is also an example of what can be done to fight climate change Faster than anyone thinks possible. Our power coop KIUC, went from about zero renewable energy about 20 yrs ago to about 60% today with plans to 100% RE within 10 yrs. Great, now we just need to electrify everything ASAP to eliminate all fossil fuel burning on Kauai. In fact, Kauai Climate Action Coalition along with the Surfrider Foundation Kauai Chapter, and Zero Waste Kauai are launching an #ElectrifyKauai campaign in July that we'd like PMRF to possibly collaborate on, but at a minimum we are asking PMRF to join and promote this campaign. Imagine, PMRF and KPGO to be the first in the nation to go all electric faster than anyone thought possible. We ask that you go really big in your thinking and brainstorm how you can unleash millions of Green Infrastructure dollars to accelerate the electrification of Kauai. Like the solar battery array you did with KIUC and AES, but BIGGER!!!! Perhaps like what joint base Hickam just launched last week. .https://cleantechnica.com/2024/06/14/powering-10000-homes-ameresco-celebrates-the-commercial-operations-of-kupono-solar-at-joint-base-pearl-harbor-hickam/ In the meantime, use Hawaii grown Biodiesel from Pacific Biodiesel for everything that is diesel to see an immediate 85% reduction in air pollution! As a former Gulf war vet that has 50% service related disability for serving in a war for Oil, would encourage the Department of Defence to look at fast electrification as a national defence strategy, a financial cost saver and climate mitigation plan including harding infrastructure all in one! Lastly, be wary of

the s-curve like acceleration of ever worsening effects of climate change. For example, we have had approximately 1ft of SLR (Sea Level rise) in the last 80 yr. the next ft. is projected to come in the next 30 yrs., the next in 20...etc. However, there are wildcard variables our there like Thwiaites Glacier https://www.sciencefocus.com/planet-earth/doomsday-glacier-prevent-flooding will raise seas 2ft alone and then will allow another 10 ft of rise to release from all the ice it's damming. This could happen in decades, not centuries. So the sense of urgency that needs to be deployed ASAP cannot be understated. Here is what we are doing and we implore you to Join Us in the Electrify Kauai Campaign, by doing so you will aggressively attack your greenhouse gas emissions. Below is a draft of our #EK campaign. Please pardon any typos/grammatical errors as this draft is being launched on our website with QR code sign ups in early July. https://www.kauaiclimateactioncoalition.com/ #ElectrifyKauai A Big Mahalo for stopping by and learning how you can help fight against climate change and save money and the Aina by joining the #ElectrifyKauai Campaign! The scientists at UH (University of Hawaii), like Chip Fletcher, tell us we need to stop burning all Fossil Fuels ASAP and electrify Everything everything Why Electrifying Everything Is Not Just For Elites - CleanTechnica to avoid the worst effects of the Climate Crisis that is harming Kauai in so many ways: Increased drought, Wildfire risk like Maui, Massive Rain events causing historic flooding way more often like Kauai's 2018 floods, Losing our Native Birds due to a warming climate that allows mosquitoes to reach higher elevations, Sea Level Rise taking our beaches, our precious Coral Reefs are undergoing local and global mass bleaching events from record ocean heat and ocean acidification, and many more! Now the good news… By clicking the “Join Us” button your are taking ACTION and deciding to choose Clean-locally produced Electricity over dirty imported Fossil Fuels for your Transportation, in your Homes and businesses by Switching to Heat Pumps For Hot Water and Clothes drying, and by using electrical yard equipment, and battery backup Power banks instead of air polluting gas generators. The #EK campaign is an honor system and you choose when and how you switch. This is simply a resource to help you get there, faster than you think possible. Furthermore, we are not into climate-shaming around here. What we are into is Cleaner Air, Cleaner Oceans and by taking the following actions for your home and business, YOU are making a big difference! And a little more good news, most of the suggestions below have a significant money saving benefit including tax rebates. A complete resource on how to Go Electric and pay for it can be found at Rewiring America Now Join Us by going Electric in the following areas. #1 Go Electric with your transportation choices EVs (Electric Vehicles) Like Electric Cars Trucks to E-Bikes and E-Scooters. Many rebates available making Some nice EV’s are now 10k less of the avg. car price (https://cleantechnica.com/2024/04/12/tesla-model-y-model-3-cost-10000-less-than-average-new-car-price/) and cost way less in charging costs and maintenance. https://advocacy.consumerreports.org/wp-content/uploads/2020/10/EV-TCO-Overall-Fact-Sheet-FINAL-3.pdf or do your own ICEV (Internal combustion engine Vehicle) Vs EV comparison to see how much you can save per yr here: https://chooseev.com/savings-calculator/ #2 For Hot Water Heating Choose Heat HPHWH (Heat Pump Hot Water Heaters) Electrify government buildings, homes and businesses by promoting Heat Pumps!!! Here’s a funny locally made video to show how heat pumps work: Hawaii Energy - "Heat Pump" (2022) (caveat on the Video $500 rebate comes from KIUC for us) Usually, they are less than half the cost of solar hot water heaters. Fun efficiency Fact, If you switch out a reg.electric HWH with a HPHWH, you will save enough Electricity to power you car: https://cleantechnica.com/2023/10/06/a-heat-pump-water-heater-will-save-all-the-electricity-youll-need-to-power-your-electric-vehicle/ Think about how much time and money you could save by Going Electirc and keeping all that money on Kauai instead of sending it off island. If you rent, share this info with your landlord and direct them to this site. #3 If you can’t hang your clothes to dry, Choose a Heat Pump Clothes Dryers! (Some examples https://www.homedepot.com/b/Appliances-Washers-Dryers-Dryers-Electric-Dryers/Heat-Pump/120-volt/240-volt/N-5yc1vZc3q1Z1z17j86Z1z17ja4Z1z1dtqi?NCNI-5&sortby=price&sortorder=asc&onDisplay=false # For Cooking...Go INDUCTION, Baby! Induction appliances are up to three times more efficient than gas stoves, and up to 10% more efficient than conventional smooth top electric ranges. This improved efficiency performance can result in lower energy costs as well as lower rates of air pollution associated with energy generation Induction stoves are also free of the indoor air pollutants that come from gas stoves: burning gas for cooking produces nitrous oxides (NOX), carbon monoxide (CO), and formaldehyde (HCHO), which can have negative health effects

and exacerbate respiratory conditions. According to a 2022 study, 12.7% of current childhood asthma in the United States is attributable to gas stove use. .May 11, 2023 https://www.energy.gov/articles/making-switch-induction-stoves-or-cooktops #4 Electrify Tools and Yard equipment and get rid of the smelly gASS Powered ones. Americans use ~800 million gallons of gas per year mowing their lawns, producing tons of air pollutants. Lawn equipment emissions went largely unregulated until the late 1990's. As a result, they emit high levels of carbon monoxide, volatile organic compounds and nitrogen oxides, and produce up to 5% of the nation's air pollution More info and examples of how other areas of the country are making the switch fast can be found here: https://bedford2030.org/the-health-benefits-of-switching-to-electric-lawn-equipment/ #5 Electrify Food Trucks and street vendors and businesses/home power back up with Battery Backup systems that continue to fall in price and can be charged with solar. https://electrek.co/2023/10/23/food-trucks-are-switching-out-dirty-gas-generators-with-this-zero-emissions-option/ This is the right course of action for Cleaner Kauai and serves as a shining example to the world of what can be done and we believe Faster than anyone thinks possible and residents and visitors immediately start enjoying the benefit of Cleaner Air and Oceans! Everyone wants Clean Air! Check out the TOP TEN Benefits of Joining Electrify Kauai Campaign (*In no particular order) #1 Save Money Personally (Electricity is Cheaper than gas from EVs to Heat Pumps there are so many ways to Save! # Kauai County, Businesses and nonprofits Save money #3 Cleaner Air! Fossil Fuel Kills millions of people a yr: https://www.theguardian.com/environment/2023/nov/29/air-pollution-from-fossil-fuels-kills-5-million-people-a-year by By choosing electricity you are choosing cleaner air. #4 Cleaner Oceans! Surfers and Water people love their EVs, because they love the Ocean and fossil fuel pollution causes Ocean acidification that is killing our corals and other marine sea life along with ocean heatwaves: What is Ocean Acidification? #5 Feel good about doing your part for the next generations by acting now to mitigate the worst effects for them. https://climatecommunication.yale.edu/publications/distress-about-climate-change-and-climate-action/ #6 GOOD, Local Green Jobs are created when we go Electric. In Fact, training for this is being expanded at Kauai Community College so residents can train for a great profession! Electrical Installation and Maintenance Technology | Kauai Community College #7 EVs can also support grid and via bidirectional charging as well as be a backup power source for 1st Responders, Businesses and homes: https://cleantechnica.com/2023/10/13/electric-vehicles-play-a-surprising-role-in-supporting-grid-resiliency/ EV Charging And The Grid — The Truth Is Out There - CleanTechnica #8 This will eventually help to fight inflation by lowering demand for oil and gas and thereby prices! Ironically, this also helps folks that cannot yet afford or acquire an EV, by lowering gas prices. #9 Help Kauai continue to be a shining example to the world of how to be environmentally Pono! In a not too distant past.. Kauai's power generation was about 99% from burning fossil fuels to over 57% year round renewable energy today, and targeting 100% by 2033. This was accomplished faster than anyone thought possible and we will electrify Kauai faster than anyone thought possible, All this can happen, but only with your help, so Join us now! "Pledge Button Here"! End of Example... Please Act boldly to fight climate change!!! Mahalo, Steve Parsons, Lead for Kauai Climate Action Coalition and Kauai EV, Surfrider Foundation outreach team, Kauai Board of Realtors Green Real Estate & Sustainability committee Chair, Hanapepe Kauai 808-651-3232c REALTOR® Broker, RB-22077 kwBig Island | RB-23793

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0048

Consent for storing submitted data
True

First Name
R.

Last Name
Chong

Add Me to the Project Mailing List
Yes

Street
650 Paikau Street

City
Honolulu

State
HI

Zip code
96816

Email
rdbtec@aol.com

Organization/Affiliation (if any)

Comments

Support: Alternative 1 - Extend Leases. Alternative 2 - Fee Simple Acquisitions. Disagree with Leaving Hawaii.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0049

Consent for storing submitted data
True

First Name
keala heanani

Last Name
Carter

Add Me to the Project Mailing List
Yes

Street
Puu Road

City
Kalaheo

State
HI

Zip code
96741

Email
kealacarter@gmail.com

Organization/Affiliation (if any)

Comments

None of the three alternatives reflect the change of attitudes towards the environment, frontline communities and limited land and water resources reflected in Hawaii today versus Hawaii in 1965. Using Alternative 2 as a more extreme option to make the continuance of another long lease occupying massive acreage, reflected in Alternative 1 seem reasonable is not a sincere effort to provide real alternatives. Instead, it creates a sham choice between alternatives like 1 and 3 that are obviously very improbable politically. Instead of using the Alternatives 1 and 3 to push people in the direction of Alternative 2, offering some real "alternatives" to the status quo and incorporating the environmental justice guidance of the Biden Administration could offer the community the chance to participate in the future of PMRF and the Kokee Observatory in a transformative way and also restore some of the trust lost from the Red Hill crisis. The community of the West Side of Kauai, particularly Kekaha, is distinct and has different values and needs that many of the other communities on the island. It is already an area disproportionately saddled with industry with less access to a variety of employment. In today's climate, an alternative that considers benefit to the immediate communities living near the base, and consulting with them to articulate community benefits, which could include job training or apprenticeships, access to the cultural sites on the base and more investment in the frontline community and environmental remediation and enhancement, would signal that the Navy and NASA realize things are different now and want to consider ways to balance occupying such a huge section of land and limiting public access, with equity as a counterbalance. The renaming of the beach was a nice gesture but didn't signify the type of substantive change needed in this lease renewal. It is important to consult closely with local organizations and Native Hawaiian Organizations to understand what the communities of West Kauai consider important instead of just pushing for another extremely long lease that pretends things are equal to what they were in the

1960s. The vast majority of people with the higher GS jobs are not from West Kauai and creating additional pathways into employment for folks nearest would both cut down on the gas of the many contractors driving in from Kapaa and elsewhere and allow one of the lowest per capita income neighborhoods in the State an opportunity to train for skilled, tech jobs. The current administration has published several Executive Orders on Environmental Justice initiatives and it would be refreshing to see the Navy and NASA demonstrate they are embodying these priorities and looking to avoid the mistakes very fresh on locals' minds.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0050

Consent for storing submitted data
True

First Name
Ruta

Last Name
Jordans

Add Me to the Project Mailing List
Yes

Street
6345A Kipapa Road

City
Kapaa

State
HI

Zip code
96746

Email
ruta.jordans@gmail.com

Organization/Affiliation (if any)
Kauai EV, part of Hawaii EV

Comments

Thank you for this opportunity to discuss environmental issues on PMRF. Please apply whatever is appropriate for Kokee also, such as electric transportation. We are concerned about the large number of commuters driving back and forth, many even coming from the north and east of Kauai, with most driving ICE (internal combustion) vehicles. I happened to be in the Waimea Visitors Center one afternoon when PMRF let out, about 4pm. There seemed to be a never- ending stream of cars. I have also been on base and discovered the long distances from one part of the base to the other. Therefore we would like you to consider ways to lower the green house gas emissions from all those vehicles. Is there a charging infrastructure on base to encourage commuters to get electric vehicles (EVs)? Perhaps investigate an electric bus system to transport to and from PMRF to the east or north side - depending on how many people commute from there. Do you have those figures? PMRF could also have an inter-base electric bus system to reduce green house gas ICE driving within PMRF as well as up to Kokee.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0051

Claire Tonry <clairetonry@gmail.com> 6/17/2024 10:26 PM

Comments on scoping materials

To info@pmrf-kpgo-eis.com

Please see the attached comment letter which I have also submitted via the comment form online.

Mahalo,
Claire

Work email: claire@smithandlowney.com

This email may contain attorney-client privileged communication. If you are not the intended recipient, immediately notify me that you received this message and delete all copies of it.

- Tonry PMRF NEPA Scoping Comments_240617.pdf (158 KB)

CLAIRE TONRY
P.O. BOX 1180, WAIMEA, HI 96796
clairetonry@gmail.com

June 17, 2024

***Via Email* (info@PMRF-KPGO-EIS.com)**
Naval Facilities Engineering Systems Command, Hawaiʻi
Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Re: Comments on PMRF and KPGO EIS Scoping Process

Dear Ms. Kerry Wells,

I comment to express some of my concerns with the PMRF and KPGO (hereafter collectively referred to as "PMRF") NEPA scoping process. The two action alternatives currently proposed for consideration in the EIS are too similar, especially as to their impacts on the human environment. Additional, more distinctive action alternatives need to be considered in detail in the draft EIS.

Such additional alternatives should include meaningful conservation measures for Mānā, Kōkeʻe and other affected areas, such as adding a conservation easement component to the expiring easements in renegotiations. The industrial pesticide and bioengineering research and development by multinational chemical manufacturers that is currently occuring under the exisiting easements is the source of significant toxic pollution which threatens local communities and state and federally protected rare and endemic species. The Navy should evaluate alternatives that ensure that agricultural use of the areas under Navy easements is no longer counterproductive to the federal agencies' responsibilities under the Endangered Species Act and their own regulations to, inter alia, protect and recover listed species. Further expanding the Kawaiʻele Bird Sanctuary (or similar reserve complex) should be examined across the action area for the same reason. The alternatives analysis should also include different approaches to reduce and eliminate the need for the Navy's overreliance on dirty diesel generators.

A revised scoping notice and the draft EIS should also examine how a broader range of alternatives would each interact with planned, foreseeable, proposed, and needed development and restoration on Mānā and surrounding areas, including: the West Kauaʻi Energy Project (as may be revised); infrastructure for Department of Hawaiian Homelands use; water diversions to support instream flows; groundwater use restrictions and needs; siting and construction of a new landfill; the ongoing need for pollution control improvements to the Mānā ditch system; and Kauaʻi's acute need for affordable housing.

It is difficult to comment on the scoping materials' summary of best management practices because these activities are not well-quantified, and it is unclear which activities pertain to the leased and easement lands. Please reissue the materials with these clarifications for further public comment.

Thank you for your consideration.

/s/ Claire Tonry

Scoping Comment Letter 0052

Roslyn Cummings <roslyncummings@ymail.com> 6/17/2024 11:59 PM

Memorandum: Naval Facilities Engineering Systems Command, Hawai'i Environmental OPHEV2

To info@pmrf-kpgo-eis.com • whs.pentagon.esd.mbx.white-house-suspense-desk@mail.mil • keira.kamiya@hawaii.gov Copy COK County Attorney <cokcountyattorney@kauai.gov> • COK Council <cokcouncil@kauai.gov> • dlnr@hawaii.gov • dlnr.cwrm@hawaii.gov • cchun@tghawaii.com • hirec@dcca.hawaii.gov

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Addition to correspondence
I would like to request for data on water: in the US NAVY and NASA contracted area(s)

Water amount usage, water quality, drainage, and maintenance

Along with data on the archeology surveys, with updated information on na Iwi kupuna ancestral bones (remains) found.

If a FOIA, or UIPA needs to be submitted please be as transparent as possible

Along with including the federal, state, and county laws that are being used.

In protection of our cultural heritage; hahai holoholo na, kahua, mahi'ai, lawai'a, mo'omeheu, mea ho'olako, and many more.

Waiwai is our wealth as na kanaka, kanaka oiwi, po'e kanaka, kanaka maoli

It is our natural resources, nutrients of which nourishes aina kino, imprints, and much more .

Wai is also very important to me

Mahalo,
Manawaiakea

ATTN: PMRF and KPGO
RE; EIS Project Manager, Ms. Kerry Wells 400 Marshall Road, Building X-11 Pearl Harbor, HI 96860

MEMORANDUM

From: Roslyn Nicole Manawaiakea Malama mare Cummings: Under Duress Kalaheo Ahupua'a, Moku O Kona, Kaua'i Mokupuni a Hawaiian Organization - U.S.DOI EMAIL: mana.eolakakouhawaii@gmail.com Post Office (Box 315), Kalaheo, Hawaii, 96741, in the Hawaiian Islands

SPECIAL Attention: File to the Current Director / CEO / CFO/ District Manager only
Not General Processing

TMK (1)9-9-001:000 (1)2-002-013-0000 is hereby request, and that a copy be furnished/transmitted to all participants for proof of title (chain of title) concurrent to County Tax/Bureau of Conveyances Bureau examines, records, indexes, and digitizes over 344,000 Regular System and Land Court documents and maps annually; issues Land Court Certificates of Title. Kauai County Code, Real Property Assessment Division's purpose is to assess all properties within the County of Kauai, which means, to provide accurate, uniform and timely assessment information; maintain the update ownership information; create and revise tax maps for all of Kauai's properties annually.

"alleged" Industrial; Conservation
NON-TAXABLE status Government: USA C/O NAVAL FACILITIES ENGINEER CMD ATTN: RE CONTRACTING OFFICER, AM1
258 MAKALAPA DR STE 100
PEARL HARBOR HI 96860 3121

The United States, State of Hawaii, County of Kauai Agents and Agencies own Oath to uphold U.S. Constitution, Laws and Treaties, makes them legally LIABLE through 42 USC §1983 for VIOLATIONS of the 1949 Geneva IV, 1907 Hague Conventions IV, USC 5 §1331, USC 18 §956, §957, §1623, §1651, §1652, §1653, §1660, §1661, §1091, §2441, §1654, Article 1 §8 and Article 6 §2 of the United States Constitution that are being committed here in the Hawaiian Islands / Sandwich Islands by use of:

1) (TMK) Tax Map Key Numbers to identify Location

2) (TMK) Tax Map Key Numbers to determine Title

3) (TMK) Tax Map Key Numbers to collect Taxes

4) (TMK) Tax Map Key Numbers to retain Jurisdiction over Internationally Protected Persons and Internationally Protected Property

5) (TMK) Tax Map Key Numbers to Pillage, Destruct, and Appropriate Protected Persons and Private Real Property not needed by Military Necessity

6) (TMK) Tax Map Key Numbers to authorize the carrying of deadly weapons such as Small Arms and Light Weapons.

Therefore, committing the act of PILLAGING, DESTRUCTION AND APPROPRIATION under Rules of War 1949 Geneva IV under 18 U.S. CODE §2441 and Violating his Majesty the King of the Hawaiian Islands Kamehameha III 1850 self executing ratified Treaty with the United States of America under U.S. Constitution Article 1 §8 and under U.S. Constitution Article 6 §2.

Agents and Agencies mentioned above must comply and are subject to Kamehameha III Treaty, Constitution, Laws, Civil and Penal Codes of the Hawaiian Islands once within three miles from the low water mark near the shore of the Hawaiian Islands.

That a confirmation of the Hawaiian Islands, Hawaiian Kingdom in continuity, nation-state status as a Neutral Power (May 11, 1854), be confirmed by the U.S. Department of the Navy (DOD) (U.S. Constitution Art. 6. Sec. 2 Treaties...supreme law of the land….", as the paramount guideline document, governing the conduct and mutual obligations of belligerents and neutrals regarding the "proposal" under consideration. That, the Neutral Power status of the Hawaiian Kingdom, precludes the U.S. Department of Defense (DOD), Dept. of the Navy from obtaining entry in to the Hawaiian Islands by way of the U.S. Federal Constitution Corporation, aka STATE OF HAWAII (SOH), Municipality TMK (tax map key - keyed only with no determination of ownership), whereby illegalities arise under the U.S. Constitution Art. 4. Sec. 3, "New States...no new states may be erected". That, the U.S. Corporation aka STATE OF HAWAII, officially exists only within the 10 mile square of Washington D.C. as permitted under the District of Columbia Act of 1887. That, the SOH adopted the U.S. Federal Constitution (Admiralty, Maritime, Equity), and therefore is already attached to the Consultor , i.e. U.S. Dept. of the Navy, as part of the administering authority, as a municipal and civilian militia, under GENEVA IV, and as such, any participant(s) thus far, who are attached, or function in any way, by or under the authority of the SOH or its Municipalities, MAY NOT UNDER ANY CIRCUMSTANCES be empowered to give CONSENT. That is how Section 106 Consultations are carried out in

“Indian country”, where consultation does not imply that consent is automatically given. That, the U.S. DOD recognize that “The Apology Law” U.S. Public Law 103-150, 23 NOv. 1993, Pres. W. J. Clinton, HAS NO FORCE OF LAW IN THE HAWAIIAN ISLANDS, but only within the contiguous territory of the 48 United States of America,, and cannot be lawfully used by the US DOD, as an automatic right of entry into the neutral territory of the Hawaiian Islands, currently under U.S. “belligerent” occupation, nor can the US DOD, impose any distinction, exclusion, limitation or restriction upon the neutrals of the Hawaiian Kingdom in continuity, by way of its Corporation aka State of Hawaii, that discriminates, in any way, against the Kanak Maoil, whose “national origins”, and vested rights in property and natural resources are perpetual and inherent, under the Hawaiian Laws promulgated in 1841-1842, by His Majesty Kamehameha III, Lahainaluna, Maui. nor their Power and Duties a a neutral nation-state in continuity. It is to be understood that, ALL State of Hawaii AGENCIES, or persons or organizations operating under that entity, under color of law or color of statute, doing business in the Hawaiian Islands, are to be considered as consultants to the US DOD Dept. of the Navy, and ARE CONFLICTED OUT, and DO NOT POSSESS THE AUTHORITY TO GIVE CONSENT to the “proposal” under consideration. Furthermore, the location of the proposed activities, by way of a SOH Municipal ‘tax map key, keyed only for the purpose of location and taxation, but with “no determination of’ ownership, CANNOT BE USED TO INFER OR IMPLY ANY TRANSFER OF THE TITLE TO THE TERRITORY OF THE HAWAIIAN KINGDOM, HAS EVER LAWFULLY OCCURRED, under the U.S. Constitution or the norms of customary international law.

Although the US Corp. State of Hawaii controls and disposes of the lands and resources within our neutral territory, any parties being of na kanaka descent, or having national origins” in the Hawaiian Kingdom automatically have availed themselves of their neutral status, power and duties, if those persons are a part of any agency or organization of the US Corp. SOH, and they shall be, considered as part of the Belligerent occupation force on land, as articulated in the provisions and prohibitions of GENEVA IV (US 1907 - THE HAGUE), for the purpose of, and in conjunction with this consultation under the U.S. NHPA. For the purpose of this consultation, the terms and conditions of GENEVA V, GENEVA V Chapter 14, the 1955 REVISED LAWS OF HAWAII, dictate the proper protocols, authorities, and entities that are empowered to ensure protection for the “ prehistoric and historic properties“CERTAIN RIGHTS OF THE PEOPLE - HAWAIIANA, under the Hawaiian Laws, and Hawaiian Kingdom Flag, second only to the Stars and Stripes of the U.S. that flies over the Hawaiian Islands neutral territory as the flag of a Belligerent, defined in GENEVA IVLaws and Customs of War on Land, and its Annex Regulations Concerning the Laws and Customs of War on Land (U.S. 1907 -THE HAGUE) - (See: “The Apology Law” “...act of war against a friendly nation….”, in violation of the U.S. War Powers Act, and international treaty violation US Constitution Article 6. Sec. 2) since Jan. 17, 1893, as that infamous act constituted a military insurrection in support of a coup demain.

FAILURE TO COMPLY WITH THE PRESENT TERMS , CONDITIONS, AND OBLIGATIONS SPECIFIED IN US DOD DIRECTIVE ON CONSULTATION UNDER SECTION 106 OF THE US NHPA VALIDATES THE CONTINUATION OF THE ONGOING CRIMINAL CONSPIRACY TO ILLEGALLY MAINTAIN CONTROL OVER THE HAWAIIAN ISLANDS & ARCHIPELAGO. As per the terms and conditions of the May 11, 1854 Hawaiian Kingdom - (Hawaiian Islands), signing of the “Declaration of Accession to the Principles of Neutrality”, and for the purpose of this “Consultation” shall be applicable: RIGHTS AND DUTIES OF NEUTRAL POWERS AND PERSONS IN WAR ON LAND (HAGUE) (1907-THE HAGUE, U.S. Senate advice and consent on March 10, 1908, U.S. Presidential ratification on Feb. 23, 1909, Entered into force on January 26, 1910, Proclaimed by the President of the United States on February 28, 1910, 36 stat.2310; Treaty Series 540 - Convention Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land), as follows; CHAPTER I - Rights and Duties of Neutral Powers. Article 1. The territory of neutral Powers is inviolable. Article 2. Belligerents are forbidden to move troops or convoys of either munitions of war or supplies across the territory of a neutral power. Article 10. The fact of a neutral power resisting, even by force, attempts to violate its neutrality cannot be regarded as a hostile act. CHAPTER III - Neutral Powers (The nationals of a State which is not taking part in the war are considered neutrals.) Article 17. A neutral cannot avail himself of his neutrality: a - “...commits hostile acts against belligerent; b - “...commits act in favour of a belligerent, or by enlistment. Article 18. “...acts...not...considered as committed in favour of one

belligerent” b - Services rendered in matters of police, or civil administration. CHAPTER IV - Compensation shall be paid...in proportion to the material used, and the the period of usage. \ NOTE: Under the Provisions of Article 22. Notification - To the Netherlands Government that the territory of Hawaiian Kingdom in continuity, is under U.S. “Belligerent” occupation as of Jan. 17, 1893, by an “act of war”, U.S. President Grover Cleveland, before the Congress of the United States, requesting for notification to all other Powers of the Hawaiian Islands status as a “neutral territory”, under international law. In closing, i strongly recommend a review of these un-precidented circumstances that have arisen during thee NHPA Section 106 Consultations by the U.S. NAVY, (AS PART OF CINCPAC Headquarters), regarding the imposed use of U.S.National Historic Preservation Act (NHPA) in the “non-contiguous territory” (U.S.Public Law 99-239 Compact of Free Association Act of 1986 - Title II - Pacific Policy Reports), of the Hawaiian Islands, by reason that the U.S. Corporation aka STATE OF HAWAII CAN ONLY EXIST WITHIN THE 10 MILE SQUARE OF WASHINGTON D.C., THEREFORE THE USE OF THIS FEDERALLY CONSTITUTED CORPORATION TO IMPOSE U.S. LAW IN HAWAII IS A CONSTITUTIONAL VIOLATIONS UNDER ARTICLE 1 SEC. 8, ARTICLE 3. SEC. 8,, ARTICLE 4. SEC 3,. AND ARTICLE 6. SEC. 2. THE QUESTION ARISES AS REGARDS TO, BY WHAT CONGRESSIONAL AUTHORITY OR EXECUTIVE ORDER IS THE U.S. DOD CLAIMING TO HAVE AUTHORITY TO OCCUPY THE NEUTRAL TERRITORY OF THE KINGDOM OF HAWAII AND CONDUCT MILITARY TRAINING OPERATIONS.BY WAY OF U.S. LAW? IN SHORT, IS THE CONSULTATION PROCESS A TROJAN HORSE.FOR THE U.S. INDUSTRIAL MILITARY COMPLEX WHICH IS IN COMPLICITY WITH, AND HIDING BEHIND THE CONSTITUENT ELEMENTS OF THE ‘ILLEGALLY PROCLAIMED PROVISIONAL GOVERNMENT THAT COMMITTED ACTS OF TREASON ON JANUARY 17,1893? The foregoing comments conclude my submissions for the record of the consultations with the U.S. Department of the Navy, under the U.S. National Historic Preservation Act, Section 106, relating to the protection of historic places and properties, and the Hawaiian Kingdom accession to GENEVA Convention V concerning the RIGHTS AND DUTIES OF NEUTRAL POWERS AND WAR ON LAND, (US 1907, HK 1854). Respectfully submitted for inclusion into the minutes of the April 30, 2018 meeting in Honolulu.

NOTE: On 2 SEPTEMBER 2018, additions, corrections and clarifications to the original text sent to Capt. Rasmussen USN, in charge of consultation proceedings have been made and are included in this text to be forwarded to Sy Heen Shim, in his capacity as a “protected person under international law, as a descendent of the “Chiefs and People” of the Hawaiian Islands, under Hawaiian Law, promulgated 1841-1842 Kamehameha III, Lahainaluna, Maui.

As a matter of law the government officials in the Hawaiian Islands, being part of the People/citizenry of the United States political subdivision aka State of Hawaii, under the adoption of the U.S Federal Constitution, have sworn an oath “to support and defend” both the United States and state of Hawaii constitutions, which requires them to ensure the native tenants due process of law, the effect of which has been for decades that the State and counties have allowed the destruction of hundreds if not thousands of Hawaiian village sites and “places of worship” throughout the islands, often to support private, and for profit land developments, at times by so-called “Emergency Proclamation" that inadvertently deprive civil liberties; in correlation to the unlawful enforcement of policies of apartheid by distinction, exclusion, restriction and limitation, based on national origin, race, color, religion and ethnicity, by way of the term “native Hawaiian" meaning any descendant of not less than one-half part of the blood of the races inhabiting the Hawaiian Islands previous to 1778, who is then subject to the right of the (US)State of Hawaii via Section (7), ARTICLE 2. Hawaiian Homes Commission sub section 201, to the right of the State of Hawaii, by way of the 1978 Constitutional Convention and election of November 7, 1978, to hold the unfettered ability to “regulate” fundamental human liberties of “subsistence” as well as their “cultural and religious” practices, constituting a “Deprivation of rights under color of law, under Title 18 U.S. Code sub-section 242, Deprivation of vested property rights held by native tenants under color of law, under /title 18, U.S.Code Section 241, lending to a Deprivation of due process under the color of HRS (Hawaii Revised Statutes 708.814.5, perpetrating a long-term pattern and practice of “Genocide” through selective enforcement of law, under Title 18 U.S. Code sub-section 1091, Chapter 50AGENOCIDE. CONSTRUCTIVE NOTICE is, also, filed regards to the “purpose(s)” of H.B. 2693, in respect for “Native and Part-native” Inhabitants, so situated within the physical maritime and territorial boundaries

of the Ahupuaa (District) Moku, Mokupuni, being a part of the Royal Domain of the Hawaiian Kingdom Monarchy, with interests restricted, and subject to the reservation of rights affirmed in 1839 by His Majesty King Kamehameha III, which are included as being part of “Hawaiian National usage”, by Her Majesty Queen Liliuokalani on November 25, 1892, (the “crown land” title carries certain specific terms and conditions, i.e. the fee-simple interest is “inalienable”, and “private”, (the United States Congress in 1993 affirming the unlawful seizure of the “crown lands” by the Republic of Hawaii, and transfer to the United States as “without the consent of or compensation to…their sovereign government…”.), and “subject to the rights of tenants…”, and who never “voluntarily surrendered…rights in the National lands…”, and who are “protected persons”, in accordance with the FOURTH (IV) GENEVA CONVENTION (US Signatory 1907 - HAGUE, and the (ICCPR) International Covenant on Civil and Political Rights, Adopted by United Nations (UN) General Assembly Resolution 2200A (XXI) of 16 December 1966 entry into force 23 March 1976, UN Charter.in accordance with Article 49, being upheld under the United States Constitution Article 6, Section 2., per the RLH 1955 - Volume I, Chapter 14, sub Section 14-8 Powers and duties, “Any law to the contrary notwithstanding…”, being consistent, and in conformity with United States policy relating to U.S.C. TITLE 16 - CONSERVATION, PART A -Historic Preservation Programs NOTICE is hereby given with respect to a request FILED 5 FEBRUARY 2024, for assistance/discretion of the United States Secretary of Interior to determine “that a major aspect of a State program is not consistent” with United States Code TITLE 16 - Part A - Historic Preservation Programs, currently under administration, within the non-contiguous Pacific area of the Hawaiian Islands, due to the absence of a Historic Preservation Review Commission as required, under USC TITLE 16, in order to properly qualify, certify and oversee the certification of historic preservation programs, of any municipality acting as a “local government” including the State of Hawaii, in order to effect compliance with the “requirement of equal footing” per USExec.P. 3309, and RLH 1955 - Volume I, Chapter 14, sub Section 14-8 Powers and duties, “Any law to the contrary notwithstanding…, in order to be consistent in regards to the administration of “Historic Preservation Programs”, under U.S.C. Title 16 - CONSERVATION, Part A, within the “State system”, in lieu of: A. The complete absence of an actively functioning, effective and sufficiently qualified Historic Preservation Review Commission, within the current State system, being administered in the, non-contiguous Pacific area of the Hawaiian Islands, as required to properly qualify, certify and oversee any “local government”, including the “State of Hawaii” in the administration of Historic Preservation Programs, per Sec. 470-1(b-A (b) -2 (B), having given rise to: 1. widespread disruption, irreparable destruction, desecration and defiling of historic sites, cultural properties and places, throughout the Hawaiian Islands; 2. disregard for family honors, rights (burials); the endangering of the lives of persons, their private property, religious sites, interference with and disregard for religious convictions and practices; 3. acts forbidden, unauthorized and malicious methods of seizure, pillage, and destruction, lending to the willful contamination and destruction of watersheds, groundwater reservoirs wetlands, rivers, forests, historic irrigation systems, estuaries and agricultural estates; 4. destruction, desecration, defiling, mutilation and molestation of institutions dedicated to religion, charity, education, the arts and sciences, being acts that are normally “forbidden”, under the Fourth IV Geneva Convention, Respecting the Customs and Laws of War on Land, and its Annex Regulations Concerning the Customs and Laws of War on Land, which should be made the subject of legal proceedings; 5. neglect on the part of the “United States, its political subdivision State of Hawaii, Municipalities and its People” to effect compliance with regard to the “equal footing” requirement of the U.S. Executive Proclamation 3309, Pres. Dwight D. Eisenhower (1959), by blatantly undermining, disregarding, avoiding and continually failing to implement and put into effect administrative structures necessary to comply with the purpose and stipulations in the Revised Laws of Hawaii 1955, Volume I, Ch. 14, CERTAIN RIGHTS OF THE PEOPLE - HAWAIIANA, Sections 14-1 thru 14-11, being representative of the “chief governing authority”; a) having brought about conditions intended to bring about the destruction of the group, as a whole and in part, b) having caused a near complete collapse of the indigenous economy, identity and way of life, in correlation to the unlawful enforcement of policies of apartheid by distinction, exclusion, restriction and limitation, based on national origin, race, color, religion and ethnicity, by way of the term “native Hawaiian” meaning any descendant of not less than one-half part of the blood of the races inhabiting the Hawaiian Islands previous to 1778, who is then subject to the right of the State of Hawaii via Section (7), ARTICLE 2. Hawaiian Homes Commission sub section 201, to the right of the State of Hawaii, by way of the 1978 Constitutional Convention and election of November 7, 1978, to hold the unfettered ability to “regulate” fundamental human liberties of “subsistence” as well as their “cultural and religious”

practices, constituting a “Deprivation of rights under color of law, under Title 18 U.S. Code sub-section 242, Deprivation of vested property rights held by native tenants under color of law, under /title 18, U.S.Code Section 241, lending to a Deprivation of due process under the color of HRS (Hawaii Revised Statutes 708.814.5, and a long-term pattern and practice of “Genocide” through selective enforcement of law, under Title 18 U.S. Code sub-section 1091, Chapter 50A - GENOCIDE.

CC: United States Department of Interior Honorable Secretary, Deb Haaland Attention: U.S. Department of Interior, Solicitor General 1849 C. Street, N.W. Washington D.C. 20420 United Nations, Human Rights Committee, Geneva, Switzerland

To: DEPARTMENT OF THE NAVY Commander United States Pacific Fleet 250 Makalapa Drive Pearl Harbor, Hawaii 96860-3131

SUBJECT; concerning Consultation on the “proposal to continue military readiness activities in the Hawaii Training and Testing Ground (HSTT) Study Area.”effects of undertakings in Hawaii, pursuant to Section 106 of the National Historic Preservation Act (36 CFR Ss800), for proposed training, testing and readiness activities located within TMK: (1)9-9-001:000*, in order to “identify historic properties, potential impacts, assess possible effects, and seek ways to avoid, minimize or mitigate any adverse effects on historic properties.” Dear Sir, You may, or may not, be aware of the historical fact that on May 11, 1854, His Majesty King Kamehameha the Third (III), by way of His Exc. Robert C. Wyllie signed the “Declaration of Accession to the Principles of Neutrality” as requested by a U.S. President. As such, the Hawaiian Kingdom, “...territory of neutrals is inviolable.”, and the peace and security of our Hawaiian Kingdom (a nation-state in continuity), and the world for that matter, has come into question, due to the lack of international recognition of the Hawaiian Islands as a neutral territory under belligerent occupation (Attachment A) in addition, there are related matters concerning our Maritime Jurisdiction, as a Neutral Power, lying within one marine league (three miles), from the coast of each of our islands (Hawaii-U.S. Convention of May 16, 1854), out to the 200 Mile EEZ, in respect for the protection and hospitality of our ports, harbors and roads, equally extended to all belligerents, so long as they respect our neutrality. In the context of this consultation, as a neutral hors de combat, ”historic properties” are defined as, the entire territory belonging to the Hawaiian Kingdom, under belligerent occupation. It is my goal, under this obligation, lest I avail myself of my neutrality, to define the extent of our powers and duties with respect to the conduct of belligerents, and ensure compliance with the terms pertaining to neutrality, and fulfill our mutual obligations and responsibilities as Parties to the Convention, towards the protection of historic properties to enhance and maintain peace and security throughout the Hawaiian Islands, Hawaiian Archipelago

Respectfully submitted, Manawaiakea a Wahine Maoli, (per June 17,1897, letter of protest filed by HRM Queen Liliuokalani, at U.S. State Department Domiciled in the Hawaiian Islands, as Part of the Polynesian Triangle

Scoping Comment Letter 0053

Kamalei Stovall <kamaleistovall@gmail.com> 6/17/2024 11:18 PM

No action- do not renew lease

To info@pmrf-kpgo-eis.com

Aloha kākou,
As a concerned resident and Native Hawaiian, I support the “no action” option to not renew the lease for the land that the military is currently occupying as the Pacific Military Range Facility. My concerns are as follows:
1. The Navy has not done their due diligence in advertising necessary information to the community.
2. The Navy is not allowing the community to speak as a group so that we may hear each other’s views.
3. The Navy is hosting the genocidal Israeli Defense Forces during RIMPAC and training them to continue to murder innocent civilians in Gaza with impunity.
4. The Navy has restricted access to Nohili (Barking Sands) to Native Hawaiians for cultural purposes such as gathering foods, medicines, lei materials, and spiritual and mental health practices.
5. The Navy has not disclosed which Native Hawaiian Organization has approved its Cultural Impact Assessment.
6. The community wants far more transparency in how the military is caring for the environment. For example: the impact on marine life and surrounding human communities caused by missile testing, and the safety and soundness of fuel storage containers.

For these concerns, and more- I strongly recommend the “no action” option to NOT renew this lease.

Sincerely,
Lauren Kamalei Stovall

Scoping Comment Letter 0054

From: Joan Heller
To: info@PMRF-KPGO-EIS.com
Subject: Lease Renewal Unwarranted
Date: Monday, June 17, 2024 3:16:03 PM

It's time to discontinue the training of
killing other beings, along with the destruction of Earth's global water, air and land resources!

With the historical American mindset towards global military dominance, funded through tax-payer/voter funds, you turn-the-tide

I, a Kauai resident

From: Joan Heller
To: info@pmrf-kpgo-eis.com
Subject: Fwd: Lease Renewal Unwarranted
Date: Monday, June 17, 2024 3:44:00 PM

From: Joan Heller <myoho@hawaii.rr.com>
Date: June 17, 2024 at 3:15:46 PM HST
To: info@pmrf-kpgo-eis.com
Subject: Lease Renewal Unwarranted

needs to begin with dis-mantling It's time to discontinue the training of killing other beings, along with the destruction of Earth's global water, air and land resources! With the historical American mindset ...
... turn-the-tide and close the Mana base by rescinding your lease renewal! I, a return Kauai resident (post-WW2 generation) has learned about the violent nature of the colonial American (Euro-centric) culture!

American militaristic training is antithetical to all life...the armed-forces leadership is out-of-control as is the President and most of Congress!

Down-grade Military Industry,
Joan Yamamoto

The NAVY tried the same tactics as developers...

- Poor advertiesement
- Divide and conquer AKA don't let us speak as a group

So, time for us to talk story!

Here is some of the mana'o shared at the meeting to **talk to your friends about** and **consider in your testimony!**

Testify: info@PMRF-KPGO-EIS.com by June 17

Scoping Comment Letter 0055

Consent for storing submitted data
True

First Name
Kyle

Last Name
Kajihiro

Add Me to the Project Mailing List
Yes

Street
2560 Campus Road, George Hall 305

City
Honolulu

State
HI

Zip code
96822

Email
kyle.kajihiro@gmail.com

Organization/Affiliation (if any)

Comments
See attached comments.

Add Attachments (optional)

2024.6.17_pmrf_kpgo_scoping_comments.pdf

Submitted on
06/17/2024

Kyle Kajihiro, Ph.D.
Ethnic Studies, University of Hawai‘i at Mānoa
kkajihir@hawaii.edu

June 17, 2024

Scoping Comments on the Pacific Missile Range Facility (PMRF) and Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement

Historical and Cultural Context

Public Law 103-150 recognizes two key facts: (1) the importance of land to Kānaka ‘Ōiwi, and (2) as a condition of the Admissions Act, public trust lands of the Hawaiian Kingdom were to be held by the State for, among other things, "... the betterment of the condition of Native Hawaiians." Further, Public Law 103-150 finds, in relevant part, "Whereas, the indigenous Hawaiian people never directly relinquished their claims to their inherent sovereignty as a people or over their national lands to the United States, either through their monarchy or through a plebiscite or referendum; Whereas, the health and well-being of the Native Hawaiian people is intrinsically tied to their deep feelings and attachment to the land" (P.L. 103-150 1993). This historical context must inform all analysis of the social and cultural impacts of the proposed action.

Purpose and Need Statement

The Navy / NASA Environmental Impact Statement (EIS) is an improper instrument for guiding the State of Hawai‘i's decision making about public trust lands

The Navy and NASA, as petitioners, and the State, as trustee for the lands in question, have fundamentally different interests and obligations. As the petitioner, the Navy and NASA have a conflict of interest with regard to their roles as the sponsors of the EIS because they have an interest in downplaying adverse impacts on State lands.

The State on the other hand, has a trust obligation to protect the land and environment, including cultural resources, especially on Hawaiian Trust Lands (i.e. "Ceded Lands"). The State cannot make a responsible decision about these lands without considering its own land

management obligations and what care the land requires. Thus, the State must conduct its own planning process to determine the best stewardship practices for the lands at Nohili and Kōkeʻe.

In the case *Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case*, Judge Gary Chang ruled:

> Public trust lands are state-owned lands that are held for the use and benefit of the people in general of the State of Hawaii. The State of Hawaii is the trustee of these public lands in the public trust. The trustee of the public lands trust has the highest duty to preserve and maintain the trust lands. This duty is broadly coined in the concept of "malama 'aina"—to care for the land. (*Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case* 2018)

Therefore, the State's primary duty is to mālama ʻāina.

The issue at the core of the purpose and need statement in the EIS must be the responsibility as lessee to care for the land as defined by the terms of the lease. In the case *Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case*, Judge Gary Chang ruled:

> Public trust lands are state-owned lands that are held for the use and benefit of the people in general of the State of Hawaii. The State of Hawaii is the trustee of these public lands in the public trust. The trustee of the public lands trust has the highest duty to preserve and maintain the trust lands. This duty is broadly coined in the concept of "malama 'aina"—to care for the land. (*Clarence Ching and Mary Maxine Kahaulelio vs. Suzanne Case* 2018)

Therefore, the Navy and NASA as lessees are governed by the terms of the lease and easements to mālama ʻāina.

The purpose and need statement must be rewritten to reflect this duty to clean up and restore the land it leases from the state. The court has found that Navy and NASA activities have caused environmental damage in violation of the terms of the lease and that the State has a duty to enforce the terms of the lease consistent with the principle of mālama ʻāina (care for the land).

Compliance with the terms of the lease or easement agreements

Provide a list of and reports for all site inspections conducted by the Department of Land and Natural Resources of the State lands and seas leased or encumbered by easement by the Navy. This is important to know whether the State has been fulfilling its trust obligations for these public trust lands.

Alternatives Statement

In line with the purpose and need to mālama ʻāina, the *preferred alternative* should be based on this obligation. The alternatives analyzed must include analysis of conducting the proposed actions elsewhere. Please provide all alternatives studies conducted by the Navy for the proposed actions.

Affected Environment

Defining the scope of the affected environment requires analysis that extends beyond the immediate region of influence (ROI) along *temporal* and *spatial* axes.

Temporal Scope: Environmental effects of past, present, and foreseeable future activities: In order to provide an accurate assessment of environmental impacts for proposed actions, an EIS must begin with a thorough understanding of the baseline and current ecological and cultural conditions of the affected site.

Baseline conditions at Nōhili and Kōkeʻe are the environmental conditions which existed *prior to military use of the land*. A reasonably accurate picture of baseline conditions can be determined by extrapolating from historical records, oral histories, cultural, archaeological, and geophysical studies, and biological studies of relatively intact native ecosystems in neighboring areas which have similar environmental conditions.

Understanding *current environmental conditions* at Nōhili and Kōkeʻe requires a comprehensive study of the *cumulative environmental effects of all past military activities* at these sites as well as the activities of other land uses, such as commercial agriculture and genetically modified crops. This study must consider effects of the proposed action that are reasonably foreseeable and have a reasonably close causal relationship to the proposed action or alternatives, including how the proposed action may compound or increase the adverse effects of past military activities.

Spatial Scope: Region of Influence (ROI): The geographical scope of analysis, or region of influence (ROI) must include environmental effects of proposed military activities on all lands within the installation boundaries, the neighboring areas, as well as more distant sites which are operationally linked to the proposed action and affected environment.

According to the Hawaiʻi Military Land Use Master Plan (See Figure 1), the Navy has nine leases and easements on Kauaʻi that expire between 2028 and 2030. These include an

Ocean Right of Way Lease totalling 7680 acres of ocean space, and a 1,167 acre lease on Niʻihau, as well as leaves and easements on Mahaka and Miloliʻi ridges. These leases and easements should be included in the scope of analysis.

Service	Location	Island	Acres	Exp Year	Notes
Army* (Figure A-1)	Pōhakuloa Training Area (PTA)	Hawaiʻi	22,971.0	2029	Saddleback Road Lease
	Kahuku Training Area	Oʻahu	1,150.0	2029	Parcel Lease
	Kawailoa Training Area (Poamoho)	Oʻahu	4,390.0	2029	East Wahiawā Parcel Lease
	Mākua Military Reservation (MMR)	Oʻahu	782.0	2029	Waiʻanae Parcel Lease
Navy (Figure A-2)	PMRF	Kauaʻi	391.65	2029	Main Base Leases
	PMRF	Kauaʻi	7,445.41	2029/2030	Main Base Easements
	PMRF - Offshore	Kauaʻi	7,680.0	2029	Ocean Right of Way Lease
	Kamokala Ridge	Kauaʻi	88.83	2029	Lease
	East of PMRF Main Base	Kauaʻi	0.29	2029	Water Well Lease
	Mākaha Ridge	Kauaʻi	203.1	2030	Lease
	Mākaha Ridge	Kauaʻi	42.21	2030	Easement
	Miloliʻi Ridge	Kauaʻi	0.015	2030	Lease
	PMRF Niʻihau	Niʻihau	1,167.0	2028	Test Vehicle Land Recovery Site Lease
Air Force (Figure A-3)	Kaʻena Point Satellite Tracking Station	Oʻahu	86.72	2029	Lease
	Kaʻena Point Satellite Tracking Station	Oʻahu	51.47	2029	Easement
	Kāʻala Air Force Station	Oʻahu	1.8	2028	Lease
	Kōkeʻe Air Force Station	Kauaʻi	8.45	2030	Lease
	Remote Maui Experimental Sites	Maui	6.17	2021/2023	Leases
	Maui Space Surveillance Site	Maui	5.0	2031	Lease
		Total	46,471.1		

*Army expiring easements are not included in the table as they are small in scale, routine, and not associated to the 65-year lease.

Table 1 – Expiring Leases and Easements

Land Use

The EIS should incorporate a complete history of land title and land use with maps. A central issue is the Navy and NASA's use of public trust lands (also known as "ceded lands"). The status of these lands are unique in that they are held in trust for a number of public purposes defined by the Statehood Act. The EIS should explain the decision making process, with relevant documentation, for the initial negotiation and approval of the leases and easements.

State Land Use Regulations: The EIS must analyze the land use zoning and permitting requirements.

Cultural Resources

To date, investigations into the number and significance of cultural sites have been superficial. The EIS should include a thorough inventory of the historic sites in the area, discussion of the cultural significance of Nohili and Kōkeʻe, in relation to the larger cultural landscape, and a discussion as to how the condition of these sites has changed while the Navy and NASA has used these lands. Kānaka ʻŌiwi and the general public currently only have limited access to the affected parcels, and therefore, are denied the right to fully enjoy and conduct cultural, religious, or subsistence gathering practices until the lands are cleaned up and restored.

The EIS must incorporate a comprehensive Cultural Impact Assessment (CIA). Pursuant to the Hawaiʻi Environmental Policy Act (HEPA), and Articles IX and XII of Hawaiʻi State Constitution government agencies are required "to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups" (Guide to the Implementation and Practice of the Hawaii Environmental Policy Act, 2012, 11). The CIA must include an analysis of adverse cultural impacts on Kanaka ʻŌiwi and other cultural practices by military activities at Nohili and Kōkeʻe which have occurred in the past, and which may occur in the future as a result of proposed military activities.

The DEIS must incorporate a rigorous Kapaʻakai analysis of the proposed actions, which must include,

> (1) the identity and scope of "valued cultural, historical, or natural resources" in the petition area, including the extent to which traditional and customary native Hawaiian rights are exercised in the petition area; (2) the extent to which those resources -- including traditional and customary native Hawaiian rights -- will be affected or impaired by the proposed action; and (3) the feasible action, if any, to be taken by the LUC to reasonably protect native Hawaiian rights if they are found to exist. (Ka Pa`akai O Ka`aina v. Land Use Commission, 94 Haw. 31. 2000. 36)

Cultural Landscapes: The CIA must consider the entire connected cultural landscape including ocean and mountain spaces. Hawaiʻi law recognizes that in addition to built structures, a cultural resource may also be a natural feature of the landscape, such as a mountain, hill, rock, tree, stream, or animal which has cultural significance to Kānaka ʻŌiwi. This study should include an in-depth cultural landscape study (CLS) and ethnographic survey (ES).

The Papakū Makawalu methodology, developed by the Edith Kanakaʻole Foundation, would be appropriate to employ in the assessment of the cultural meanings and significance of the affected area. Identify and discuss the significance of place names. Analyze the relationships between geographic features and moʻolelo. Analyze how contemporary cultural practices may be affected by the proposed actions.

Cultural Sites and Resources: Affected sites include, but are not limited to alanui (trails), ahu and heiau (shrines and temples), puʻu (hills), rocks, caves and lava tubes, plants and animals used in traditional healing, hunting grounds, sites for harvesting birds, sites for observation and study of celestial bodies, burial sites, quarries and workshops for tools, and sources of water. Discuss the significance of the sand dunes and wetlands. Discuss the significance of the westernmost orientation of this landscape for funerary spiritual practices.

Cultural Practices: Pursuant to the Navy's and NASA's lease agreements, easements, and legal obligations, the Navy and NASA must mālama ʻāina to restore ola (life) and create a safe and healthy environment for the well-being of flora, fauna and all interdependent life forms including the native tenants / hoa ʻāina / beneficiaries. The native tenants must include, but are not limited to: hunters, fishers, and gatherers, lāʻau lapaʻau (herbal medicine practitioners), cultural and religious/spiritual practitioners and their relationship to the ʻāina, surfers, canoe paddlers, oceangoing canoe voyagers, and hula practitioners. Adverse impacts on cultural practices include, but are not limited to restrictions on access due to security or safety restrictions, the destruction of cultural or religious sites, the destruction of environmental resources used in cultural practices, and the disruptions of the view plane and serenity of the area caused by missile launches, lasers, vehicle and aircraft noise, and smoke and dust.

Conduct a comprehensive survey of past and current Kanaka ʻŌiwi cultural practicesin the ROI. Identify the cultural sites and resources needed for the revival and/or perpetuation of these cultural practices. What steps must be taken to improve the ability of Kānaka ʻŌiwi and the public to have safe, meaningful, and regular cultural access to these areas? How will the Navy and NASA increase the opportunities for Kānaka ʻŌiwi and the public to safely participate in mālama ʻāina (environmental and cultural restoration activities) in the ROI?

Biological Resources

Native Ecosystems: The EIS must adopt an ecosystem-scale approach to analyzing the effects of the proposed military activities on the natural resources. This means studying the components, structures, and functioning of affected ecosystems. Individual species cannot be considered in isolation from their ecosystems. Nor can they be considered as separate from cultural relationships with humans. Ecosystems and species that inhabit them are also cultural resources for Kānaka ʻŌiwi.

Threatened and Endangered Species: It is imperative that all rare, threatened and or endangered organisms within the area remain protected. The EIS must incorporate a complete inventory of all rare, threatened and/or endangered plant, insect and animal species including those identified as Native Hawaiian ʻaumakua and kinolau (divine bodily manifestations of Hawaiian deities) within the ROI and neighboring areas which are likely to be affected by proposed activities. Affected species must include marine species that could be affected by military training associated with the facility.

Invasive Species: The EIS should fully disclose the extent of invasive species threats at the ROI. What is the inventory and extent of invasive species threats at Nohili and Kōkeʻe? What invasive species have been introduced or spread by military activities? For example, has the coconut rhinoceros beetle, fire ants, or other noxious weeds been detected in the base? What is the Navy and NASA doing to control these threats? Please provide any incident reports of damage to endangered species or habitats by invasive species. Please provide any incident reports of accidental releases or introductions of invasive species, such as: hitchhiking fountain grass or fireweed on vehicles or personnel or the introduction of invasive species such as fire ants, rodents, snakes, spiders, rhinoceros beetles as stowaways on cargo boats, vehicles, and aircraft.

Wildfires: The EIS must provide a complete history of wildfires at PMRF and KPGO, including the dates, causes, extent of damage, and responses. How are wildfires documented, and where is this information reported and archived? What have been the impacts on fires to protected species and habitats? What have been the impacts of fires on cultural sites and resources? How have fire incidents affected the transformation of the ecology? How are biologists and cultural resources specialists documenting the impacts of fires?

Socioeconomics / Environmental Justice

Environmental Justice Analysis: As mentioned above, the greatest environmental justice impacts will be borne by Kānaka ʻŌiwi who have the most profound connection to the lands in question. The environmental justice analysis in the EIS must not use demographic data to claim that there are negligible environmental justice impacts because all ethnic groups are considered minorities on Hawaiʻi island. The key considerations in determining environmental justice impacts include: Who has the longest history, deepest connections, and profound knowledge about Nohili and Kōkeʻe? Who has the greatest stake and is most directly affected by the environmental and cultural impacts there? Who has suffered the greatest historical injustice, cultural disintegration, and dispossession as a result of the history of the U.S.-backed overthrow of the Hawaiian Kingdom and the subsequent seizure of Hawaiian land by the federal government? Whose cultural practices are most adversely affected by Navy and NASA activities in Nohili and Kōkeʻe? Who is exposed to the greatest risk of exposure to toxins, injury, or death in the exercise of their cultural practices? How are subsistence hunters, laʻau lapaʻau practitioners, and Kanaka ʻŌiwi religious practitioners affected by the access restrictions and hazards at PMRF and KPGO?

Economic Costs: Some questions about the economic impacts of the military activities: What are the costs of clean up and restoration of environmental damage caused by military activity? What is the depreciation in the land's value as a result of military activities? How does the loss of value adversely affect the general public and Native Hawaiians as beneficiaries of the public land trust? What are the opportunity costs? What economic value can be generated by restoring the ecological and cultural integrity of Nohili and Kōkeʻe?

Noise

Noise is one of the major complaints about military activities. The EIS should include consultations with residents of neighboring communities about the effects of noise. This includes the impact of noise from overflights of aircraft. How does noise affect the value of homes? How does it affect quality of life? What public health affects might be induced by chronic noise? How are veterans' mental health affected by the noise? How does noise affect the behaviors of animals, especially endangered species?

Air Quality

The EIS must provide thorough data on air quality at PMRF. What kinds of documentation and reporting is conducted when there are incidents that may adversely affect air quality, such as a fire or training event? What emissions of air pollutants have been reported at PMRF and KPGO? What toxins or hazardous substances have been detected in airborne particulate matter during fires or training events?

Water Resources

Nohili and the Māna plain was known to be a site of abundant wetlands. How have military and associated agricultural activities in easement lands affected the wetlands of this area? What is the history and status of aquifers in the vicinity of Nohili? Where are the wells? What is the history of water usage? What has been the impact of past uses of aquifers?

Rocket propellent has been associated with perchlorate contamination in many sites in the United States. Perchlorate has been detected in Nohili. What is the status of perchlorate contamination, and what is being done to clean up this hazard and prevent its release?

Provide a comprehensive analysis of the PFAS contamination at PMRF and KPGO. Include incident reports of all releases, detections of PFAS in the water, soil, and biota, and the status of clean up efforts.

Natural Hazards, Geology, and Soils

What are the hazards due to climate change and sea level rise? What are the risks of tsunamis and hurricanes? What plans exist for preventing contamination of the environment in the event of flooding?

Climate

Provide a comprehensive audit of the fossil fuel use and carbon emissions of PMRF and KPGO from all sources, including but not limited to the emissions of offshore exercises, rocket launches, flights to and from the facility, ground transportation, and power generation.

Visual Resources

Wide open spaces and views of the mountains is part of the significance of this landscape. What are the Kanaka ʻŌiwi visual resources in the ROI? What is the cultural significance of different view planes?

Public Facilities and Infrastructure

What are the effects on the quality of roads? What are the impacts of military use of harbor facilities? How are military activities affecting recreational use of the beach, mountain, and ocean resources?

Toxic and Hazardous Substances

The EIS must include comprehensive information characterizing toxic and hazardous substances in soil, groundwater, surface water runoff, uptake in plants and animals, air emissions, marine environments and species, and air borne particulate matter. The Contaminants of Concern (COC) that should be investigated include, but are not limited to:

- Munitions and explosives of concern (MEC);
- Metals, including lead from small arms munitions, mercury, beryllium, cadmium, arsenic, copper, aluminum,
- Depleted uranium (DU), strontium 90, and other radioactive contaminants,
- PCBs, dioxins and furans,
- Energetics and explosive constituents and their byproducts,
- Per- and polyfluoroalkyl substances (PFAS) which is commonly found in fire-fighting foam,
- Percholorate, a common chemical in rocket fuels,
- Petroleum, oil, and lubricants (POLs),
- Volatile organic compounds (VOCs), including solvents, pesticides, and herbicides,
- Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) and Polycyclic Aromatic Hydrocarbons (PAHs),
- Asbestos,
- Various kinds of air pollution emissions.

Cumulative Impacts

The EIS must incorporate data and analysis of the environmental effects of all past military activities at PMRF and KPGO, including:

- A comprehensive list of all military activities ever conducted at PMRF and KPGO, including any nuclear, biological, and chemical weapons tests and military activities by other service branches and foreign militaries.
- A comprehensive study of toxic and hazardous substances and their effects on the human and natural environment.

- A description of all munitions used, the quantities used, the explosive yields, contaminants associated with these munitions, the extent of unexploded ordnance contamination, and the results of any removal actions.
- A comprehensive report on wildfires, their causes, responses, and environmental consequences.

The EIS must also take into account the combined environmental and cultural impacts of all past, present, and reasonably foreseeable future projects at or near the project area.

Provide a list of all of the public and private users of the facilities at PMRF and KPGO, including the defense aerospace contractors, U.S. and foreign entities, and University of Hawai‘i programs such as the Applied Research Laboratory.

Thank you for your attention to these comments.

Scoping Comment Letter 0056

Consent for storing submitted data
True

First Name

Last Name

Add Me to the Project Mailing List
No

Street

City

State
HI

Zip code
96822

Email

Organization/Affiliation (if any)

Comments

No consent. No continued military presence at PMRF. Please restore the land the military occupies to its natural state, return the lands to the native Hawaiian people, and leave.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0057

Consent for storing submitted data
True

First Name
Sommer

Last Name
Kauakahi

Add Me to the Project Mailing List
Yes

Street
1055 Kamalu Road

City
Kapaa

State
HI

Zip code
96745

Email
kauwela87@gmail.com

Organization/Affiliation (if any)

Comments

I support alternative 3: no action alternative. Come spring of 2025, there also needs to be much more advertising/public service announcements made to the public. Banners, radio announcements, newspapers, and social media, so the larger community can also know and be aware. One of my reasons for support in alternative 3, may fall under environmental justice. I am acutely aware of the mental stress & anxiety it gives many Kanaka Maoli, myself included, to see the illegally occupying powers that have no Treaty of Annexation illegally occupying the ceded lands of the lawful Hawaiian Nation. Not only should birds & plants be included in the EIS, but also the reef, the limu, the coral, the opihi limpets etc which are all important natural & cultural resources.

Add Attachments (optional)

Submitted on
06/17/2024

Scoping Comment Letter 0058

JOSH GREEN, M.D.
GOVERNOR

KEITH T. HAYASHI
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
KA 'OIHANA HO'ONA'AUAO
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF FACILITIES AND OPERATIONS

June 7, 2024

Ms. Kerry Wells, PMRF and KPGO RE EIS Manager
Naval Facilities Engineering Systems Command,
Hawaii Environmental OPHEV2
400 Marshall Road, Building X-11
Pearl Harbor, Hawaii 96860

Re: U.S. Navy Pacific Missile Range Facility and NASA Kokee Park
Geophysical Observatory Real Estate Environmental Impact Statement

Dear Ms. Wells:

Thank you for your letter dated April 30, 2024. Based on the information provided, the proposed project will not impact the Hawaii State Department of Education facilities.

Should you have any questions, please contact Cori China of the Facilities Development Branch, Planning Section, at (808) 784-5080 or via email at cori.china@k12.hi.us.

We appreciate the opportunity to comment.

Sincerely,

Roy Ikeda
Interim Public Works Manager
Planning Section

RI:ctc

c: Facilities Development Branch

Scoping Comment Letter 0059

Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: June 8, 2024

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

Aloha, my 'ohana and I attended one of your meetings recently, and after careful review of your shared info, I would like to add some comments. I would offer that the Navy has met with the local community in past years over RIMPAC and SONAR concerns, listened to passionate testimony from the people, but to little or no avail. The recent debacle of Red Hill has done little effect on boosting the people's confidence of the Navy's good intentions toward fostering a benevolent relationship with the community of Hawaii, although we are addressing specifically Kauai at the moment. I have tremendous respect for our Military outside of the operations of the Military Industrial Complex.

(over)

Please provide your mailing address to receive future notifications about the project.

1. Name: S. Strom
2. Organization/Affiliation (if applicable):
3. Mailing Address: susiwailua@gmail.com / Kauai, HI 96766

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

Please turn in this form at a public scoping meeting, submit online at PMRF-KPGO-EIS.com, send by email to info@PMRF-KPGO-EIS.com or mail to:

Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

** Please Print Clearly **

which we all hope is not operating in continuity, but rather an honest, transparent Military which serves and protects its citizens and environment first and foremost, instead of 'forever wars' and invasions.

NASA has tainted itself with deception, and has become an endless vacuum of our tax dollars, with little to show for its gargantuan costs, and zero contribution toward the betterment of humanity. What NASA does now, Space Force and Starlink can do better. Therefore, I am making the following recommendations:

(1) The possible renewal of Navy Lease lands reduced to the 410 acres in actual use only, and with stipulations that require the Navy to expand their role and duties to: (A) Utilize an alotted time schedule to provide for humanitarian services to the public, such as: Infrastructure assistance, re-generation assistance with lands and expansion of permanent housing facilities, agriculture, and garden communities to those in dire need of generational homes, clean water, Energy installation, and other purposes which lend strength, overall Health, and continuity of the local communities, among other seafaring, protective duties including (B) Assisting with organic regeneration activities of our ocean, waters, marine life, beaches, etc.

(2) NASA transfer its technologic infrastructure over to the oversight of Space Force, and phase out NASA's presence here on Kauai completely.

It is my recommendation that NASA's lease be NOT renewed, and Alternative 3: No Action Alternative be administered.

Mahalo for your outreach, and enabling us to respond to your projections.

Respectfully,

S. Strom & Ohana
Kauai, HI 96766

YOUR INPUT MATTERS
Visit PMRF-KPGO-EIS.com

Scan QR code for project website

Scoping Comment Letter 0060

Commenter Name: Susan Strom

Comment: This is Susan Strom. I live on the island of Kaua'i, and I just wish to share my concerns about the renewal of a lease for NASA, in particular, and this being that NASA has a sordid history of Nazi infiltration in its genesis. And there has been very little that has been done over these many years since NASA's beginning -- NASA's beginning that benefits humanity in any way. We have been, as citizens, funding this organization for many, many years. And the money seems to appear to just disappear down a black hole. I have not seen with NASA's existence here in Kaua'i any real benefit to help uplift humanity and help humanity here, but we've all been funding it without our own consent. So I don't feel that its lease is something that should be considered for renewal at this time. Thank you.

Scoping Comment Letter 0061

Commenter Name: Alice Parker

Comment: Okay. Alice Parker, Lihue. Okay. Ready? I'm concerned about the education of the staff's children. The schools here are not very good, I feel. So how are they going to augment the inadequacies of our local schools? Okay. That's it. Thank you so much.

Scoping Comment Letter 0062

Commenter Name: Lana Bilbo

Comment: I'm Lana Bilbo. And then just go? Okay. So I support the no-action alternative. The concerns that I have include the fact that this EIS is not going to take into consideration the environmental impacts in the ocean, which seems really crucial. I know that you guys have a separate EIS for that. But kind of artificially breaking these, like this lease is to support the base, which is doing those things. And it seems like a really artificial way of breaking them up so that you don't have to consider it for this part of the process, which I don't think is right. I think that the lease should very much be available to the public to review. I noticed that you guys only said the words fair market value one time in this entire thing, and it's not written on any of the boards. It kind of seems like you're trying to hide the fact that the previous lease was only for a dollar. Doesn't seem cool. I noticed that the way that we're able to provide testimony for this is that we have, like, a room in the corner, and we're being recorded and that we don't have an opportunity to engage as the public with each other, as well as with this process. And I think that that is a very obvious strategic ploy that is also used by developers in this county to sort of minimize and isolate the pushback on projects, and it's pretty obvious. And I'm kind of confused how the cultural impact assessment was initiated in November, but isn't really -- I'm confused how those two things are tied together and especially how no one that I know in the Hawaiian community knows about that or has been consulted. Like, they just found out about this EIS through, honestly, me texting them about it. And so if that process started in November, I'm really confused as to why none of the cultural groups that I work with are aware of that process. And I would say that for now, that's most of my comments. Oh. And I hope that these comments will be made available to the public for review so that we can see what each other are saying, since you've set up this process so that we can't talk to each other. So I hope that the comments will be made available to everybody to look at during this process so that we're not intentionally siloed. Thank you so much.

Scoping Comment Letter 0063

Commenter Name: Wesley Yadao

Comment: Okay. My name is Wesley Yadao. I just want PMRF to open more fishing areas to the public, so that it's all about cultural practices that we need. That's about it. That's about it, just opening more fishing areas to the public. That's all I have for now.

Scoping Comment Letter 0064

Commenter Name: Punohu Kekauala III

Comment: My name is Punohu Kekaulua III, and then just go with my -- this is my comment or testimony. The state lands are crown lands belonging to the chiefs via Great Mahele, which were superior land titles, allodial, that belonged to our ancestors, giving Kanaka an undivided shared interest to the lands. In alternative one, they're asking to lease the lands, release them from the State of Hawaii or DLNR. But they have yet to prove these crown lands belong to them to be able to lease them out. Alternative two, where they're possibly thinking about purchasing the land, the Navy wants to purchase, this should be impossible for Navy to buy state or crown lands because the state can't sell something that does not belong to them. And alternative three, to avoid court cases or community uproar, the Navy should be asking descendants of Victoria Kamamalu, who has a title to the property, to lease it, if they want to do it legally from the true owners of the property. The treaty of annexation has yet to be presented as evidence to prove that Hawaii is the 50th state of America. Without it, the Country and Kingdom of Hawaii are still in existence. Kanaka Maoli, or Hawaiian nationals, have a vested right to their country and its lands through -- through birth. With no treaty of annexation, why is the U.S. Navy here? We are an occupation, so the Navy should change the state to a military government and help with the reconciliation process to give our Kanaka back their rights to self-determination and their private properties. Help hold the fake state and Ag Department accountable for poisoning our precious land and resources. We -- for us Hawaiian nationals, we understand that American citizenship is a voluntary right, not mandatory. So with that being said, administer the law of this land, the kingdom land -- or kingdom law, sorry.

Scoping Comment Letter 0065

Commenter Name: Jose Felix-Keamoai

Comment: My name is Jose Felix-Keamoai. I'm a resident of Kekaha here on the Island of Kauai. I'm also an employee, one of the contractors, for PMRF. Contractor name is Koa Lani JV, LLC. We're also involved in the community of Kekaha in youth sports. Organization is Pop Warner Football and Cheer for Kekaha. Hearing the voice of some of family or friends in the community, knowing that I work at the base at PMRF, they always ask: How do you get access to -- to the beach, which would include fishing -- fishing size, fishing grounds? And I believe there's maybe two options that they have. So the question or request would be, what I'm hearing from the community is: Can they open more fishing access at PMRF? Through an MWR permit would be probably the only way that you can access it. Before 9/11, there was beach access all the way through from Kekaha Beach all the way through to Polihale. There was no barriers. People were allowed to fish, walk all the way through and camp, but now they're not -- but now they're not able to camp or fish. Again, only two options. So again, the question or suggestion is to open up more sites to allow non-PMRF workers to be able to have access to the beach, and of course, including water sports, surfing, and -- and scuba diving. Another concern or -- that I hear from the community is questioning if -- if we would one day become a responsive base. And the only reason for that is once we become a responsive base, pretty much we would be considered a target. And the concern with the people is that we're going to get basically attacked on this side of the island. So is there any plans to not only make PMRF a testing facility, but a response active facility? And if it does become a -- a response facility, what contingencies -- plans are there to safeguard the community? I want to add and -- and actually just give testimony to in the past, personnel at the base have been very helpful when it comes to natural disasters by using or utilizing the -- the flight line and bringing in supplies. So another question would be: Will PMRF continue to allow to open the runway for national emergencies to bring in supplies, as needed? One more question. Knowing that capabilities or technology is advancing and new developments arise every day, what new developments are in the horizon to expand our -- our technological advancements or keep up with our technological advancements? Or any new radars or technology, when they do become available to this site, will there be the same communication to allow people to be acknowledged and have testimony to concerns or questions? And that's all my questions. Thank you very much.

Scoping Comment Letter 0066

Comment Name: Nākaiʻelua Villatora

Comment: ʻO Nātaiʻelua Villatora koʻu inoa. No ka mokupuni o Kauaʻi, ahupuaʻa o Kalapaki, moku o Puna. Noho au ma ka ahupuaʻa o Pōkiʻikauna ma ka moku o Kona. Ke nīnau aku nei wau, pehea aku nei i kēia wahi aupuni o Hawaiʻi, e ai aku i ka hoʻohana ana i kēia mau ʻāina a me ke kumu waiwai ma Kauaʻi nei e pili ana ka military, ka Navy a me NASA. He noi e aʻe, e ano noi haʻahaʻa e hoʻokoaʻe ai a laila. Haʻawi aku ai i nā palapala, hōʻike aku ai i ka palapala i na hoʻoilina nō ka ano ai like ma waena o ka Navy a me NASA me ke aupuni o Hawaiʻi. E hoʻohānai a hoʻohōʻai i ko lākou hoʻohana ana i kā ʻāina. Mahalo nui, mahalo. Okay. So I'm going to switch over to English so you can type. My name is Nākai'elua Villatora, and I am from the island of Kauai from the Ahupua'a of Kalapaki and the Moku of Puna. But I currently reside at the Ahupua'a of Pōkiʻikauna in the Moku of Kona. My testimony would be asking about the original deeds and documents that the Navy and NASA has with the state, and is that provided for a public viewing? Also, would like to -- or would like -- would like to find the -- the documentation of the data of natural resources utilized by the Navy, military, and NASA, for instance, like the punawai spring water resources, any other natural resources, like pertaining to rock formation or any boulders, and then also, like, more in-depth details of what they utilize in the said property. Another thing that I would like to able to express is how much of the -- I -- I understand, like, they are promoting readiness for the military. And what is that readiness? What details is that readiness about? Like, I want to be able to know, like, what type of -- may be -- how I was, like --I'm, like spacing out on what I was going to say? Kalamai. What are -- what are you trying to be ready for, you know, the type of war, etc.? And then. also, what are the benefits of the kaiaulu, or community, here on Kauai? What are the benefits for us, besides this whole protection of ourselves, you know, from -- from unseen forces? And then also -- I was, like, shoot. Where's my paper. Another thing, I just would like to be able to see more -- more information data on paper, where -- for people to provide. Mahalo.

Scoping Comment Letter 0067

Commenter Name: Roslyn Cummings

Comment: Aloha nō, koʻu inoa Roslyn Cummings Manawaiakea, noho au Kalaheo ahupuaʻa, Kona moku, Kauaʻi mokupuni. So I reside in the Kona moku (district), in the Kalaheo Ahupua'a of the Kauai Island in Hawaii. So this is my oral testimony in regards to the Navy and NASA's proposal today. What is the date? May 5th of 2024 oh. Why did I say May? Okay. June 25th (sic) of 2024. Okay. So here's my ʻike ʻoiaʻiʻ, my truth, my knowledge of truth. When water traverses from mauka in our in our forests, and it traverses -- whether underground or above ground, it picks up the nutrients that is needed by everything that surrounds it in its the environment, whether it's the Maoli manu, which is the native birds, or the (indiscernible), the native plants. So when water gets diverted, whether it's mauka or makai, on the shorelines, it affects that Kauai cycle. So one of my greatest concerns with any type of project is to know what the water qualities are, what the water usage is, contaminations. And knowing that the Navy has a history with not good practices here in Hawaii, Kaho'olawe, for instance, Niihau, depletion of water tables. I grew up here on Kauai. My family's actually from here. We were the last family to live in Nu'alolo in Napali. We grew up in Polihale. During the summers, we'd sit -- we'd spend months in the summers there. And so back -- I was born in the '80s. So back in the day, up until the '90s and the early 2000s, we were able to gather punawai, which is spring water. We would drink spring water, which is no longer accessible. So we don't know exactly what's happening with the water. And these are all within that Navy zone -- what -- what is it called? Easement. Within the navy's easement zone. As far as NASA, though, my concerns for NASA is there was a point in time where there was a water quality testing that happened in Miloli'i, M-I-L-O-L-I-I, Miloli'i. This is a secluded area on the Napali coast. That testing got to UH, but it never became public. And within that testing, there was a high levels of contaminant. The component was iron, and it wasn't a natural iron. So my question is: Is there something that's happening up in that area in NASA and the Navy that they're -- they're leasing those lands from the state, is it affecting something below? Is there some kind of natural waterway, there's something seeping from their -- their building? From whatever they're doing up there, is it seeping down into the ground and coming out into that particular area in the reef area that's causing the contaminant to cause a flesh-eating bacteria? Another thing is ancestral burials, iwi kupuna. There's a law -- it's a kingdom law, actually, it's an older law -- and it talks about the law of the sepulcher. And sepulcher, in English terms, is basically graves or burials. And so with this law, it basically protects burials. So whenever we have any kind of disturbances, we have an issue here in Hawaii, where archaeologists come out and have a tendency to remove burials. That's technically desecration in our culture. And regardless of the proper protocols, we need to realize that there's something in our culture called wai wai. Wai wai is a word that you can use for natural resources. Wai wai is a word that you can use for wealth. Wai wai is a word that you can use for imprint. Wai wai is pretty much what bases our sustenance. It's what Kanaka Maoli nā kanaka rely on. And 'aina is everything that we consume. It's part of what we consume. That's 'aina. It doesn't limit to wai or kai. 'Aina is everything that we can consume. So we really need to take into consideration that these practices that we're accustomed to might be more of a haole, foreign, concept versus a Maoli, a native concept, and start to respect these boundaries that our ancestors -- there's this huge gap between what we know now and what our ancestors knew then, and we need to take into that policy and that reverence and respect of what is naturally there. Another thing is that we have to think about the mo'omeheu, which is cultural

practices. Mo'omeheu is a cultural practice that we carry from mauka to makai, so you're talking about mea ho'olako, which are providers. We also have hahai holoholona which are hunters. And the reason why we stay away from the English terminology is because they're all coded in commerce laws, so we utilize our language, by law, it's our right to utilize. And going back to natural, basic human rights, which is written in the Constitution, which the Navy has to abide by any treaties that are being made in any nation -- right -- nation-to-nation tradition treaties within the state, which is where we're in, we're within Hawaii. So going back to these practices, you have the fishermen, you have the lo'i. These are basically what they consider wetlands. There's all these practices within this ecosystem that we call 'aina, and we call it kuleana. And kuleana is respect and responsibility. So we need to take into that acknowledgement that if we had 100 people in one room, each and every one of us would have a kuleana, and they're all going to be different. And we have to come to that concept that we're all equally doing our kuleana. So I want to, you know, acknowledge that. So mahalo for your time, and I hope this helps.

Scoping Comment Letter 0068

Commenter Name: Christopher Ka'iakapu

Comment: My name is Christopher Lono Ka'iakapu of West Kauai, a generational descendant of West Kauai, a Native Hawaiian. And I would like to testify in support of alternative number three, the no-action alternative. And this is because I believe that the U.S. military presence at PMRF, no matter how much the studies try to do, mitigation measures they try to take, they will only continue to cause destruction of the environment or natural resources in our community. The entire nearby PMRF operation only exists because they create an artificial environment by the destruction of the Mana Plains wetlands in Hawaii's -- what was once Hawaii's largest ephemeral wetlands. And so they -- they create this artificial environment for the operation to exist, thereby creating critically endangered species. These wetland birds and these other great endangered species in the Mana Plains ecosystem would not be critically endangered if it were not for the habitat destruction caused by PMRF operations and the sugar cane industry. They maintain a pump system to pump down the water table and divert natural flood plains so that their --their operation can exist. So I find it very ironic that they're claiming to want to protect critically endangered species when their whole operation is the only reason that these species are -- their whole operation is the only reason that these species are critically engaged in the first place. They also make no mention of studying or examining near-shore marine species, such as opihi and limu, which are bottom of the food chain. All the microorganisms are bottom of the food chain resources for our greater fishery. And because the operation is right on the shore, I believe that they should be doing that sort of study. And I -- I don't believe that the Navy will be good stewards. I don't think they have a track record in Hawaii. The entire U.S. military has been a part of the insurrection and overthrow since 1893. And they have bombed Kaho'olawe. They have destroyed Pohakuloa. They have destroyed Makua Valley on Oahu. They have poisoned Red Hill on Oahu. They have destroyed Hawaii's largest, potentially the world's largest, fish pond system of Honolulu to create Pearl Harbor. They have instigated and drawn the Japanese bombing of Pearl Harbor. And they've destroyed the --- the wetlands of Mana. And now they are restricting access not for only Native Hawaiians but all residents on Kauai to what -- what once was some of the most productive fishery on the west side of Kauai. I don't believe that the State of Hawaii has the legal right to even be leasing these lands.

The State of Hawaii is a fraudulent organization that is upheld by the U.S., the United States. And rightfully, these -- the lands that are proposed to be leased to the United States Military and Navy is -- is actually Hawaiian Kingdom ceded lands, crown lands, that is rightfully a part of the Hawaiian Nation. And so for the State of Hawaii to claim authority to lease out these lands is illegitimate and illegal according to international law. Yeah, I -- I oppose -- I oppose them renewing its lease. I -- I oppose the U.S. Military being in Hawaii. If they cared about our environmental and -- and cultural resources, then they would -- they would leave. They would go back home and leave us in peace, a peaceful Hawaiian nation, like we're -- we ought to be. I find it very -- I don't know -- telling and insulting that just about of the representatives here, there's probably as much PMRF staff here as there is community, and they are all not of Hawaii. They're all foreigners. So obviously, their interest is not in the best interests of our 'aina and our people. To me, it's just a symbol of continued colonization, and this is not what I want to support in my community. It's not what I think we should be supporting on a global scale. And this is -- this is just upholding the genocidal war machine of the U.S. Military industrial complex. Yeah. They should not renew the lease, and they should leave

Hawaii in peace and stop pretending like they -- they are really going to study and care about our -- our environment and our biological and cultural resources. Thank you.

Scoping Comment Letter 0069

Commenter Name: Gordon Wilson-Naranjo

Comment: My name is Gordon Willson-Naranjo. I am in support of the Navy lease because I recognize the importance of defense. And I understand that the impacts, while unfortunate, are a necessary evil. I appreciate the stewardship that the Navy has done on Kauai specifically. I believe the REPI Program is an exceptional means of providing DOD money for conservation and partnership. And I think that if the Navy were to leave Kauai, there would be an impact to the economics, as many folks on the west side specifically rely on the base for their income. That's it.

Scoping Comment Letter 0070

Commenter Name: Peleke Flores

Comment: Aloha. My name is Peleke Flores from Waimea. Yeah. Just give you mytestimony or comments for this meeting. Guess my first comment for the meeting is I believe the meeting should be advertised better, like the front page of our local newspaper, versus a little slot in the back. Our local news, social media, state and county websites in the front page, and all our Kauai known -- Kauai-based known NHOs, or Native Hawaiian organizations. I know there's a list out there, but to be able to email everybody about this meeting would help have better due diligence, I guess. There are more -- it seems to me there are more staff members here and partners than community members. And then -- yeah. Doing more better historical research of Mana, Mana's aquaculture would be good, beyond the plantation period and looking at Hawaiian literature that talks about the space and transcribing it. Also, within this process, if we were to go through -- or if the lease is expanded, the -- the area, the agriculture area, should be designated for community use, not big corporations, seed companies, or GMO companies, stuff like -- they should work with NHOs or 'aina-based organizations to restore the place to a semi-functional fish pond, as it once was, and bring back the floating lo'is of Mana. And also, would like to a map or stats data looking at our service, the U.S. service members, how much lives on the base and how much rents outside of the base and how that affects or displaces our local community with higher rent and/or just spaces to live at. I would like to see that stats. And I think for now that's all I got. I'm still going to do more research, and also with -- with all these resources and partners helping pull this EIS together, they should have the resources to reach out better than how they're reaching out now. Also, with the NEPA process and the new addition, the new update to the NEPA process of consulting indigenous knowledge to help guide this Section 106 in the EIS process. Mahalo.

Scoping Comment Letter 0071

Commenter Name: Mike Long

Comment: My name is Mike Long. I live in Kauai for about 12 years. I talked to the commander, and most of the questions I asked, he had no answer for. He doesn't know what the budget was for last year. What kind of commander doesn't know what his budget is? It seems either -- I don't know -- false or not smart. I mean, he's got to know -- he -- he totally blew it off. And I know, like, several years ago, it was, like, $6 billion, and their rent they were paying was $1 a year. So the military gets everything, and Kauai gets nothing. And he says they're going to renegotiate, and it's going to be millions this time. And we don't know who's negotiating for Kauai. In the military industrial complex, they fund politicians, and the politicians are going to be the ones negotiating on our behalf. And I don't feel like we will get a fair shake out of that. And he said it would be -- it would be market value for the next -- next lease. And the market value for that base would be no telling how many billions of dollars. No way they're going to play market value. And one other question I asked is what if we don't renew the lease? Didn't have a good answer for that one, either. And I don't like the fact that they're not wearing their uniforms. They're trying to be friendly. But if you're representing the military, if you're a commander, I'd be wearing my full commander outfit, wouldn't you? So I asked about giving comments, and he said: Oh, you have to do this. And I wanted to ask questions and make them answer my questions in front of everybody, because they didn't answer me. But they've already headed that off with a pass. So this is not a really good informative meeting. It's a presentation with a lot of nebulous terms that nobody's going to understand. And not knowing their budget for last year seems like a pretty big red flag to me. I hope our representatives do better than I think they're going to do, but I don't know. And according to the environmental study, everything they do harms the environment here. I mean, they're a military organization. They drop bombs in the water. They use sonar that affects the whales. And they say -- oh, they try to mitigate that. If there's whales around, they don't use the sonars, whatever. You know that's not true. They do what they're going to do no matter what. And we didn't even get to the part about all their tests are scripted. They spend billions of dollars a year, and they couldn't shoot down an enemy rocket if our lives depend on it, and they do. They -- all the tests are rigged so it looks like they're doing something good, and they're spending billions of dollars to do it. It just seems like a tremendous waste of money to me, and it has negative impact on Hawai'i. I don't think we should renew their lease at all, and I think they would have a big panic attack if we threatened to do that. So that's my comments. I hope it helps the people of Hawai'i. Thank you for your time. So how'd I do?

Scoping Comment Letter 0072

Commenter Name: Darlyne Mcleod

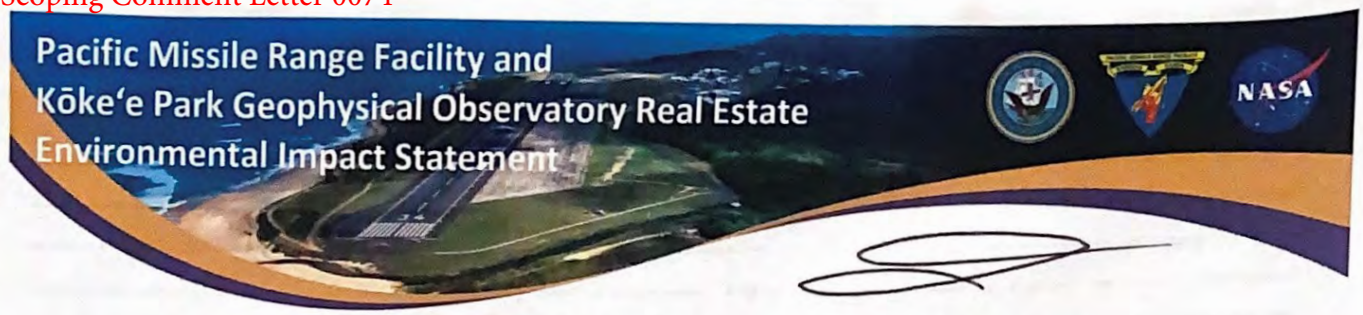
Comment: So my name is Darlyne McLeod, and I was thinking that a wonderful idea would be should we go with the alternative where the base/PMRF and NASA buy the land outright for fair market value, that some percentage of that money that would be made from that sale be applied towards affordable housing for the Island of Kauai, so that basically some of that money would be able to go back into the community and there'd be a direct benefit to this sale.

Scoping Comment Letter 0073

Commenter Name: Sherri Cummings

Comment: My name is Sherri Cummings and I am a DHHL waitlister, Department of Hawaiian Home Land Trust 1920 Rehabilitation Act federal program. My concerns that I have is the ability to actually be part of the stakeholders who would have some type of benefit returned to them. Majority of our agriculture lands is on the west side of the Island of Kauai, and they are part of the lands that I believe could have some benefits regarding water transmission lines and nopportunities for us to be placed on lands that is being held in trust for us. And I think we should have beneficiary consultation to support the efforts of the Department of Hawaiian Home Land placing us on ag awards. The last ag award was in the year 1985. their leases and were promised tohave re-awarded leases, and that never happened. Four families died without being placed on the list. And there's only one family today that has what we would consider insufficient water source for what he does on DHHL's lands. So that is my primary concern. And the reason why we don't have these ag awards words is basically the lands are -- were deemed lands that could not be farmable or have pastoral opportunities, because of lack of water. There were five families that were awarded in the early 1960s, and four families gave back and that never happened. Four families died without being placed on the list. And there's only one family today that has what we would consider insufficient water source for what he does on DHHL's lands. So that is my primary concern. I have other concerns regarding, you know, Niihau ohana having opportunities to have infrastructure to support themselves regarding water and electricity. And the Hawaiian families that was relocated from Niihau to Kauai, and they have the opportunities, as well, to have some sort of repatriation, for lack of better word, regarding how they were removed from their lands, my family's included. My mother's great-grandmother left the island, the first wave of native Niihau people. Her name was Kahinawe Keo, and she came with her mother, Ho'a'a, and her father Wahinealoha Keo. And so just trying to see if there's opportunities where Niihau people can benefit from what is happening on the -- the west end. And I think, you know, in all honesty, the DHHL beneficiaries should be at the priority, because we are actually still held by the federal government in a program that was -- that was passed congressionally in the year 1920 by our Prince Jonah Kuhio Kalanianaole. And as a condition of statehood, that rehabilitation act came with being a condition as a federal compact. So I -- I feel that for all intents and purposes, DHHL beneficiaries should be at the table in all decision making moving forward. Thank you.

Scoping Comment Letter 0074



Public Scoping Meeting Comment Form

Date: June 4, 2024

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

1- We definitely need to ensure a strong presence here on this westernmost outpost of the USA to deter potential armed incursions here with their object of attacking the USA.

2. Consider the local importance of our major garbage dump (Mount Trashmore, as some of us call it) — this will soon reach its mandated utmost height of 27 ft (I believe by 2030 or so) and this is a major consideration for Navy & NASA when planning future expansions.

3) Thank you, mahalo, for this opportunity to enact with our residents

Please provide your mailing address to receive future notifications about the project.

1. Name: Alice C. Parker
2. Organization/Affiliation (if applicable):
3. Mailing Address: 3120 Jerves ST, D-2, Lihue, HI 96766-1184

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

Please turn in this form at a public scoping meeting, submit online at PMRF-KPGO-EIS.com, send by email to info@PMRF-KPGO-EIS.com or mail to:

Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0075

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6/3/24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
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- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

KAUAI DESPARATELY NEEDS A NEW LOCATION FOR A LANDFILL. APARENTLY NO LOCATION CAN BE FOUND. DO YOU NEED ALL THE EASMENT LAND OR COULD YOU CONSIDER PART OF THAT LAND BE SET ASIDE FOR A NEW LANDFILL? THIS IS A PROJECT WITH GREAT BENEFITS FOR PMRF AS WELL AS THE CIVILIAN POPULATION OF THE ISLAND. THANK YOU FOR CONSIDERING THE IDEA

Please provide your mailing address to receive future notifications about the project.

1. Name: SANDY PHILLIPS
2. Organization/Affiliation (if applicable): RETIRED
3. Mailing Address: 3120 JERVES ST, APT B-1 LIHUE, KAUAI 96766

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0076

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6/5/24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

I support option #3. Not renew military contract. There does not appear to be enough evidence to support the impact the military is having on our ocean! I do not mind the military on the land if just that the land is the bases for the onset of horrific devestation to our ocean with war games and military ocean practices.
I do not like NASA land negotion intertwined with the Navy. I support Nasa to maintain their contract

Please provide your mailing address to receive future notifications about the project.

1. Name:
2. Organization/Affiliation (if applicable):
3. Mailing Address:

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0077

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6/5/2024

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- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

Amazing new developments! I wanted to show my support and learn more.

Please provide your mailing address to receive future notifications about the project.

1. Name: Malcolm Pryor
2. Organization/Affiliation (if applicable): Resident Kekaha, HI
3. Mailing Address: 8264 Elepaio Rd B Kekaha, HI 96752

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0078

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6/9/24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

KOKE'E NASA LAND USE AREA HAS KAUAI COUNTY LABELED ~~VEHICLES~~ VEHICLES THAT APPEAR ABANDONED. WILL THOSE ITEMS BE REMOVED PRIOR TO LEASE RE-NEWAL

Please provide your mailing address to receive future notifications about the project.

1. Name: MATT SNEED
2. Organization/Affiliation (if applicable): PMRF
3. Mailing Address: ACADEMYBOY@HOTMAIL.COM

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0079

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6-5-24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

- Provide Original Deed or Agreement (Document with the State to "obtain" lease.
- Under what laws does NASA & NAVY operate under?
- Concern for another 65 year lease of mismanagement and utilization of natural resources 'āina, wai / punawai, pōhaku etc.
- What benefits to the kaiāulu does these renewal of the leases provide?
- Does the military recognize ke kanawai o Kō Pae Āina Hawai'i?

Please provide your mailing address to receive future notifications about the project.

1. Name: Nākai'elua Villatora hobilina
2. Organization/Affiliation (if applicable): E Ola Kākou Hawai'i
3. Mailing Address: 3-2600 Kaumualii Hwy STE 1300 #527

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0080

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 5 June 2024

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

FYI -
Many Peoples in Kekaha have No Vehicles
and we would like to have re-cycle
Bins that we could walk to --
in areas that Would Not bother Residents
... yes - we/I have e mailed Mel RAPOZA

Please provide your mailing address to receive future notifications about the project.

1. Name: Mary A. Hannah
2. Organization/Affiliation (if applicable): _____
3. Mailing Address: P.O. Box 1095 Kekaha HI 96752

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400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0081

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: 6/06/24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

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- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

Growing up on Kauai we had many opportunities to enjoy the beach with free access. (behind pmrf magnum etc), now its restricted (because bin-laden). I understand PMRF gives access with a screening process but what the point! Nothing has ever happened to the base were not at war why can't the locals enjoy the beach free and clear. I grew up diving on the beach with my family fishing, surfing, enjoying the beach that YOU Dont Own. By limiting our access you are restricting limiting our access to our cultural resources and taking away from our Keiki that should beable to enjoy and learn from their Kapuna Please open up free access remove the poles on the sand IF WE CAN't own the beach YOU CAN't Either.

Please provide your mailing address to receive future notifications about the project.

1. Name: Kainoa Nakazawa
2. Organization/Affiliation (if applicable): Surfer / Fisherman
3. Mailing Address:

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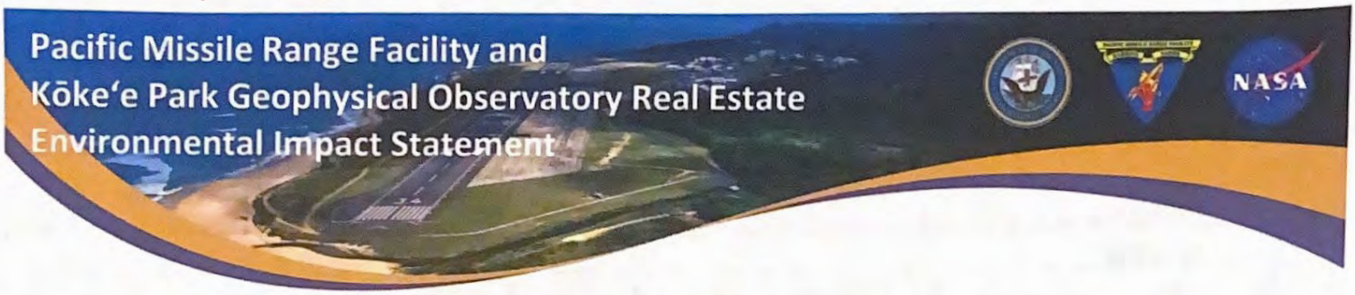
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Scoping Comment Letter 0082



Public Scoping Meeting Comment Form

Date: 6/6/24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

1. This land is ~~not~~ being used to support the activities of the base, which is training ~~AGA~~ with Rockets, missles ~~and~~ bombs. The impacts of the supported activities should be part of this EIS.
2. The EIS should consider a 4th alternative: the restoration of the Mana plains ~~lands~~ to wetlands + cultural practice areas. The base is what prevents this. There used to be a huge loko i'a.
3. Advertising for this event was inadequate. There were more NAVY staff than community members at all 3 events.
4. The federally recognized Native Hawaiian Organizations (NHOs) need to be consulted as part of the section 106. This should be discussed openly at meetings. It was not first in the two.
5. Traditional gathering rights need to be respected without needing to show "state" ID or being grahted a permit or being

Please provide your mailing address to receive future notifications about the project.

1. Name: LANA BILBO
2. Organization/Affiliation (if applicable): _____
3. Mailing Address: 5876 AHAKEA ST., 96746

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Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

** Please Print Clearly **

followed around on base.

6. The leases should be in your info packet for community review.
7. Displacement of people born in Hawaii should be considered,
8. The unfair $1 lease should be backpaid, in addition to market value moving forward.
9. ~~The public should be~~ any agriculture + work + conservation done on the Mānā plain should restore the wai, the native wetland ecosystem, and be done via NHOs, to rectify the ongoing environment injustice the base perpetuates.
10. The public should have the opportunity + space to talk as a hui at these meetings so we can hear eachothers concerns.
11. The psychological impact of the bases presence should be considered + studied. It is a physical reminder of the illegal occupation of the Hawaiian Islands. It is also being used to train genocidal militaries, including the Israeli Defense Forces. This has a disproportionate impact on the psychology of Hawaiian kanaka 'oiwi and Hawaiian Nationals.
12. If the agriculture on the mānā plain is using pesticides + heavy chemicals with studied or suspected health impacts, that has a disproportionate impact on Kekaha + the west side, which ~~is mostly~~ has a high concentration of minorities in the community. These activities on these easements should not harm our community via the above.
13. The cultural practices that we can't do because of the ongoing water diversion to the wetland need to be considered. This includes, not limited to, paddling canoes, in the wetland, working lo'i + harvesting from it, sustaining + being sustained by the loko i'a, the impacts of removing that habitat for the native birds, hular, oli, prayer, etc. etc.
14. A clear explanation of the facilities on Ni'ihau + their relationship to this project should be provided, ~~if they are not part of this lease renewal process~~
15. Should have independant 3rd party testing of all sites that have poison, toxic, polluting or contaminating materials or actions that are disclosed directly to the public w/o the NAVY as intermediary.

YOUR INPUT MATTERS
Visit PMRF-KPGO-EIS.com

Scan QR code for project website

Scoping Comment Letter 0083

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: July 5th '24

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

1. Please address the needs of DHHL Beneficiaries and have benefit consultation w/ those associations of the Department of Hawaiian Homelands as well as the Waitlist Association and NHO's that support the beneficiaries of the federal mandated Program 1920 Hawaiian Homes Commission Act.

2. Speak to Native Hawaiian Hiohau beneficiaries and have beneficiary consultation w/ them as well.

Please provide your mailing address to receive future notifications about the project.

1. Name: Sherri Cummings
2. Organization/Affiliation (if applicable): Malama Anahola, Kiko'o Kaua.
3. Mailing Address: 2878 Pikake St. Lihue, Kauai, Hawaii, 96766

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Pearl Harbor, HI 96860

Scoping Comment Letter 0084

Pacific Missile Range Facility and
Kōke'e Park Geophysical Observatory Real Estate
Environmental Impact Statement

Public Scoping Meeting Comment Form

Date: _____

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

** Please Print Clearly ** Additional Space is Provided on Back **

Bird interaction or distraction @ Koke'e.

Please provide your mailing address to receive future notifications about the project.

1. Name: Karen Ono
2. Organization/Affiliation (if applicable): BLNR
3. Mailing Address: karenono@gmail.com (808) 482-1200

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

Please turn in this form at a public scoping meeting, submit online at PMRF-KPGO-EIS.com, send by email to info@PMRF-KPGO-EIS.com or mail to:

Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

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Navy and NASA Letters in Response to Agency Scoping Comments

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DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear State of Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kaua‘i. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth’s rotation and local land motion, at KPGO.

Proactive communication with the public throughout the EIS process is a high priority for the Navy and NASA. The comments and insights provided during the scoping process are valuable in refining the proposed action, alternatives, approach to analysis, and in assessing the potential environmental impacts of the proposed action. The Scoping Summary Report is available on the EIS website here: https://pmrf-kpgo-eis.com/documents/. The Scoping Summary Report summarizes public involvement and stakeholder outreach activities for the scoping period.

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Mahalo nui loa for your engagement and participation in the scoping process. The Navy and NASA look forward to continued collaboration as we advance through the EIS process. Should you have any further questions or require additional information, please do not hesitate to contact our team.

For more information, please visit the project website at **PMRF- KPGO-EIS.com**. If you would like to request a briefing with our Navy and NASA team, please contact the Navy NEPA Project Manager, Ms. Kerry Kylene Ling at **(808) 349-0929** or **Kerry.K.Wells.civ@us.navy.mil** or the NASA Goddard Center NEPA Project Manager, Ms. Shari Miller at **(757) 824-2327** or **Shari.A.Miller@nasa.gov**.

Thank you for your interest in the project.

Sincerely,

Kerry Kylene Ling (*formerly Wells – recent name change*)
NEPA Project Manager
Naval Facilities Engineering Systems Command, Hawai‘i

Sincerely,

Shari Miller
NEPA Project Manager
NASA Goddard Space Flight Center

Distribution:
State of Hawai‘i Department of Health, Clean Water Branch
State of Hawai‘i Office of Planning and Sustainable Development
State of Hawai‘i Office of Hawaiian Affairs
State of Hawai‘i Department of Land and Natural Resources, Land Division
State of Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources
United States Environmental Protection Agency, Region 9

DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear State of Hawai‘i Department of Land and Natural Resources, Land Division:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kaua‘i. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth’s rotation and local land motion, at KPGO.

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State of Hawai‘i Office of Hawaiian Affairs
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State of Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources
United States Environmental Protection Agency, Region 9

DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear Reef Migita - State of Hawai‘i Department of Health, Clean Water Branch:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kaua‘i. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth’s rotation and local land motion, at KPGO.

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State of Hawai‘i Office of Hawaiian Affairs
State of Hawai‘i Department of Land and Natural Resources, Land Division
State of Hawai‘i Department of Land and Natural Resources, Division of Aquatic Resources
United States Environmental Protection Agency, Region 9

DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear United States Environmental Protection Agency, Region 9:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kauaʻi. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth's rotation and local land motion, at KPGO.

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DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear State of Hawai‘i Office of Hawaiian Affairs:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kaua‘i. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth’s rotation and local land motion, at KPGO.

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DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

August 30, 2024

Dear State of Hawai‘i Office of Planning and Sustainable Development:

SUBJECT: Public Scoping Comments Received for U.S. Navy Pacific Missile Range Facility and National Aeronautics and Space Administration Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement (DTS 202405131013NA)

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) appreciate the comments and feedback received from the public, state, and federal agencies as part of the public scoping process for the Navy Pacific Missile Range Facility (PMRF) and NASA Kōke‘e Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). As discussed at the public scoping meetings, the Navy and NASA are developing an EIS to evaluate the potential environmental consequences of their proposal to retain State lands presently utilized pursuant to leases and easements on Kaua‘i. The Navy proposes to retain use of 8,348 acres for operational continuity and sustainment at PMRF. NASA proposes to retain use of 23 acres for continued operations, including measurements of the Earth’s rotation and local land motion, at KPGO.

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United States Environmental Protection Agency, Region 9

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Appendix J

Scoping Report

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SCOPING SUMMARY REPORT

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate

Environmental Impact Statement

FINAL

August 2024
Revised April 2025

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Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement
Scoping Summary Report
Final

This report summarizes public involvement and stakeholder outreach activities for the scoping period for the United States (U.S) Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA) *Pacific Missile Range Facility (PMRF) and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS)*. The scoping period ran from May 8, 2024, to June 17, 2024.

The purpose of public involvement and outreach during the scoping phase was to notify the public, elected officials, government agencies, nongovernmental organizations, Native Hawaiian Organizations, and other stakeholders about the Navy's and NASA's intent to prepare an EIS in accordance with the National Environmental Policy Act (NEPA) and Hawaiʻi Revised Statutes (HRS) Chapter 343 (commonly known as the "Hawaiʻi Environmental Policy Act [HEPA]"). As part of scoping, the Navy and NASA solicited comments on the proposed real estate action including proposed alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, any information the public would like to see addressed in the EIS, and the project's potential to affect historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and HRS Section 6E-42.

The Navy and NASA recognize the importance of public engagement and have made significant efforts to encourage public participation during the scoping process, exceeding those required by NEPA and HEPA to ensure the broadest effort to notify, inform, and engage the public in this EIS scoping process.

Additional outreach efforts include the following:

- A 40-day comment period, 10 days more than the minimum 30-day period;
- Multiple, consecutive newspaper and social media advertisements;
- Offer to hold advanced stakeholder briefings;
- Personalized notification letters; and
- A pre-Notice of Intent (NOI) and EIS Preparation Notice Flyer posted on the PMRF and NASA websites.

Summary of Activities

A. PUBLIC NOTIFICATION

The Navy and NASA prepared materials to notify the public of the intent to prepare an EIS and provide project information and public involvement opportunities.

Federal Register Notice and The Environmental Notice

A NOI to prepare an EIS was published in the *Federal Register* on May 9, 2024, and the EIS Preparation Notice (EISPN) was published in State of Hawaiʻi, Office of Planning and Sustainable Development's Environmental Review Program semi-monthly publication, *The Environmental Notice*, on May 8, 2024. The *Federal Register* notice is found in Attachment A to this Scoping Summary Report, and *The Environmental Notice* publication is found in Attachment B.

Newspaper Advertisements

Display advertisements were placed in four local and regional newspapers in Hawaiʻi. The advertisements were published beginning May 8, 2024, to coincide with publication of the EISPN in *The Environmental Notice*. The advertisements were published for three consecutive days, including on Sunday if the publication schedule allowed.

Table 1 shows the newspapers and corresponding publication dates for each advertisement. The newspaper advertisements are found in Attachment C.

Table 1: Newspaper Publications for the Notice of Intent and Environmental Impact Statement Preparation Notice

Newspaper	Newspaper Coverage	Publication Frequency	Publication Dates
The Honolulu-Star Advertiser	Hawaiian Islands	Daily; except Saturday	Wednesday, May 8, 2024 Thursday, May 9, 2024 Friday, May 10, 2024 Sunday, June 2, 2024 Monday, June 3, 2024 Tuesday, June 4, 2024
The Garden Island	Kauaʻi	Daily; except Sunday	Wednesday, May 8, 2024 Thursday, May 9, 2024 Friday, May 10, 2024 Saturday, June 1, 2024 Monday, June 3, 2024 Tuesday, June 4, 2024 Including online events calendar
MidWeek Kauaʻi	Kauaʻi	Wednesdays	Wednesday, May 15, 2024 Wednesday, May 22, 2024 Wednesday, May 29, 2024 Wednesday, June 5, 2024 Including online events calendar
Ka Wai Ola News	Hawaiian Islands	Monthly	Saturday, June 1, 2024

Stakeholder Notification Letters

Notification letters were mailed on May 8, 2024, via first-class mail, to 174 stakeholders comprising elected officials (local, state, federal), government agencies (local, state, federal), environmental organizations and other non-governmental organizations (local, regional, national, government programs), Native Hawaiian Organizations and cultural centers, and participants in the Cultural Impact Assessment. Stakeholders were offered a briefing upon request and provided a point of contact should they have questions. A copy of the stakeholder letter is found in Attachment D.

Postcard Mailer

Notification postcards were mailed on May 8, 2024, via first-class mail, to 96 stakeholders, including the following: agencies and environmental organizations; Native Hawaiian Organizations; schools, colleges, and universities; small business associations, economic development/tourism organizations, and recreational and real estate interests; fishing and diving interests; community planning groups and civic organizations; boating, yacht clubs, and marinas; libraries; and other interested individuals and groups. A copy of the postcard is found in Attachment E.

Mailing List

A mailing list for the stakeholder letter and postcard was developed from the project Strategic Communications Plan, Hawaii-California Training and Testing EIS/Overseas EIS (OEIS) project mailing list, and Navy and NASA stakeholder lists for Kaua‘i. The list was updated to add individuals who requested to be added to the mailing list. The complete mailing list is provided in Attachment F.

News Release and Media Distribution

A news release was distributed May 8, 2024, by the Public Affairs Officers (PAOs) for Commander, Navy Region Hawaii, PMRF, and NASA to local, regional, and national media. The news release provided a description of the Proposed Action, its purpose and need, resources to be analyzed in the EIS, project website address, public commenting information, information about the scoping meetings, and information about consultation under Section 106 of the NHPA. Additionally, information about the scoping process for the EIS to include information on the public meetings and how to submit public comments was also provided in the news release. The news release also provided contact information for media questions. The news release is found in Attachment G.

Social Media Posts

Social media posts began on May 8, 2024, and continued through the end of the public comment period on June 17, 2024. Commander, Navy Region Hawaii and PMRF posted to their social media accounts, including the Navy Region Hawaii Facebook and X pages and PMRF Facebook page. NASA posted to their social media accounts, including KPGO and Space Geodesy Project (SGP) page. Social media was used to raise awareness of the NOI and EISPN, public meetings, and public comment period. Social media posts are found in Attachment H.

Flyer

A flyer was created to notify community members about the NOI and EISPN, public meetings, and comment period. PMRF distributed the flyer to their community contacts via email and in-person events and meetings. A copy of the flyer is found in Attachment I.

B. PUBLIC SCOPING INFORMATION

Project Website

A website has been established by the Navy and NASA to provide the public with project information. The website will remain active throughout the EIS process. The website serves as a repository of information and includes notices, maps, the public scoping meeting presentation, posters and fact sheets, and other project information. Other highlights of the website include educating the public on the environmental planning process, PMRF conservation and community activities, information center for frequently asked questions (FAQs), and means for the public to reach out to the EIS team. The public was able to submit comments via the website using the online comment form and subscribe to receive future notifications.

The project website for the Navy and NASA is https://www.pmrf-kpgo-eis.com/ and the address was included in all public notifications. Fact sheets and link to the project website can be found at NASA’s SGP website https://space-geodesy.nasa.gov/. The project website included information about the public meetings and was updated after the close of the public scoping period. The website was made available to the public on May 8, 2024, and announced on both the Navy’s PMRF and NASA’s SGP websites.

Selected screen captures of the website are found in Attachment J.

Fact Sheet Booklet

A 12-page fact sheet booklet was prepared that included details about the following: the Proposed Action and alternatives; its purpose and need; the NEPA, HEPA, and Section 106 processes; public involvement opportunities; environmental stewardship activities; and information about PMRF and KPGO. The fact sheet booklet can be found in Attachment K. The fact sheet booklet was posted on the project website and provided at the public meetings.

Stakeholder Briefings

Monthly meetings with the Navy, NASA, and Department of Land and Natural Resources (DLNR) - Land Division started on May 28, 2024, and continue to occur on the last Tuesday of every month. Neither the Navy nor NASA received any other request for briefings. Briefings included information about the Proposed Action and alternatives; its purpose and need; the NEPA, HEPA, and Section 106 processes; resources affected; public involvement opportunities; environmental stewardship activities; and about PMRF and KPGO.

C. PUBLIC MEETINGS

The Navy and NASA initiated a public scoping period to receive comments on the scope of the EIS. Members of the public were encouraged to participate in the environmental planning process by providing input on the proposed real estate action including proposed alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, any information the public would like to see addressed in the EIS, and the project's potential to affect historic properties pursuant to Section 106 of the NHPA and HRS Section 6E-42.

Public scoping meetings were held June 4–6, 2024, at three locations on Kaua'i. The scoping meetings also served as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the NHPA and HRS Section 6E-42. All meetings were held from 5 to 8 p.m. Hawai'i Standard Time (HST). Table 2 provides the meeting dates, locations, and agenda as advertised.

Table 2 Public Meeting Dates and Locations

Date	Location	Time and Agenda
Tuesday, June 4, 2024	Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Līhu'e	**Meeting Times:** 5 to 8 p.m. HST **Agenda:** • **5 to 8 p.m.** Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment. • **6 to 6:30 p.m.** Project presentation by Navy and NASA.
Wednesday, June 5, 2024	Kekaha Neighborhood Center 8130 Elepaio Rd., Kekaha	
Thursday, June 6, 2024	Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a	

Meeting Format

The public meetings were open house style with the project presentation moderated by a facilitator. The meetings opened with protocol led by a Hawaiian cultural practitioner. Information stations were organized by topic and arranged around the room enabling the public to meet project team members and ask questions. Members of the public were encouraged to visit the comment station to provide

written comments and/or oral comments to a court reporter. Oral comments were audio recorded in accordance with HEPA requirements. The 3-hour open house session included a project presentation by Navy and NASA leadership and project team members. The presentation covered the project's purpose and need, description of the Proposed Action and proposed alternatives, overview of the NEPA/HEPA environmental review process, public involvement opportunities, and information about PMRF and KPGO including environmental and cultural stewardship. After the presentation, attendees were invited to return to the poster stations to continue conversations with project team members and provide comments. An American Sign Language interpreter was available remotely via Zoom, and Hawaiian interpreters (and other languages) were available upon request. The open house meeting also included a children's activity station with coloring books and other activities to allow the parents to focus on the project information.

The station topics are listed below. Each station was staffed by subject matter experts.

- Welcome/Sign-In Table
- Why We Are Here Tonight
- About PMRF and About KPGO
- Project Map
- Proposed Action and Alternatives
- Environmental Resources to be Studied in the EIS
- Conservation and Community/Care of the Land
- NEPA/HEPA/Community Involvement
- Comments Table/Written Comments
- Comments Table/Oral Comments

A copy of the posters and other handouts produced for the public meetings are found in Attachment L and Attachment M. A copy of the presentation slides is found in Attachment N. Additionally, this information is available to the public under the "Documents" tab (Informational Materials Section) on the website, https://www.pmrf-kpgo-eis.com/.

D. SUMMARY OF PUBLIC SCOPING COMMENTS

This section is intended to summarize the comments identified during the EIS scoping phase; it is not meant to identify all comments or respond to comments. A formal scoping comment response section will be included in the Draft EIS.

The public scoping period ran from May 8, 2024, to June 17, 2024. Eighty-four comment letters were received. Twenty-nine comments were submitted using the project website's online comment form, 28 via email, 2 from postal mail, 11 in writing at the public meetings, and 14 orally to the court reporter at the public meetings.

Each comment was reviewed and categorized into specific resource areas or topics. One comment may have comments on multiple resource areas or topics. All comments were compiled, logged, and distributed to the EIS project team and appropriate subject matter experts. The EIS project team discussed the impact, significance, and relevance of the comments to the preparation of the Draft EIS. All comments submitted during the public scoping period will become part of the public record and will be considered during the development in the Draft EIS.

Table 3 includes a summary of scoping comments in order to provide a brief overview of the issues and concerns expressed during this EIS scoping phase.

Table 3 Summary of Scoping Comments

Resource Area/Topic	Issue/Concern
Proposed Action and Alternatives	• The Proposed Action does not include Navy activities on fee simple land. Impacts in the EIS should include impacts from Navy activities on fee simple lands. • Concerns about military presence and training around the Hawaiian Islands, which commenters consider sensitive environments. • Concerns about impacts from Navy activities at PMRF and from agricultural activities to the local environment and public health. • Request for military training to be conducted away from the Hawaiian Islands, which commenters consider sacred lands. • Concerns about increasing development and infrastructure and associated impacts. • Request the EIS include how ongoing missile system tests on fee simple lands impacts the environment. • Request for a figure that shows the individual leases and easements. • Request for additional details regarding military readiness at PMRF and additional details about the Proposed Action including details about KPGO surveillance and tracking. • The Project has no benefit to the community. • Concerns about the impacts training with explosives has on land and the marine environment around Hawaiʻi. • Increased detail regarding the No Action alternative including a request for robust description of restoration following the end of the lease, and concern about infrastructure that could be abandoned in place under the terms of the current leases. • The two action alternatives are similar and additional alternatives should be considered to include: ▪ a more distinctive action alternative ▪ a modified Proposed Action ▪ a shorter-term lease ▪ restoration of the Mānā plains to wetlands and cultural practice areas ▪ removal of agriculture ▪ expansion of the Kawaiʻele Bird Sanctuary ▪ reduce Navy reliance on non-renewable energy ▪ replace big agricultural lessees with small local farmers • Concern about linking the analysis of Navy and NASA Proposed Actions. • Develop alternatives that take into account other foreseeable and needed projects on the Mānā plains and surrounding areas; e.g., West Kauaʻi Energy Project, infrastructure for Department of Hawaiian Homelands use, water diversions to support instream flows, groundwater use restrictions and needs, siting and construction of a new landfill, repair roadways to Kōkeʻe, the ongoing need for pollution control improvements to the Mānā ditch system, and Kauaʻi's acute need for affordable housing. • Identify Best Management Practices and better define the activities that occur on the leased and easement lands. • Integrate applicable nature-based project elements into the Project design. • Dune restoration could be incorporated into the Project. • Consider new technological developments associated with the Project.

Resource Area/Topic	Issue/Concern
	• As part of the new agreements, request Navy and NASA provide additional community resources including services and infrastructure. • Recommend NASA transfer its technologic infrastructure at KPGO to Space Force and phase out NASA's presence on Kaua'i. • Explain facilities on Ni'ihau and their relationship to the Proposed Action. • Support for the military's presence and activities. • Support for NASA's presence and activities. • Support for the Navy and NASA land stewardship. • Support of the No Action Alternative. • Support for Alternative 2.
Air Quality and Greenhouse Gases	• Provide thorough air quality data at PMRF, documentation and reporting of any incidents that have impacted air quality, and emissions data from all activities at PMRF. • Consider electric buses for use by the Navy at PMRF and other renewable energy technologies for improved base sustainability.
Biological Resources	• Request for Navy and NASA to provide natural resource data for leased and easement lands. • Concern about impacts to coastal lands and wetlands. • Concern about endangered species, including marine species. • Effects of noise, light pollution, and chemical byproducts to biological resources. • Concern of ecosystem-scale effects from military activities. • Concern about impacts from invasive species. • Concern about impacts to avian species at Kōke'e. • Consider lowland forest restoration to remediate soil and capture carbon dioxide. • Recommend early consultation with the Division of Forestry and Wildlife and U.S. Fish and Wildlife Service. • Preserve and restore natural terrestrial and marine environments.
Cultural Practices/Archaeological and Historic Properties/NHPA Section 106 Process/HRS 6E Process	• Concern about Native Hawaiian's cultural attachment to the land and stress that their lands were wrongly taken. • Consider how effects of permanent loss of state land through fee simple retention given the unique historic context of the area. • Discuss mental and emotional health impacts, sense of loss and injustice, in addition to impacts to other resources, and identify mitigation. • Establish regular communication with Native Hawaiian communities and explore other state-owned lands that could be repurposed for community use. • Request for Navy and NASA to provide information on cultural resources and cultural practices. • Request to engage in early consultation under Section 106 of the NHPA. • The Hawai'i Revised Statutes, HRS Chapter 6E process should inform the environmental review process, and incorporate any mitigation identified from the HRS 6E process. • Request for the Navy to consult with Native Hawaiian Organizations, homestead communities, and Native Hawaiian Ni'ihau beneficiaries. • Concern about impacts to culturally sensitive sites. • Concern about access for cultural practices and gathering rights at PMRF. • Discuss whether dune restoration would protect cultural sites. • Concern about impacts to culturally sensitive plants and animals. • Ensure a Cultural Impact Assessment is prepared for the Project and include a list of who was consulted. • EIS should incorporate a Ka Pa'akai analysis.

Resource Area/Topic	Issue/Concern
	• EIS should consider the cultural landscape. • Concern about impacts to cultural practices from water diversion to the wetland.
Cumulative Effects	• Include a description of environmental conditions prior to military use.
EIS Process	• Concern about different interests and obligations of the federal government (Navy and NASA) and the State of Hawaii (DLNR) regarding decisions about public trust lands. • Concern about the state's responsibility as the trustee of these public lands in the public trust to malama ʻāina. • Revise Purpose and Need to reflect the state's duty to enforce the Navy and NASA's terms of the lease consistent with principles of malama ʻāina. • Public meetings should provide an opportunity for the public to interact with each other. • Request an independent body prepare the EIS. • Not enough advertising was conducted for scoping.
Hazardous Materials and Waste	• Concern about the presence of hazardous materials and waste in the land, water, and air from activities at PMRF. • Concern about Navy clean-up after testing activities at PMRF. • Concerns about certain contaminants. • Concern about fuel storage tank conditions at PMRF. • Request removal of fuel storage tanks at PMRF. • Request for third party testing of sites for hazardous materials. • Concerns about PFAS at PMRF. • Concerns about solid waste management.
Land Use and Access	• Concern about ongoing effects from the presence of the military on Kauaʻi. • EIS should include history of land title and land use, including initial negotiation and approval of leases and easements. • EIS should analyze the land use zoning and permitting requirements. • Request for increased access to the beach for fishing, water sports (i.e., surfing and kayaking), walking, horseback riding, and camping from Kekaha Beach to Polihale.
Ocean ROW	• Request explanation for not including the Ocean ROW lease in the area of analysis. • Clarify how Ground Hazard Areas and Launch Hazard Areas are related to the Ocean ROW.
Other	• Concern about the Navy's actions impacting marine resources from underwater testing and training, and pollution from runoff at PMRF. • Request to demilitarize the Hawaiian Islands, returning the land to the people of Hawaiʻi with no trace of previous military activities. • Concerns about how the military is perceived to treat the Hawaiian Islands. • Concerns about the U.S. military and destruction caused to other countries. • Request for all acronyms to be defined and for the EIS to be consistent in use of diacriticals. • Request for EIS to define use of uncommon terms. • Concerns about impacts from RIMPAC activities.
Public Health and Safety	• Concern about impacts from agricultural activities on the easements. • Concern about impacts of explosive ordnance storage at PMRF. • Request for safety procedures to prevent unintentional or unauthorized detonation of ordnance be identified in the EIS. • Concern about public safety risks from Navy ordnance and hazardous material transfer on Kauaʻi. • Concern about electromagnetic radiation effects on people, wildlife, and weather.

Resource Area/Topic	Issue/Concern
	• Concerns about wildfire. • Concern about noise impacts on people.
Real Estate Agreements	• Request for a list of reports for all site inspections conducted by DLNR. • Include copies of the leases and easements.
Socioeconomics	• Concern about the low cost of the current leases and easements (only $1 for the Navy). • Support for socioeconomic benefit of the Navy and NASA to Kaua‘i. • Support for socioeconomic benefit of Alternative 2. • Concern about economic impacts of the military and associated costs. • Concern about fair market value of the new real estate agreements, and request for backpay.
Transportation	• Concern about impacts from Navy’s use of the roads.
Visual Resources	• Concern about impacts to viewsheds.
Water Resources	• Concerns about the Navy’s water use. • Discuss how current groundwater pumping at PMRF will affect the project, and if updating the practices would increase resilience. • Request for the Navy and NASA to provide information on punawai spring water sources. • Concern about impacts to water quality from Navy activities, including wells. • Concern about the Navy’s responsibility to apply for a National Pollutant Discharge Elimination System permit for outfall discharges. • Identify interconnected system of irrigation ditches. • Concerns about Red Hill and similar impacts to other water resources from Navy activities at PMRF.

Legend: DLNR = Department of Land and Natural Resources; EIS = Environmental Impact Statement; HRS = Hawaii Revised Statute; KPGO = Kōke‘e Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; NHPA = National Historic Preservation Act; PFAS = Per- and polyfluoroalkyl substances; PMRF = Pacific Missile Range Facility; RIMPAC = Rim of the Pacific; ROW = right-of-way; U.S. = United States

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Attachment A

including the agenda, is available on the DHB website, *https://www.health.mil/dhb.* A copy of the agenda or any updates to the agenda for the June 4, 2024, meeting will be available on the DHB website. Any other materials presented in the meeting may also be obtained at the meeting.

Purpose of the Meeting: The DHB provides independent advice and recommendations to maximize the safety and quality of, as well as access to, health care for DoD health care beneficiaries. The purpose of the meeting is to provide progress updates on specific tasks before the DHB. In addition, the DHB will receive information briefings on current issues related to military medicine.

Agenda: The DHB anticipates receiving updates from the DHB Public Health Subcommittee's tasking on Effective Public Health Communication Strategies with DoD personnel and the DHB Trauma and Injury Subcommittee's tasking on Prolonged Theater Care. The DHB also anticipates receiving briefings about the National Center for Disaster Medicine and Public Health and the Health of the Force Report.

Meeting Accessibility: Pursuant to 5 U.S.C. 552b and 41 CFR 102–3.140 through 102–3.165, this meeting is open to the public from 12:00 p.m. to 5:30 p.m. on June 4, 2024. The meeting will be held by videoconference/teleconference. The number of participants is limited and is on a first-come basis. All members of the public who wish to participate must register by emailing their name, rank/title, and organization/company to *dha.dhb@health.mil* or by contacting Dr. Clarice Waters at (703) 275–6003 no later than Tuesday, May 28, 2024. Once registered, participant access information will be provided.

Special Accommodations: Individuals requiring special accommodations to access the public meeting should contact Dr. Clarice Waters at (703) 275–6003 at least five (5) business days prior to the meeting so that appropriate arrangements can be made.

Written Statements: Any member of the public wishing to provide comments to the DHB related to its current taskings or mission may do so at any time in accordance with section 10(a)(3) of the FACA, 41 CFR 102–3.105(j) and 102–3.140, and the procedures described in this notice. Written statements may be submitted to the DHB's Designated Federal Officer (DFO), CAPT Clausen, at *shawn.s.clausen.mil@health.mil.* Supporting documentation may also be included, to establish the appropriate historical context and to provide any necessary background information. If the written statement is not received at least five (5) business days prior to the meeting, the DFO may choose to postpone consideration of the statement until the next open meeting. The DFO will review all timely submissions with the DHB President and ensure they are provided to members of the DHB before the meeting that is subject to this notice. After reviewing the written comments, the President and the DFO may choose to invite the submitter to orally present their issue during an open portion of this meeting or at a future meeting.

Dated: May 6, 2024.

Aaron T. Siegel,

Alternate OSD Federal Register Liaison Officer, Department of Defense.

[FR Doc. 2024–10123 Filed 5–8–24; 8:45 am]

BILLING CODE 6001–FR–P

DEPARTMENT OF DEFENSE

Department of the Navy

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Notice of Intent To Prepare an Environmental Impact Statement for Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate

AGENCY: Department of the Navy (DON), Department of Defense (DoD), and National Aeronautics and Space Administration (NASA).

ACTION: Notice.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969 and regulations implemented by the Council on Environmental Quality, the Department of the Navy (DON) and National Aeronautics and Space Administration (NASA), the DON and NASA announce their intent to prepare an Environmental Impact Statement (EIS) to evaluate the potential environmental effects associated with the continued long-term DoD use of 8,348 acres of State lands on Kauai, Hawaii for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF), and the continued long-term NASA use of 23 acres of State lands on Kauaʻi, Hawaii in support of continued operations (including measurements of the Earth's rotation and local land motion) at Kōkeʻe Park Geophysical Observatory (KPGO).

DATES: The 40-day public scoping period begins on May 8, 2024, and extends to June 17, 2024. Comments must be postmarked or submitted electronically via the project website no later than 11:59 p.m. Hawaii Standard Time (HST) on June 17, 2024 for consideration in the Draft EIS.

Public scoping meetings are planned as follows:

- June 4, 2024, from 5:00–8:00 p.m. HST at Kauaʻi Veterans Center, 3215 Kauaʻi Veterans Memorial Highway, Līhuʻe
- June 5, 2024, from 5:00–8:00 p.m. HST at Kekaha Neighborhood Center, 8130 Elepaio Road, Kekaha
- June 6, 2024, from 5:00–8:00 p.m. HST at Sheraton Coconut Beach Resort, 650 Aleka Loop, Kapaʻa

The purpose of the scoping period is to provide the public with information related to the Proposed Action, its purpose and need, environmental resources to be analyzed in the EIS, the NEPA and HEPA process, consultation under NHPA, and public involvement opportunities. The DON and NASA are providing a web-based platform, as well as public scoping meetings for the public to learn about the Proposed Action and alternatives and to provide scoping comments. Comments must be postmarked or submitted electronically via the website no later than 11:59 p.m. HST on June 17, 2024 for consideration in the Draft EIS.

ADDRESSES: The DON and NASA invite all interested parties to submit scoping comments on the EIS or information regarding historic properties or Section 106 consulting party interest through the project website at *http://www.PMRF-KPGO-EIS.com* or by mail to: Naval Facilities Engineering Systems Command, Hawaii, Environmental OPHEV2, Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, 400 Marshall Road, Building X–11, Pearl Harbor, HI 96860.

FOR FURTHER INFORMATION CONTACT:

DON: Commander, Navy Region Hawaii, Attn: Mr. Danny Hayes, Environmental Public Affairs Specialist, by telephone (808–473–0662) or email (*danny.r.bxhayes6.civ@us.navy.mil*).

NASA: Shari A. Miller, NASA; EIS Project Manager, by telephone (757–824–2327) or email (*Shari.A.Miller@nasa.gov*).

SUPPLEMENTARY INFORMATION:

As the proposed action involves State lands, the EIS will be a joint NEPA, Hawaii Environmental Policy Act (HEPA) (as governed by Hawaii Revised Statutes [HRS] chapter 343), and Hawaii Administrative Rules (HAR) section 11–200.1 (implementing HRS chapter 343) document; therefore, the public scoping processes will run concurrently and will jointly meet NEPA and HEPA

requirements. The DON and NASA are initiating a 40-day public scoping process to receive comments on the scope of the EIS including identification of potential alternatives and environmental concerns, information and analyses relevant to the Proposed Action, issues the public would like to see addressed in the EIS, and the project's potential to affect historic properties pursuant to section 106 of the National Historic Preservation Act (NHPA) of 1966. DON's action proponent for this proposal is Commander, Navy Region Hawaii.

The DON's purpose for the Proposed Action is to maintain long-term DoD use of 8,348 acres of State lands (including leaseholds and easement lands) on Kaua'i, Hawaii for operational continuity and sustainment of the military readiness mission. NASA's purpose for the Proposed Action is to maintain long-term use of 23 acres of State land on Kaua'i, Hawaii for continued operations of KPGO. The Proposed Action is needed because the existing real estate agreements are set to expire between 2027 and 2030. Preserving the long-term DoD and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global significance. It also ensures the continued conservation management by the DON and NASA of natural and cultural resources on these lands.

For the Hawaii Department of Land and Natural Resources (DLNR), in addition to its role as the lessor of State lands, the proposed real estate action presents an opportunity for the agency to secure a revenue source to support its management of public lands and associated environmental and conservation programs. Fees from leases and easements are put into a State fund as required by law.

By ensuring continued DON and NASA operations on Kaua'i, the real estate action would also preserve local jobs and income for the residents of Kaua'i, financially contribute to the overall economic well-being of Kaua'i, and maintain continued conservation management of natural and cultural resources on State lands at no cost to the State of Hawaii.

The DON and NASA have identified two preliminary action alternatives to carry forward for analysis in the EIS, along with the No Action Alternative.

Alternative 1 (Succeeding Current Real Estate Agreements): The DON and NASA would apply to DLNR for new long-term real estate agreements in the same manner and for the same uses as the current leases and easements.

Alternative 2 (Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds): The DON and NASA would pursue fee simple acquisition of 700 acres (684—DON, 16—NASA) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1.

Alternative 3 (No Action Alternative): The DON and NASA would not seek any real estate agreements for the State lands on Kaua'i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the DON and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place (as determined by the existing real estate agreements), from the DON and NASA leased and easement lands.

Consistent with Council on Environmental Quality regulations and HAR section 11–200.1–24(b), the scope of the analysis for the alternatives in this EIS is proportionate to the potential for environmental impacts. The following 13 resources have a potential for impacts and are analyzed in this EIS: archaeological and historic resources, cultural practices, biological resources, land use, socioeconomics, environmental justice, water resources, utilities, public health and safety, air quality and greenhouse gases, transportation, hazardous materials and wastes, and visual resources. The EIS will analyze measures that would avoid, minimize, or mitigate environmental effects. The DON and NASA will conduct coordination, consultation, and permitting activities required by the NHPA, the Endangered Species Act, the Clean Water Act, the Coastal Zone Management Act, Hawaii Revised Statues chapter 183C and HAR chapter 13–5, HAR chapter 6E, and other laws and regulations determined to be applicable to the project.

This EIS will satisfy both Federal and State of Hawaii requirements and provide the necessary analyses to allow the DON, NASA, and DLNR to consider the environmental effects of the Proposed Action and alternatives as part of their decision-making. The DON and NASA encourages Federal, State, and local agencies, and interested persons to provide comments concerning the alternatives proposed for study and environmental issues for analysis in the EIS, as well as to identify specific environmental resources the DON and NASA should consider when developing the Draft EIS. The DON and NASA will prepare the Draft EIS and will include analyses of potential effects to the resources the DON, NASA, and the commenting public have identified. All comments received during the public scoping period will be considered during EIS preparation.

Comments must be postmarked or submitted electronically by email to *info@PMRF-KPGO-EIS.com,* and/or electronically through the EIS website at *www.PMRF-KPGO-EIS.com.* Comments must be posted by 11:59 p.m. HST on June 17, 2024.

After the scoping period, the DON and NASA will develop the Draft EIS. The DON and NASA intend to release the Draft EIS in summer of 2025, the Final EIS in spring of 2026, with a Record of Decision signed in late spring of 2026.

Dated: May 6, 2024.

Emily A. Pellegrino,

Program Analyst, Directives and Regulatory Team, National Aeronautics and Space Administration.

J.E. Koningisor,

Lieutenant Commander, Judge Advocate General's Corps, U.S. Navy, Federal Register Liaison Officer.

[FR Doc. 2024–10167 Filed 5–8–24; 8:45 am]

BILLING CODE 3810–FF–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings #1

Take notice that the Commission received the following electric rate filings:

Docket Numbers: ER23–2764–004.
Applicants: Northeastern Power & Gas, LLC.
Description: Tariff Amendment: Amendment to 12 to be effective 9/25/2023.
Filed Date: 5/3/24.
Accession Number: 20240503–5171.
Comment Date: 5 p.m. ET 5/24/24.

Docket Numbers: ER24–1420–001.
Applicants: Sierra Estrella Energy Storage LLC.
Description: Tariff Amendment: Response to Deficiency Letter to be effective 3/18/2024.
Filed Date: 5/3/24.
Accession Number: 20240503–5097.
Comment Date: 5 p.m. ET 5/24/24.

Docket Numbers: ER24–1421–001.
Applicants: Superstition Energy Storage LLC.
Description: Tariff Amendment: Superstition Energy Storage LLC submits tariff filing per 35.17(b): Response to Deficiency Letter to be effective 3/18/2024.
Filed Date: 5/3/24.
Accession Number: 20240503–5098.

Attachment B

JOSH GREEN, M.D.
GOVERNOR | KE KIA'ĀINA

SYLVIA LUKE
LIEUTENANT GOVERNOR | KA HOPE KIA'ĀINA

STATE OF HAWAIʻI | KA MOKUʻĀINA ʻO HAWAIʻI
DEPARTMENT OF LAND AND NATURAL RESOURCES
KA ʻOIHANA KUMUWAIWAI ʻĀINA

P.O. BOX 621
HONOLULU, HAWAII 96809

DAWN N.S. CHANG
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RYAN K.P. KANAKAʻOLE
FIRST DEPUTY

DEAN D. UYENO
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

April 29, 2024

Mary Alice Evans, Acting Director
Office of Planning and Sustainable Development
c/o Environmental Review Program
235 South Beretania Street, Room 702
Honolulu, Hawaiʻi 96813

SUBJECT: Publication of the Environmental Impact Statement Preparation Notice (EISPN) for the Proposed Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Project Located in Kekaha, West Kauaʻi on the Island of Kauaʻi, Further Identified as Tax Map Key(s): (4)1-2-001:001, 006, & 010; (4)1-2-002:001, 010-013, 015, & 024-030; (4) 1-2-016:011; (4) 1-4-001:002, 013, 014, & 999; and (4) 2-1-003:018

Dear Ms. Evans:

With this letter, the Department of Land and Natural Resources (DLNR) submits the Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement Preparation Notice (EISPN) for publication in the next available edition of The Environmental Notice on May 8, 2024. The applicants for the action are the United States Department of the Navy (U.S. Navy) and the National Aeronautics and Space Administration (NASA).

The DLNR has coordinated with the applicants to determine the appropriate level of environmental review for the action. So as to not overlook any potentially significant impact to the natural and/or human environment, an Environmental Impact Statement will be prepared pursuant to Hawaiʻi Revised Statutes (HRS) §343-5(e) and Hawaiʻi Administrative Rules (HAR) §11-200.1-14(d)(2).

The required publication form and files have been provided electronically via the "Online Submittal Form" on the Office of Planning and Sustainable Development, Environmental Review Program website. The submittal includes a .pdf file of the EISPN and .zip file containing a shapefile of the project's location boundary. Concurrent with the electronic submittal and as required by HAR §11-200.1-5(4)(B), paper copies of the EISPN have been submitted to the nearest state library (Waimea Public Library, Kauaʻi) and the Hawaiʻi Documents Center (Hawaiʻi State Library, Oʻahu).

Pursuant to HAR §11-200.1-23(10)(c), publication of the EISPN in *The Environmental Notice* initiates a 30-day public comment period for parties to provide comments regarding potential effects of the proposed action. A Notice of Intent for the project will also be published in the Federal Register. The applicants are preparing a single EIS compliant with both the Hawai'i Environmental Impact Statements law (HRS Chapter 343) and the National Environmental Policy Act as allowed under HAR §11-200.1-31.

Should you have any questions, please contact Mr. Russell Tsuji, Land Division Administrator at (808) 587-0422.

Sincerely,

Dawn N.S. Chang,
Chairperson

From: webmaster@hawaii.gov
To: DBEDT OPSD Environmental Review Program
Subject: New online submission for The Environmental Notice
Date: Wednesday, May 1, 2024 8:41:33 AM

Action Name

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Type of Document/Determination

Environmental impact statement preparation notice (EISPN)

HRS §343-5(a) Trigger(s)

- (1) Propose the use of state or county lands or the use of state or county funds
- (2) Propose any use within any land classified as a conservation district

Judicial district

Waimea, Kauaʻi

Tax Map Key(s) (TMK(s))

(4) 1-2-002:001; (4) 1-2-002:012; (4) 1-2-002:015; (4) 1-2-002:027; (4) 1-2-002:028; (4) 1-2-001:006; (4) 1-2-016:011; (4) 1-4-001:999; (4) 1-2-002:029; (4) 1-2-002:030; (4) 2-1-003:018; (4) 1-2-001:001; (4) 1-2-002:024; (4) 1-2-002:025; (4) 1-2-002:026; (4) 1-4-001:002; (4) 1-4-001:013; (4) 1-4-001:014; (4) 1-2-002:013; (4) 1-2-001:010; (4) 1-2-002:010; (4) 1-2-002:011; (4) 1-4-001:013

Action type

Applicant

Other required permits and approvals

Numerous

Discretionary consent required

Use of State land

Approving agency

Department of Land and Natural Resources, Land Division

Agency contact name

Russell Tsuji

Agency contact email (for info about the action)

dlnr.land@hawaii.gov

Email address or URL for receiving comments

info@PMRF-KPGO-EIS.com

Agency contact phone

(808) 587-0419

Agency address

1151 Punchbowl Street
Room 220
Honolulu, Hawaii 96813
United States
Map It

Public Scoping Meeting information

6/4/2024, 5-8pm 3215 Kaua‘i Veterans Memorial Highway, Līhu‘e

Accepting authority

State of Hawaii Board of Land and Natural Resources

Applicant

United States Department of the Navy

Applicant contact name

Kerry Wells

Applicant contact email

info@PMRF-KPGO-EIS.com

Applicant contact phone

(808) 473-0662

Applicant address

400 Marshall Road
Building X-11
Pearl Harbor, Hawaii 96860
United States
Map It

Is there a consultant for this action?

Yes

Consultant

Cardno GS-AECOM Pacific Joint Venture

Consultant contact name

Michele Lefebvre

Consultant contact email

info@PMRF-KPGO-EIS.com

Consultant contact phone

(808) 791-9872

Consultant address

737 Bishop Street
Suite 3050
Honolulu, Hawaii 96813
United States
Map It

Action summary

The Navy proposes to retain the use of 8,348 acres of State lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kaua‘i, Hawai‘i, in support of continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO).

Attached documents (signed agency letter & EA/EIS)

- 240429-ERP-Transmittal-Letter-for-PMRF-EISPN-RUSH-part-1-signed.pdf
- PMRF-and-KPGO-RE-EIS-Version-Report-EISPN-1May2024.pdf

Action location map

- PMRF-and-KPGO-Real-Estate-EIS-Location-Boundary.zip

Authorized individual

Michele Lefebvre

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE

for

PACIFIC MISSILE RANGE FACILITY AND KŌKEʻE PARK GEOPHYSICAL OBSERVATORY REAL ESTATE

KAUAʻI, HAWAIʻI

May 2024

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Project Information Summary (Abstract)

Project Name:	Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement	
Applicants (Joint Lead Agencies under NEPA):	United States Department of the Navy Naval Facilities Engineering Systems Command Environmental OPHEV2 400 Marshall Road Building X-11 Pearl Harbor, HI 96860 Contact: Kerry Wells Phone: 808-473-0662 Email:info@PMRF-KPGO-EIS.com	National Aeronautics and Space Administration Goddard Space Flight Center 34200 Fulton Street Wallops Island, VA 23337, Contact: Shari Miller Phone: 757-824-2327 Email: Shari.A.Miller@nasa.gov
Approving Agency:	Department of Land and Natural Resources, Land Division 1151 Punchbowl Street, Room 220 Honolulu, Hawaiʻi 96813 Phone: 808-587-0419 Email: dlnr.land@hawaii.gov	
Accepting Authority:	State of Hawaii Board of Land and Natural Resources	
Planning Consultant:	Cardno GS-AECOM Pacific Joint Venture Local Office: Stantec GS Inc. 737 Bishop Street, Suite 3050 Honolulu, HI 96813 Contact: Michele Lefebvre Phone: 808-791-9872 Email: info@PMRF-KPGO-EIS.com	
Location:	County of Kauaʻi, Hawaiʻi	
District:	Waimea	
Tax Map Keys:	(4) 1-2-002:001, (4) 1-2-002:012, (4) 1-2-002:015, (4) 1-2-002:027, (4) 1-2-002:028, (4) 1-2-001:006, (4) 1-2-016:011, (4) 1-4-001:999, (4) 1-2-002:029, (4) 1-2-002:030, (4) 2-1-003:018, (4) 1-2-001:001, (4) 1-2-002:024, (4) 1-2-002:025, (4) 1-2-002:026, (4) 1-4-001:002, (4) 1-4-001:013, (4) 1-4-001:014, (4) 1-2-002:013, (4) 1-2-001:010, (4) 1-2-002:010, (4) 1-2-002:011, (4) 1-4-001:013	
Land Area:	Navy lease area and easements: 8,348 acres	NASA lease area and easements: 23 acres
Recorded Fee Owner:	State of Hawaiʻi	
Existing Use:	Navy Uses: Antenna structures, ordnance storage/assembly facilities, missile tracking and surveillance facilities, water well, undeveloped land used for safety zone buffers, drainage management, roadways, and access to utilities	NASA Uses: Kōkeʻe Park Geophysical Observatory, antenna structures, data collection systems, and supportive infrastructure
State Land Use District:	Agricultural, Conservation	
Zoning:	Agricultural, Conservation, Open Space, Special Treatment – Ecological	
Flood Zone Designation:	A, AE, D, VE, X	

Proposed Action:	The Navy proposes to retain the use of 8,348 acres of State lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kaua‘i, Hawai‘i, in support of continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO).
HRS Chapter 343 Trigger(s):	Proposed use of state or county lands, propose any use within any land classified as a Conservation District

Project Summary:

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) as applicants and joint lead agencies have prepared this Environmental Impact Statement Preparation Notice (EISPN) and a separate Notice of Intent (NOI) to Prepare an Environmental Impact Statement (EIS) in accordance with the following: the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321 et seq.), as amended by the Fiscal Responsibility Act of 2023 (Public Law [P.L.] No. 118-5, div. C, tit. III, 321(b), 137 Stat. 10, 40 (amending NEPA § 107) (2023) (codified at 42 U.S.C. § 4336a); Council on Environmental Quality, Navy and NASA policies and regulations; and Hawai‘i Revised Statutes (HRS) Chapter 343 and Hawai‘i Administrative Rules (HAR) § 11-200.1. The Navy proposes to retain the use of 8,348 acres of State lands on Kaua‘i, Hawai‘i, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kaua‘i, Hawai‘i, in support of continued operations including measurements of the Earth’s rotation and local land motion at Kōke‘e Park Geophysical Observatory (KPGO). The Proposed Action is needed because the existing real estate agreements for these lands are set to expire between 2027 and 2030. The Navy and NASA are considering two action alternatives and the No Action Alternative. The Draft EIS will evaluate potential environmental impacts associated with these alternatives. The following resource areas are evaluated: archaeological and historic resources, cultural practices, biological resources, land use, socioeconomics, environmental justice, water resources, utilities, public health and safety, air quality and greenhouse gases, transportation, hazardous materials and wastes, and visual resources.

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement Preparation Notice

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Appendix A Summary of Land Use at the Pacific Missile Range Facility

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Appendix D Detailed List of Activities and Operational Elements Under Current Real Estate Agreements

Appendix E No Action Alternative: Detailed List of Activities/Operations Impacted

Abbreviations and Acronyms

ACHP	Advisory Council on Historic Preservation
AFFF	Aqueous Film Forming Foam
APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
AT	Anti-Terrorism
BMP	Best Management Practice
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CIA	Cultural Impact Assessment
CNRH	Commander, Navy Region Hawaiʻi
CO	Carbon Monoxide
COMNAVREG	Commander, Navy Region
CRM	Cultural Resources Management
CZMA	Coastal Zone Management Act
DAR	Division of Aquatic Resources
DHHL	State of Hawaiʻi Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DoD	Department of Defense
DOFAW	DLNR Division of Forestry and Wildlife
DOH	Hawaiʻi Department of Health
DORIS	Doppler Orbitography and Radio-positioning Integrated by Satellite
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
EO	Executive Order
ESA	Endangered Species Act
ESQD	Explosive Safety Quantity Distance
GHA	Ground Hazard Area
GHG	Greenhouse Gas
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
HAR	Hawaiʻi Administrative Rules
HEPA	Accepted Term for Hawaiʻi Revised Statutes Chapter 343
HRS	Hawaiʻi Revised Statutes
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
ITRF	International Terrestrial Reference Frame
KISC	Kauaʻi Invasive Species Committee
KPGO	Kōkeʻe Park Geophysical Observatory
MBTA	Migratory Bird Treaty Act
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NASA	National Aeronautics and Space Administration
Navy	Department of the Navy
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NRHP	National Register of Historic Places
O_3	Ozone
OPNAVINST	Office of the Chief of Naval Operations Instruction
PA	Programmatic Agreement
P.L.	Public Law
PCB	Polychlorinated Biphenyl
PFAS	Per- and Polyfluoroalkyl Substances
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter Less than or Equal to 2.5 Microns in Diameter
PM_{10}	Particulate Matter Less than or Equal to 10 Microns in Diameter
PMRF	Pacific Missile Range Facility
RADAR	Radio Detecting and Ranging

RDT&E	Research, development, test and evaluation
REPI	Readiness and Environmental Protection Integration
SECNAVINST	Secretary of the Navy Instruction
SGP	Space Geodesy Project
SHPD	State Historic Preservation Division
SHPO	State Historic Preservation Office
SLUD	State Land Use District
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SOS	Save Our Shearwaters
T&E	Test and Evaluation
U.S.	United States
U.S.C.	United States Code
USCB	United States Census Bureau
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VLBI	Very Long Baseline Interferometry

1 Purpose of and Need for the Proposed Action

This chapter provides the following: an introduction and overview of the project; the project location, background, purpose of and need for the Proposed Action; scope of analysis; relevant laws and regulations; and public and agency participation.

1.1 Project Introduction and Overview

The United States (U.S.) Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are joint lead agencies and are preparing a Draft Environmental Impact Statement (EIS) in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR) (Hawaiʻi Administrative Rules [HAR] § 11-200.1-23 (a)(4)). The EIS will evaluate the potential environmental consequences of the Navy's and NASA's proposal to retain the use of 8,348 acres and 23 acres, respectively, of State lands including leaseholds and easement lands on Kauaʻi, Hawaiʻi, for operational continuity and sustainment (in support of the military's continued and ongoing military training, testing, and facility operations) at the Pacific Missile Range Facility (PMRF), and NASA's continued operations including measurements of the Earth's rotation and local land motion at Kōkeʻe Park Geophysical Observatory (KPGO).

The Navy's current real estate agreements with DLNR include 684 acres of leaseholds and 7,664 acres of easement lands, for a total of 8,348 acres. These existing Navy real estate agreements with DLNR are set to expire between 2027 and 2030. The Navy's current leases and easements are primarily used for passive encroachment buffers, as well as for mission readiness (see Section 1.2 and Appendix D), access, and utilities at the following five general locations: Main Base, Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge. No ground-based training occurs on these parcels. The Navy's 8,348 acres of leaseholds and easement lands are part of the larger PMRF installation.

NASA's current real estate agreements with DLNR include 16 acres of leaseholds and 7 acres of easement lands, for a total of 23 acres. NASA uses the land for operations at KPGO that include collecting and coordinating geodetic data that contribute to daily measurements of the Earth's rotation and orientation in space. NASA issued the Navy a Use Permit in 2016 for portions of KPGO to conduct radar, telemetry, and communications services in support of PMRF operations. In addition to their mission operations, the Navy and NASA also conduct environmental management and stewardship activities on these lands.

These leases and easements collectively comprise the Project Area that will be analyzed in the EIS.

Figure 1-1 depicts an overview of general locations for PMRF and KPGO (Main Base, Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, Mākaha Ridge, and KPGO) on the Island of Kauaʻi. The Project Area includes leaseholds and easement lands within these locations; it does not include the 1,933 acres of federally owned fee simple lands.

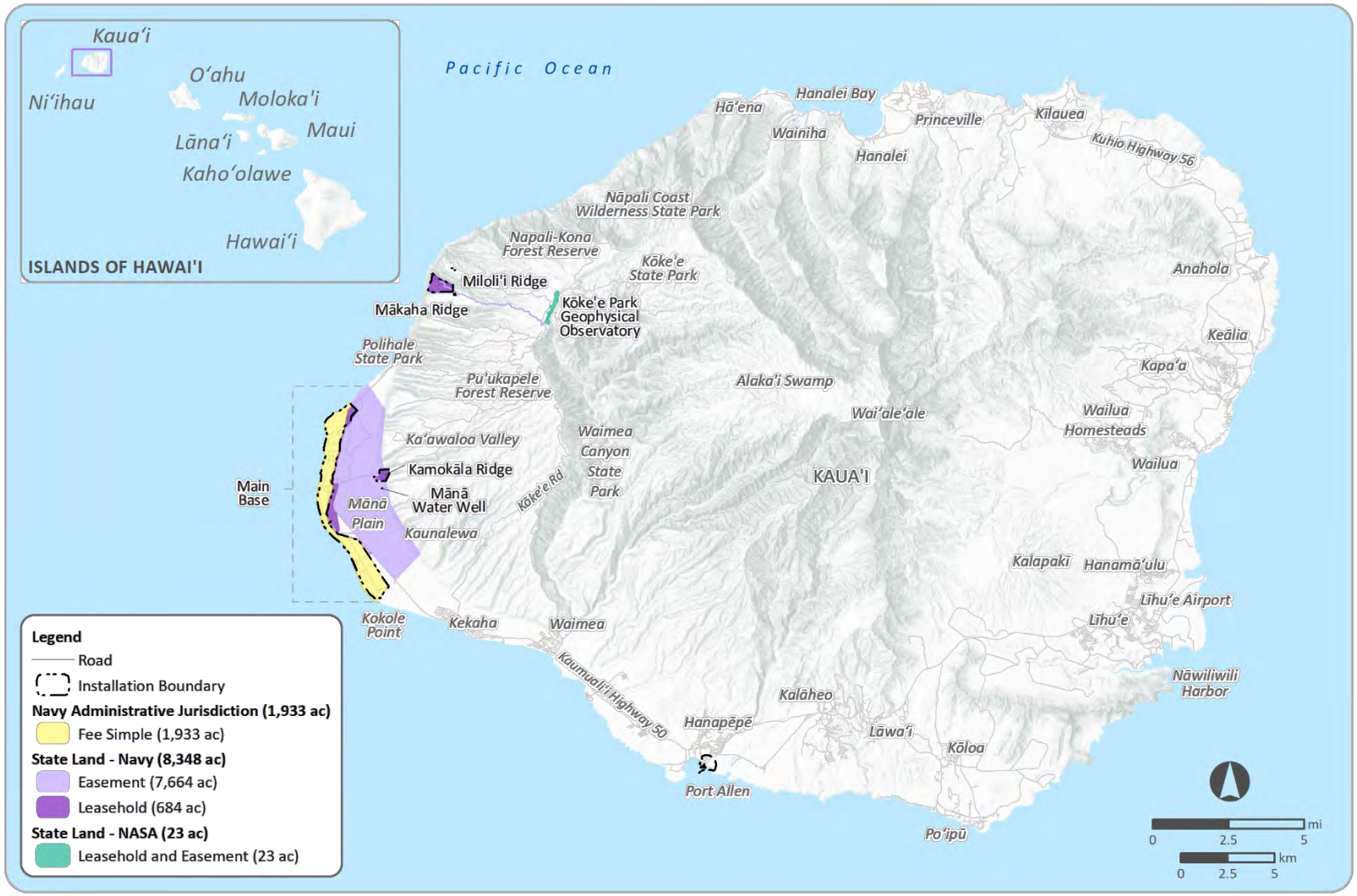

Figure 1-1 General Location

The Navy and NASA have jointly prepared this document and a separate Notice of Intent (NOI) to prepare an EIS in accordance with federal and state law including: the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321–4370), as amended by the Fiscal Responsibility Act of 2023 (Public Law [P.L.] No. 118-5 , div. C, tit. III, § 321(b), 137 Stat. 10, 40 (amending NEPA § 107) (2023) (codified at 42 U.S.C. § 4336a)); the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] §§ 1500–1508); Navy and NASA regulations and policies for implementing NEPA (32 CFR § 775, 14 CFR § 1216, OPNAVINST 5090.1E, and NPR 8580.1A, 32 CFR); all applicable federal environmental laws and agency guidance listed in Appendix B; Hawaiʻi Revised Statutes (HRS) Chapter 343 (the state law governing preparation of an EIS and commonly referred to as "HEPA"); and HAR § 11-200.1 (implementing HRS Chapter 343).

As requested by and in coordination with DLNR, the Navy and NASA identified that an EIS is the appropriate level of environmental review for the Proposed Action (HAR § 11-200.1-23 (a)(5)) (Lauren Yasaka e-mail message to Kerry Wells, email title: Lauren Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate EIS, January 18, 2024). HAR § 11-200.1-14(d)(2) supports this determination, which provides "[if the] proposing agency or approving agency determines, through its judgment and experience that an EIS is likely to be required, then the proposing agency may choose to prepare, or an approving agency may authorize an applicant to prepare, an EIS in accordance with subchapter 10, beginning with preparation of an EISPN." Additionally, due to the nature of the Proposed Action, the Navy and NASA concur with DLNR's determination that an EIS is likely to be required. An EIS also helps ensure that input from the public and agencies is integrated into the process of assessing environmental impacts of the Proposed Action and conducting fully informed decision making.

DLNR's mission is to "[e]nhance, protect, conserve and manage Hawaiʻi's unique and limited natural, cultural and historic resources held in public trust for current and future generations of the people of Hawaiʻi nei, and its visitors, in partnership with others from the public and private sectors" (Hawaiʻi DLNR, 2024). DLNR is also responsible for issuing and managing leases of State lands (agricultural, pasture, commercial, industrial, governmental, and resort leases). DLNR's responsibilities include managing and maintaining the state's coastal lands and waters, water resources, conservation and forestry lands, historic sites, small boat harbors, parks, and recreational facilities. DLNR also performs public safety duties (e.g., flood and rockfall prevention), maintains unencumbered public lands, and enforces the agency's rules and regulations.

For this Proposed Action, DLNR is responsible for issuing leases and easements to the Navy and NASA. DLNR is the agency with the responsibility for approving the real estate action since the State lands are under the management of DLNR's Land Division. DLNR is required to conduct an environmental review of this Proposed Action because the Navy and NASA are proposing the continued use of State lands (HRS § 343-5(a)(1), (2), (4)). Pursuant to HRS § 343-5(h): "[w]henever an action is subject to both the National Environmental Policy Act of 1969 (Public Law 91-190) and the requirements of this chapter, [DLNR] shall cooperate with federal agencies to the fullest extent possible to reduce duplication between federal and state requirements. Such cooperation, to the fullest extent possible, shall include joint environmental impact statements with concurrent public review and processing at both levels of government. Where federal law has environmental impact statement requirements in addition to but not in conflict with this chapter, [DLNR] and agencies shall cooperate in fulfilling these requirements so that one document shall comply with all applicable laws." Under HAR § 11-200.1-28, DLNR, as the accepting authority for HEPA,

evaluates whether the EIS fulfills the intent of HRS Chapter 343. In addition, during review of the EIS, DLNR will consider HRS Title 12, Chapter 171 (Hawaiʻi's land lease law).

1.2 Project Area

PMRF is located approximately 100 miles from Oʻahu on the northwest coast of the Hawaiian island of Kauaʻi (refer to Figure 1-1). KPGO is located within Kōkeʻe State Park on the island of Kauaʻi, at an elevation of approximately 3,600 feet above sea level near Waimea Canyon.

The Project Area overview is shown in Figure 1-2. Current real estate details for the Main Base, Kamokalā Ridge, and Mānā Water Well portions of the Project Area are shown in Figure 1-3. Mākaha, Miloliʻi Ridge, and KPGO portions of the Project Area are shown in Figure 1-4.

The Project Area consists of the following:

- Main Base: leaseholds (392 acres) and easement lands (7,267 acres), located adjacent to the fee-simple lands at the installation, used for PMRF operational support, utilities and flood control, and as safety buffers;
- Kamokalā Ridge: leaseholds (89 acres) and easement lands (355 acres) used for ordnance storage, utilities access, and tsunami evacuation;
- Mānā Water Well: leaseholds (0.29 acre) used as the primary potable water source for PMRF;
- Mākaha Ridge: leaseholds (203 acres) and easement lands (42 acres) used for missile tracking and surveillance;
- Miloliʻi Ridge: leaseholds (0.015 acre) used for radar and telemetry activities; and
- KPGO: leaseholds (16 acres) and easement lands (7 acres) used for surveillance and tracking, as well as NASA geodetic data collection and backup power generation.

1.3 Background

1.3.1 Historic Land Use at PMRF

The history of the Mānā Plain is complex, with the earliest known traditional Hawaiian archaeological site at PMRF dating to the eleventh century (NAVFAC Pacific, 2012). Appendix A provides a more detailed summary of land use history at PMRF.

Traditionally, the people of Mānā were noted as fishermen. It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain, where houses, temples, and agricultural complexes were built in the foothills at the base of the cliffs, on high ground overlooking the wetlands and coastline. Small seasonal fishing communities were scattered along the coast. The people of Mānā developed and maintained brackish water loko puʻuone fishponds in the wetlands of the Mānā Plain. Inland of the wetlands, they grew sweet potatoes and gourds on the fertile strip of land at the foot of the pali. The coastal dunes of the Mānā Plain, particularly at Nohili, were the burial grounds of ancient Hawaiians. Several important heiau were located at Mānā. These heiau include Polihale, where rites associated with departing souls were conducted, and ʻElekuna, which King Kalakaua and his priests visited many times in the nineteenth century.

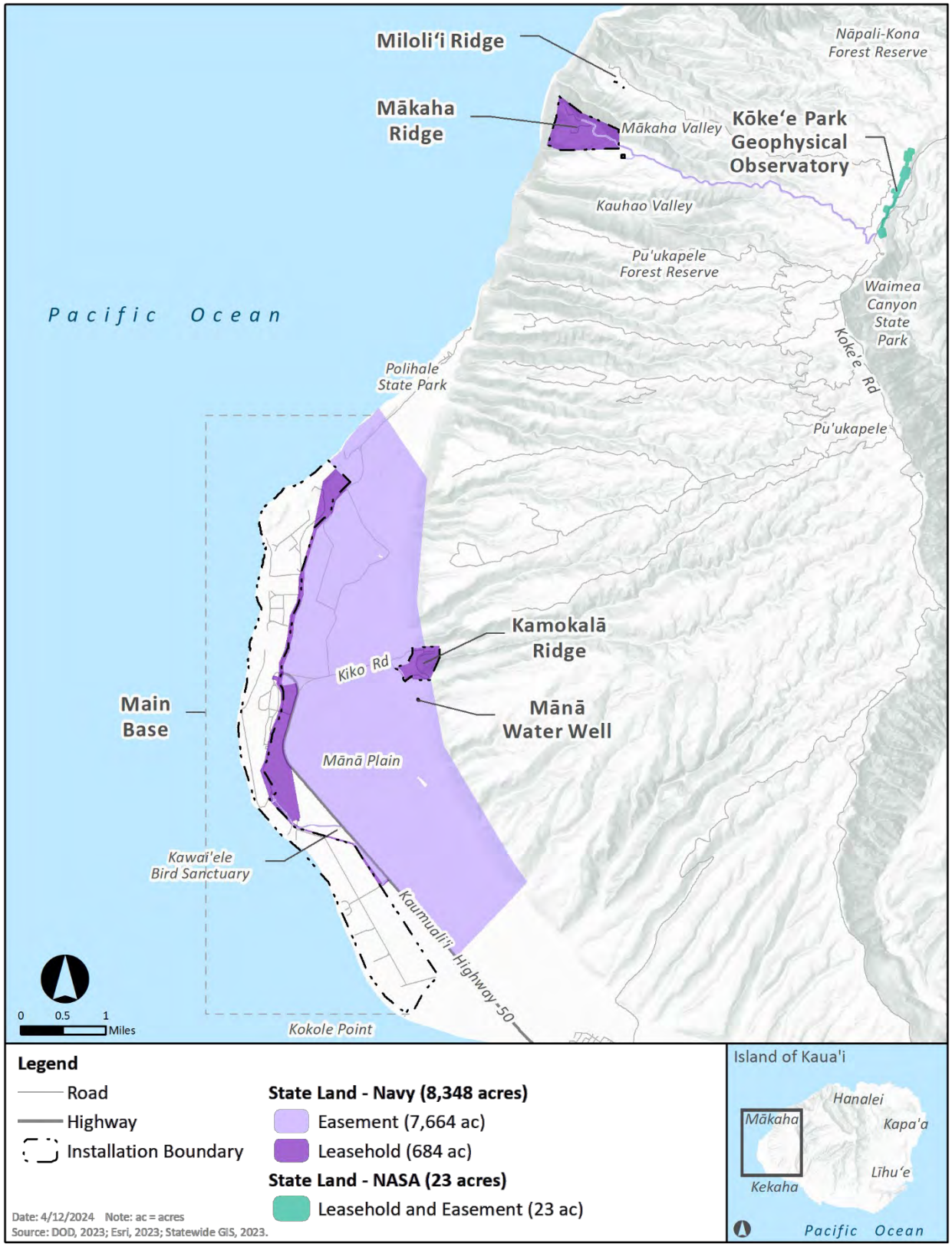

Figure 1-2 Project Area: Overview

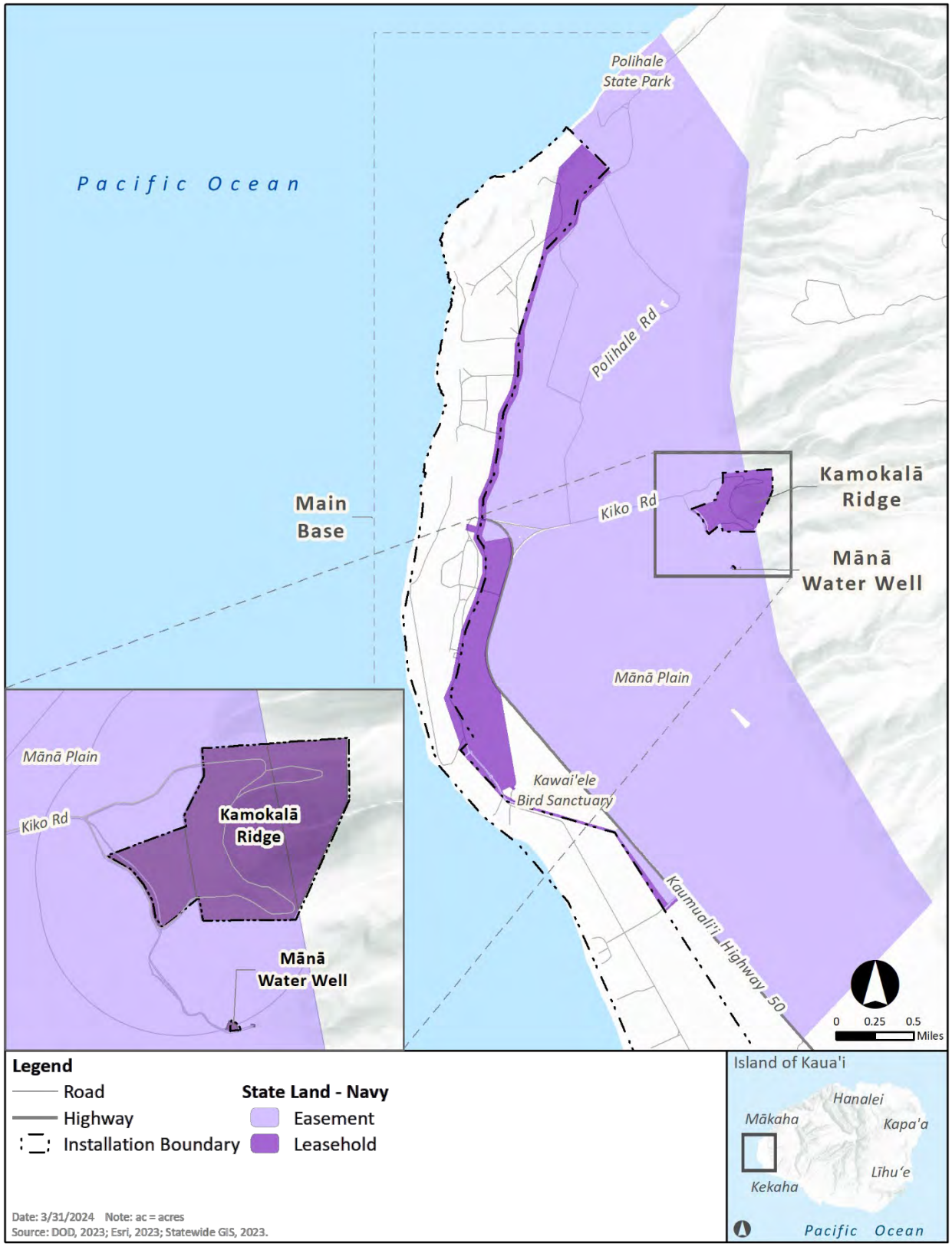

Figure 1-3 Project Area: Main Base, Kamokalā, and Mānā Water Well

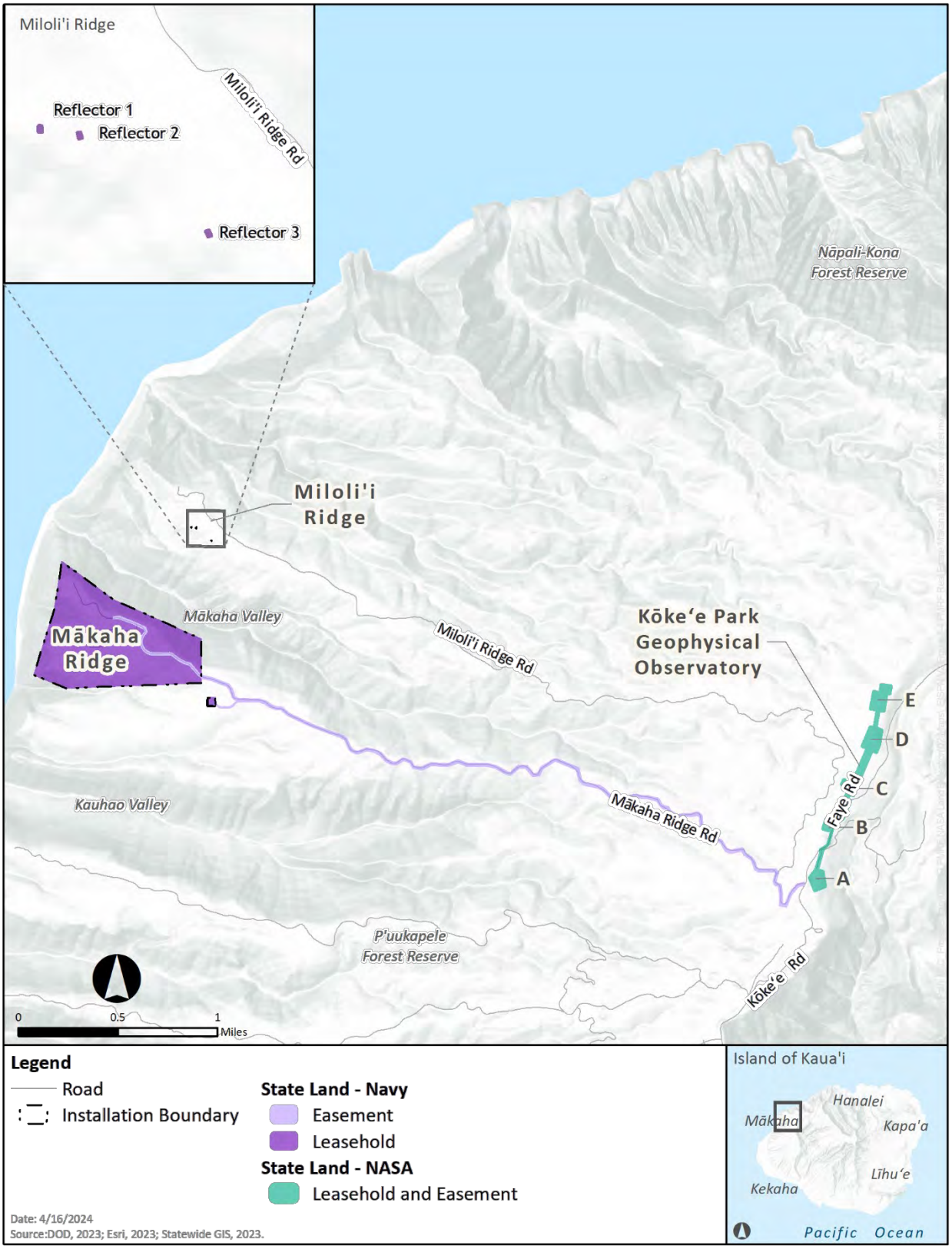

Figure 1-4 Project Area: Mākaha Ridge, Miloli'i Ridge, and KPGO

The Māhele of 1848 placed the ahupuaʻa of Waimea, including the Mānā Plain, into the possession of the Crown, and shortly afterwards the Crown leased these lands for commercial agriculture, such as livestock grazing, rice production, and sugarcane cultivation. As these agricultural ventures grew over the next three decades, contract laborers from China, then Japan, and finally the Philippines were brought to the area. Plantation camps were built to house the laborers. Mānā Camp eventually included a school, three stores, a company office, and a post office. Much of the wetlands were drained or filled to create more arable land for sugarcane cultivation under the Kekaha Sugar Company, Ltd., which was formed in 1898. Commercial sugarcane cultivation continued through the twentieth century.

In the 1920s, an airstrip was built by the Territory of Hawaiʻi. Beginning in 1940, the U.S. military acquired the airstrip and surrounding land to develop Barking Sands Army Air Base. During World War II, units from all branches of the armed forces and the Hawaiʻi National Guard were assigned to the base. The base was transferred to the Air Force in 1948. During the 1950s, the facility was redesignated Bonham Air Force Base, and the Navy, as a tenant of the base, began testing, evaluating, and training sailors on using guided missile systems. In 1958, the Navy's activity was named the Pacific Missile Range Facility as part of a newly designated larger Pacific Missile Range used by the Department of Defense (DoD) and NASA (NAVFAC Pacific, 2012). It was during this period that the Air Force transferred Bonham Air Force Base (which had been redesignated Bonham Auxiliary Landing Field) to the Navy. The transfer was finalized in 1966, at which time the entire installation became PMRF. A more detailed history of land use at PMRF is in Appendix A.

1.3.2 Historic Land Use at KPGO

Desktop and documentary research for historic land use at KPGO is ongoing. The Draft EIS will include additional information on historic land use at KPGO.

1.3.3 Navy Mission at PMRF

PMRF is the world's largest instrumented multi-environment range, capable of simultaneously supporting surface, subsurface, air, and space operations. As a Major Range and Test Facility Base, PMRF is part of the designated core set of DoD Test and Evaluation (T&E) infrastructure and associated workforce components that must be preserved as a national asset to provide T&E capabilities to support the DoD acquisition system. PMRF's unique location includes broad ocean areas to the north, south, and west with a relatively isolated and encroachment-free environment that safely and effectively supports these operations, as well as Navy Fleet training, as analyzed in the NEPA document titled *Hawaii-Southern California Training and Testing Final EIS/OEIS* (Navy, 2018).

The Navy's primary military mission at PMRF is to provide integrated range services in a modern, multi-threat, multi-dimensional environment that ensures the safe evaluation and execution of research, development, test and evaluation (RDT&E) missions. These capabilities are critical for DoD's ability to achieve its statutory Title 10 military readiness requirements[1], to provide commercial entities with the ability to conduct commercial T&E activities (see 10 U.S.C. § 4175 providing for the use of T&E installations by commercial entities), and Title 51 national and commercial space program requirements

[1] The legal basis for the roles, missions, and organization of each of the services are set forth in 10 U.S.C. § 7062 (Army), 10 U.S.C. § 8062 (Navy), 10 U.S.C. § 8063 (Marine Corps), 10 U.S.C. § 9062 (Air Force), and 10 U.S.C. § 9082 (Space Force).

by supporting commercial space activities (see 51 U.S.C. §§ 50504, 50901—50909 authorizing commercial space launch and reentry activities).

Activities at PMRF are monitored with real-time tracking and command/control capabilities located at or connected to the land-based PMRF facilities. This unique facility provides a realistic environment for training and testing in the use of surface, subsurface, air, and space weapons systems as well as land-based weapons systems located at the Main Base. The Navy conducts missile systems tests and has supporting facilities to track and evaluate these tests from the ocean floor to the outer atmosphere.

PMRF's space, air, surface, and subsurface tracking are accomplished from radar sites at multiple elevations. PMRF is linked to other range and data-processing facilities and can transmit real-time training and testing data anywhere in the world. The Navy, Air Force, Army, Marine Corps, allied foreign forces' RDT&E programs, and other non-DoD agencies (including NASA and commercial entities), all utilize PMRF's unique capabilities.

On Kaua'i, the Navy is the largest high-tech employer and third largest overall employer. It employs approximately 900 military and civilian personnel and contributes approximately $150 million annually in salary, contract goods, and services to the local economy. Moreover, as described in Section 1.3.6, *Environmental Management and Stewardship*, the Navy actively manages the natural and cultural resources at PMRF for the leased and easement lands.

1.3.4 NASA KPGO Space Geodesy Mission

Geodesy is the science of the Earth's shape, orientation in space, and gravity, and underpins modern navigation technology such as the Global Positioning System (GPS) that is used every day in a wide variety of devices, from handheld smartphones to satellites. NASA's Space Geodesy Project (SGP) was initiated to develop and maintain a global network of space geodetic observing instruments. The network is composed of core sites around the world that use four primary space-geodetic observation platforms: the Very Long Baseline Interferometry (VLBI), the Satellite Laser Ranging, the Doppler Orbitography by Radiopositioning Integrated on Satellite (DORIS), and the Global Navigation Satellite System (GNSS). The SGP maintains the International Terrestrial Reference Frame (ITRF), which is the foundation for virtually all Earth observations and georeferenced data used by society. Additionally, the SGP is fundamental for spacecraft tracking, as well as terrestrial, airborne, and maritime navigation. The scientific disciplines that rely on these data include sea level change, earthquake early warning systems, volcano deformation, flooding patterns, and glacier dynamics.

One of the core sites for NASA's SGP is KPGO, located within the Kōke'e State Park. The observatory sits at an elevation of approximately 3,600 feet above sea level near Waimea Canyon. KPGO is composed of five sites (Sites A through E), all of which have differing technologies and supportive infrastructure to collectively aid in the observatory's responsibilities. The mission of KPGO is to host three of the four primary geodetic platforms of NASA's SGP: VLBI, DORIS, and GNSS. KPGO collects these geodetic data to support satellites globally, and is a critical component of the SGP as part of its global network of space geodetic observatories.

KPGO consists of 16 acres of State leaseholds and 7 acres of easement lands (see Figure 1-4). The Navy holds a Use Permit and Memorandum of Understanding with NASA for portions of KPGO to utilize

NASA's facilities for the purpose of conducting PMRF mission support with radar, telemetry, and communications services at the NASA facilities.

1.3.5 Navy and NASA Use of State Lands

The Navy and NASA began leasing property on Kaua'i from the State of Hawai'i in 1964 and 1965, respectively. The Navy required the land to develop sophisticated testing, evaluation, and training of military weapons systems at PMRF. Since then, PMRF's mission has expanded in response to new technologies and geopolitical threats. NASA's lease began in 1965 when KPGO was part of the NASA Manned Space Flight Network. Since that time, KPGO has supported many NASA and other projects with a variety of equipment. It is a highly versatile and multifunctional geodetic site.

Navy and NASA uses of the lease and easement areas that will be analyzed in the EIS are summarized in Table 1-1 and depicted in Figures 1-3 and 1-4. Appendix D includes details about Navy and NASA activities at KPGO (see Figure 1-4). A detailed and current list of leases and easement uses is included in Appendix D with a description of current activities and operational elements.

Table 1-1 Navy and NASA Activities on Leaseholds and Easement Lands

Area[1]	*Agency*	*Description of Activities*	*Figure Number*
Main Base	Navy	The Main Base includes the following: 1,933 acres of fee simple land, 392 acres of leaseholds, and 7,267 acres of easement lands. The systems that support activities on the Main Base are integrated across fee simple land, leaseholds, and easements. The Main Base is the principal operations area for PMRF and supports surface, subsurface, air, and space activities. Activities on the leased parcels at the Main Base include ordnance assembly, operation and maintenance of drainage ditches and pumps to protect adjacent land from flooding, travel along roadways, and accessing utilities. Additionally, undeveloped land serves as safety zone buffers for missile/target launch operations and explosives safety. GHA safety arcs have a radius between 6,000 and 10,000 feet from the missile launch location; the public is excluded from being within this area prior to, during, and immediately following a launch. For the portion of the GHA on leased lands adjacent to the Main Base, the Navy works with DLNR Division of State Parks to establish safety controls during missile launches and restricts entry to the southern portion of Polihale Beach Park prior to launches. Explosives storage and munitions assembly locations have ESQD arcs for explosives safety zones based on quantities and types of ammunition stored in magazines, being transported, and staged on ordnance handling pads. ESQD arcs overlay ground areas of restricted non-ammunition-related facilities and activities located on an easement subject to a MOA with DLNR.	1-3
Kamokalā Ridge	Navy	Kamokalā Ridge includes 444 acres consisting of the following: 89 acres of leaseholds and 355 acres of easement lands. Kamokalā Ridge provides ordnance storage for the Navy, Hawai‘i Air National Guard, Department of Energy, and other military commands with requirements for training and storage. The site consists of ordnance storage magazines that have been excavated into the cliff face of Kamokalā Ridge. The magazines provide secure storage for Class 1.1 explosives. Activities on easements at Kamokalā Ridge include roadways to access utilities and ordnance storage. This area also serves as a tsunami evacuation site.	1-3

Area[1]	*Agency*	*Description of Activities*	*Figure Number*
Mānā Water Well	Navy	The Mānā Water Well includes 0.29 acre of leaseholds. Activities on leased land include maintenance and use of the Mānā Water Well, which is the primary source of potable water for PMRF and critical to all activities at the facility.	1-3
Miloliʻi Ridge	Navy	Miloliʻi Ridge includes 0.015 acre of leaseholds. Activities at Miloliʻi Ridge leaseholds include passive use of the frequency shift reflectors (a specific type of antenna system), which work with the radar and telemetry stations on Mākaha Ridge. The reflectors help calibrate and operate the radar systems used at the Main Base.	1-4
Mākaha Ridge	Navy	Mākaha Ridge consists of 245 acres composed of 203 acres of leaseholds and 42 acres of easement lands. The Mākaha Ridge Tracking Station serves as PMRF's secondary missile tracking and surveillance station. The station has tracking and surveillance radars as well as primary telemetry systems for the range. The site is also used by other agencies to test new radar technologies. Due to the sensitivities of the technology and the erosion rate at Mākaha Ridge, public access is restricted at this location. Activities on easement lands at Mākaha Ridge include roadways to and around the features.	1-4
KPGO	Navy and NASA	KPGO consists of 16 acres of leaseholds and 7 acres of easement lands. The Navy has a Use Permit for Sites A through D which support surveillance and tracking. Navy infrastructure at KPGO supports tracking radars as well as command and control systems. Sites A through E support KPGO activities which include collecting and coordinating geodetic data and contributing to daily measurements of the Earth's orientation in space and rotation. The diesel generator at Site B provides backup power to Sites A, C, D, and E.	1-4

Note: [1]See Figures 1-3 and 1-4.

Key: DLNR = Department of Land and Natural Resources; ESQD = Explosive Safety Quantity-Distance; GHA = Ground Hazard Area; KPGO = Kōkeʻe Park Geophysical Observatory; MOA = Memorandum of Agreement; NASA = National Aeronautics and Space Administration; PMRF = Pacific Missile Range Facility.

1.3.6 Environmental Management and Stewardship

The Navy manages natural and cultural resources on PMRF including leased and easement lands. Conservation management of natural and cultural resources is a priority for both stewardship and mission readiness. This includes activities such as protecting the endangered Hawaiian monk seal (*Neomonachus schauinslandi*), green sea turtle (*Chelonia mydas*), wetlands, archaeological sites, iwi kupuna (sensitive human remains), and historic buildings and structures. The Navy also protects natural and cultural resources, including native Hawaiian sacred resources, against encroachment. PMRF's awareness of the importance of Native Hawaiian cultural values is embodied in PMRF's slogan: E Pane Mai Ka Nonoi O Nohili – Answering the Requests of Nohili.

Table 1-2 lists Navy funded and managed natural and cultural programs on State lands.

Table 1-2 Navy Programs on State Lands

Program	*Description*
REPI Projects	Mitigation for the effects of sea level rise on agricultural land on the Mānā Plain by: • creating an open floodable space to reduce the quantity and improve the quality of stormwater runoff discharged from agricultural drainage ditches into the nearshore environment at PMRF; • reducing the threat erosion poses to PMRF infrastructure; and • promoting the regeneration of historic wetland habitat for endemic and endangered Hawaiian waterbirds. https://www.repi.mil/Portals/44/Documents/Buffer_Fact_Sheets/Navy/PMRF_BarkingSands.pdf
PMRF INRMP	Natural resource management that includes erosion management, invasive plant management, native plant management, federally listed plant species management (at Mākaha Ridge), wildland fire management, nuisance and invasive animal management, special-status species management, terrestrial invertebrate and pollinator management, data collection, database and records management, outdoor recreation, and natural resources awareness, education, and training.
PMRF ICRMP	Cultural resource management, including implementation of the cultural resources management program and oversight of all cultural resource operations and activities at the range. Nohili Dunes, at the Main Base, is a spiritual place for Native Hawaiians where their ancestors were buried as an ascending point to lani (heaven). The Navy, in collaboration with Na ʻOhana Papa O Mana, respectfully re-inters exposed remains in the Lua Kupapau O Nohili crypt located on base.
Agricultural Preservation Initiative	Ensures agricultural land areas surrounding the installation remain in agricultural use, which is compatible with PMRF operations.

Key: ICRMP = Integrated Cultural Resources Management Plan; INRMP = Integrated Natural Resources Management Plan; PMRF = Pacific Missile Range Facility; REPI = Readiness and Environmental Protection Integration.

Specific Navy environmental stewardship activities that occur on leased and easement lands at PMRF and KPGO are presented in detail in Section 2.5, *Best Management Practices* (see Table 2-6), and include:

- Responding to requests for public access and for cultural access to individuals and organizations.
- Maintaining ungulate exclusion fencing for erosion control at Mākaha Ridge.
- Out-planting and managing native plants in areas identified as having erosion and soil compaction issues.
- Improving and protecting habitat for the federally endangered Niʻihau panicgrass (*Panicum niihauense*) and Hawaiian picture-wing fly (*Drosophila musaphilia* and *D. sharpi*).
- Continuing predator control to protect Migratory Bird Treaty Act (MBTA)-listed species including Laysan albatross (*Phoebastria immutabilis*).
- Working with the PMRF Archery Club to control ungulate populations at the Kamokalā Ridge site.
- Conducting observations to identify feral cats at Kamokalā Ridge (with possibility of expanding cat trapping if necessary).

- Removing deadfall in high-risk fire areas including near the Main Base missile launch site and the Kamokalā Ridge Magazines and replanting with native, low fire risk species.
- Coordinating with U.S. Fish and Wildlife Service (USFWS), Division of Forestry and Wildlife (DOFAW), PMRF Air Ops, and PMRF Public Works to update and implement nēnē (*Branta sandvicensis*) management procedures.

See Chapter 2, Section 2.5 for a more detailed description of Navy and NASA Best Management Practices (BMPs) and management strategies for natural and cultural resources.

1.4 Purpose of and Need for the Proposed Action

The Navy's purpose of the Proposed Action is to maintain long-term DoD use of 8,348 acres of State lands (including leaseholds and easement lands) on Kaua'i, Hawai'i, for operational continuity and sustainment of the military readiness mission. NASA's purpose of the Proposed Action is to maintain long-term use of 23 acres of State lands (including leaseholds and easement lands) on Kaua'i for continued operations of KPGO. The Proposed Action is needed because the existing real estate agreements for these State lands are set to expire between 2027 and 2030. Preserving the long-term DoD and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global significance. It also ensures the continued conservation management by the Navy and NASA of natural and cultural resources on these lands.

For DLNR, in addition to its role as the lessor of State lands, the proposed real estate action presents an opportunity for the agency to secure a revenue source to support its management of public lands and associated environmental and conservation programs. Fees from leases and easements are put into a State fund as required by law.

By ensuring continued Navy and NASA operations on Kaua'i, the real estate action would also preserve local jobs and income for the residents of Kaua'i, financially contribute to the overall economic well-being of Kaua'i, and maintain continued conservation management of natural and cultural resources on State lands at no cost to the State of Hawai'i.

1.5 Scope of Environmental Analysis

The EIS will evaluate the potential environmental effects of the Proposed Action and alternatives that includes current activities that occur on leaseholds and easements, including the No Action Alternative. The EIS will satisfy both federal and State of Hawai'i requirements and provide the necessary analyses to allow the Navy, NASA, and DLNR to consider the environmental effects of the Proposed Action as part of their decision making.

Consistent with CEQ regulations and HAR § 11-200.1-24(b) the scope of the analysis for the alternatives in the EIS will be proportionate to the potential for environmental impacts.

1.6 Relevant Laws and Regulations

The Navy and NASA are preparing this EIS in accordance with applicable federal and State of Hawai'i laws, statutes, regulations, and policies applicable to implementation of the Proposed Action. A

description of the Proposed Action's consistency with these laws, policies, and regulations, as well as the names of regulatory agencies responsible for their implementation, is described in Appendix B.

1.7 Public and Agency Participation and Intergovernmental Coordination

Public participation is a key component of the EIS process (Figure 1-5). Opportunities for public input and participation in the EIS process occur during two stages:

1. During the scoping period, following the joint publication of the NOI (40 CFR 1501.7), and the Environmental Impact Statement Preparation Notice (EISPN) (HAR § 11-200.1-23); and
2. During the comment period following publication of the Draft EIS.

Figure 1-5 illustrates the stages of public involvement in the NEPA and HEPA environmental processes. Table 1-3 provides a summary of public engagement for these processes, and Appendix C provides a list of interested parties who were contacted as part of scoping. The public involvement processes for NEPA and HEPA for this EIS are running concurrently to meet the requirements of both State of Hawai'i and federal laws and regulations.

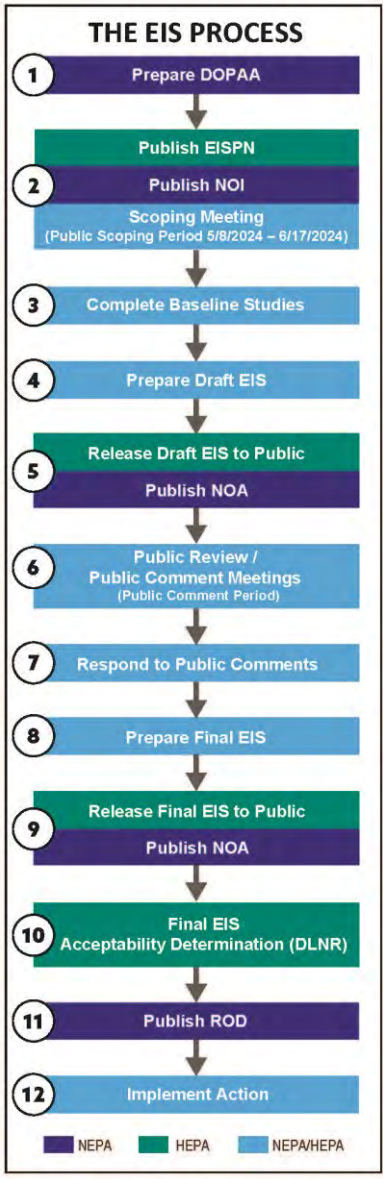

Figure 1-5 EIS Process

1.7.1 Scoping

Public scoping meetings during the scoping period for this EIS will be held on June 4, 5, and 6, 2024, from 5:00–8:00 p.m. at the Kaua'i Veterans Center in Līhu'e (3215 Kaua'i Veterans Memorial Highway, Līhu'e), Kekaha Neighborhood Center (8130 Elepaio Road, Kekaha), and Sheraton Kaua'i Coconut Beach Resort (650 Aleka Loop, Kapa'a), respectively (Table 1-3). Public scoping will serve as an opportunity to obtain input from the community, agencies, and other stakeholders regarding the issues and resources they would like to see addressed and analyzed throughout the EIS process, as well as identify reasonable alternatives. The public is invited to provide oral and written comments at the scoping meetings. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and HRS § 6E-42.

Methods to solicit public input during the scoping period for this EIS include notification, publication of project information, and invitations to participate in scoping. Additionally, a joint notice will be published on May 8, 2024, in *The Garden Island*, *MidWeek Kaua'i*, and *The Honolulu Star-Advertiser* announcing the publication of the EISPN and NOI and the date and time of the scoping meetings.

Table 1-3 Public Engagement under NEPA and HEPA

Date	*Description*
May 2024	Notification letters sent to stakeholders (individuals, agencies, and organizations)
May 2024	NOI published in the *Federal Register* (NEPA), EISPN Published in *The Environmental Notice* (HEPA)
May 2024	Public website available: http://www.PMRF-KPGO-EIS.com
June 2024	Public scoping meetings on Kaua‘i: Kekaha, Līhu‘e, and Kapa‘a
Summer 2025	• NOA of Draft EIS for public review • Public meetings for Draft EIS: Kekaha, Līhu‘e, and Kapa‘a • Draft EIS public review period closes
Winter 2025	Publication of NOA for Final EIS in the *Federal Register* (NEPA), Publication of Final EIS (NEPA, HEPA) and DLNR Decision in *The Environmental Notice* (HEPA)
Winter 2025	30-day wait period
Spring 2026	Publication of Record of Decision (NEPA)

Key: DLNR = Department of Land and Natural Resources; EIS = Environmental Impact Statement; EISPN = Environmental Impact Statement Preparation Notice; HEPA = Accepted Term for Hawai‘i Revised Statutes Chapter 343; NEPA = National Environmental Policy Act; NOA = Notice of Availability; NOI = Notice of Intent.

Letters with similar information will be sent to individual, agency, and organization stakeholders (Appendix C). Stakeholders consist of agencies with a regulatory role, individuals and organizations interested in the project, and elected officials whose jurisdiction includes PMRF and KPGO.

1.7.2 Draft EIS

All comments received during the public scoping period will be considered during EIS preparation. A summary of public comments and responses to substantive scoping comments will be provided in the Draft EIS.

1.7.3 Final EIS

Substantive public comments on the Draft EIS will be considered in the development of the Final EIS. A detailed summary of public comments, revisions made to the Draft EIS in response to comments, and responses to substantive comments will be provided in the Final EIS.

1.7.4 Intergovernmental Coordination

The Navy and NASA are consulting with USFWS and National Marine Fisheries Service (NMFS) in compliance with the Endangered Species Act (ESA) Section 7 for federally listed species. The Navy and NASA are coordinating with DLNR’s DOFAW regarding potential impacts to state-listed species pertaining to the leased lands under the Proposed Action. The Navy and NASA are also consulting with the Hawai‘i State Historic Preservation Officer (SHPO) as part of their NHPA requirements and coordinating with the DLNR, State Historic Preservation Division (SHPD) to satisfy HRS § 6E-42 requirements. The Navy is coordinating with the State of Hawai‘i Office of Planning and Sustainable Development, Planning Division under the Coastal Zone Management Act (CZMA). The Navy and NASA will coordinate with DLNR, Office of Conservation and Coastal Lands, as applicable, as part of any Conservation District Use Permit application. Applicable State of Hawai‘i and federal laws, regulations, and policies are described in Appendix B.

2 Proposed Action and Alternatives

This chapter includes a description of the Proposed Action, the screening factors used to determine reasonable alternatives, alternatives carried forward for analysis, alternatives considered but eliminated from detailed analysis, and BMPs included in the Proposed Action.

2.1 Proposed Action

The Navy proposes to retain the use of 8,348 acres of State land on Kaua‘i in support of continued and ongoing military training and testing at PMRF. NASA proposes to retain the use of 23 acres of State land on Kaua‘i in support of maintaining data collection efforts of global significance at KPGO. The Proposed Action includes current operations that occur on leased and easement lands.

2.2 Alternative Screening Process

NEPA’s implementing regulations provide guidance on the consideration of alternatives and require rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives that meet the purpose and need of the Proposed Action and are deemed reasonable following the application of alternatives screening criteria are carried forward for detailed analysis in the Draft EIS, as is the No Action Alternative.

For NEPA and HEPA, an EIS “shall describe in a separate and distinct section discussion of the alternative of No Action as well as reasonable alternatives that could attain the objectives of the action” (HAR § 11-200.1-24(h) and 40 CFR 1502.14(c), respectively).

The screening factors used to select reasonable alternatives that would allow the Navy and NASA missions to be fulfilled are:

1. Maintain long-term use of State land currently used to support DoD and NASA missions on Kaua‘i;
2. Preserve current DoD and NASA operations on Kaua‘i;
3. Retain existing DoD and NASA infrastructure on Kaua‘i; and
4. Support DLNR management of public lands and associated environmental and conservation programs on Kaua‘i.

All screening factors must be met for an alternative to be considered reasonable. Table 2-1 identifies the five alternatives considered.

Table 2-1 Description of Alternatives Identified

Alternative Name	*Alternative Description*
Alternative 1: Succeeding Current Real Estate Agreements	The Navy and NASA would apply to DLNR for new long-term real estate agreements in the same manner and for the same uses as the current leases and easements.
Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds	The Navy and NASA would pursue fee simple acquisition of 700 acres (684–Navy, 16–NASA) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1.
Alternative 3: No Action Alternative	The Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place (as determined by the existing real estate agreements), from the Navy and NASA leased and easement lands.
Alternatives Considered but Not Carried Forward for Detailed Analysis	
Succeeding Leases and Easements Except for Current Leases at Mākaha Ridge and KPGO	The Navy and NASA would obtain succeeding leases and easements on leased land not currently located in the State of Hawai‘i’s Conservation District. These would include leases at the Main Base, Kamokalā Ridge, Mānā Water Well, and Miloli‘i Ridge, but would not include succeeding leases or easements at Mākaha Ridge or KPGO.
Succeeding Leases Only with No Easements	The Navy and NASA would only obtain succeeding lease agreements and not succeeding easements. These would include succeeding leases at the Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, Mākaha Ridge, and KPGO, but not easements at the Main Base, Kamokalā Ridge, or Mākaha Ridge.

Key: DLNR = Department of Land and Natural Resources; KPGO = Kōke‘e Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; PMRF = Pacific Missile Range Facility.

Table 2-2 summarizes the application of the screening factors to these alternatives and the results. Two alternatives met all screening factors: (1) extend succeeding current real estate agreements in their present form, and (2) fee simple acquisition of all leased parcels. Section 2.3 includes a description of alternatives carried forward for detailed analysis and Section 2.4 includes a description of alternatives considered but eliminated from detailed analysis.

Table 2-2 Screening Evaluation Factors and Results

Screening Factors	*Alternatives Carried Forward for Detailed Analysis*			*Alternatives Considered but Not Carried Forward for Detailed Analysis*	
	Alternative 1: Succeeding Current Real Estate Agreements[1]	*Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds*[2]	*Alternative 3: No Action Alternative*[3]	*Succeeding Leases and Easements Except for Current Leases at Mākaha Ridge and KPGO*[4]	*Succeeding Leases Only (Current Easements are Not Renewed)*[5]
Maintain long-term use of State land currently used to support DoD and NASA missions on Kaua‘i	Yes	Yes	No	No	No
Preserve current DoD and NASA operations on Kaua‘i	Yes	Yes	No	No	No
Retain existing DoD and NASA infrastructure on Kaua‘i	Yes	Yes	No	No	No
Support DLNR management of public lands and associated environmental and conservation programs	Yes	Yes	Yes–with limitations	Yes	Yes–with limitations
Alternative Carried Forward	**Yes**	**Yes**	**Yes**[6]	**No**	**No**

Notes: See Section 2.3 for detailed analysis of alternatives carried forward and Section 2.4 for alternatives considered but eliminated from detailed analysis.
[1]See Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*.
[2]See Section 2.3.2, *Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds*.
[3]See Section 2.3.3, *Alternative 3: No Action Alternative*.
[4]See Section 2.4.1, *Succeeding Leases and Easements Except Current Leases at Mākaha Ridge and KPGO are Not Renewed.*
[5]See Section 2.4.2., *Succeeding Leases Only (Current Easements are Not Renewed).*
[6]Carried forward per NEPA and HEPA requirements.

Key: DLNR = Department of Land and Natural Resources; DoD = Department of Defense; KPGO = Kōke‘e Park Geophysical Observatory; NASA = National Aeronautics and Space Administration.

2.3 Alternatives Carried Forward for Detailed Analysis

The screening analysis resulted in two action alternatives (Alternatives 1 and 2), depicted in Figures 2--1 and 2-2. Alternative 3 is the No Action Alternative, which will be carried forward for analysis in the Draft EIS (Section 2.3.3, *No Action Alternative*) as required by NEPA and HEPA. This alternative is depicted in Figure 2-3.

A comparison of these alternatives is provided in Table 2-3, which lists the acres of leaseholds and easements under existing conditions.

2.3.1 Alternative 1: Succeeding Current Real Estate Agreements

Under this alternative, the Navy and NASA would apply to DLNR for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements (see Table 1-1 and Appendix D). The Navy's agreements would include 684 acres of land leased exclusively by the Navy and 7,664 acres of easements (for a total of 8,348 acres). NASA's agreements would include 16 acres of land leased exclusively by NASA, 7 acres of easement lands (for a total of 23 acres) and would continue its Use Permit with the Navy.

Securing the new real estate agreements from DLNR must occur prior to expiration of the current real estate agreements to ensure uninterrupted operation of all federal agency missions. Under this alternative, there are no proposed changes to the type or frequency of current activities occurring on state leased and easement lands. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities. This alternative would also preserve the Navy and NASA-funded natural and cultural resource management activities on the leased and easement lands.

The leased areas are currently used for safety buffers, Anti-Terrorism (AT) security requirements (Main Base), ordnance storage-related facilities (Kamokalā Ridge), potable water (Mānā Water Well), radar and telemetry related facilities (Miloliʻi and Mākaha Ridges), and data collection and tracking (KPGO). The easement areas are currently used for utilities, roadways, and as encroachment buffers for Navy activities on fee simple lands. Many of these easements also preserve existing land use and prevent incompatible development that would affect the ability of PMRF to meet its mission requirements.

Under this alternative, the Navy and NASA would maintain succeeding agreements for the current real estate agreements, and this alternative meets all screening factors (see Section 2.2, *Alternative Screening Process*).

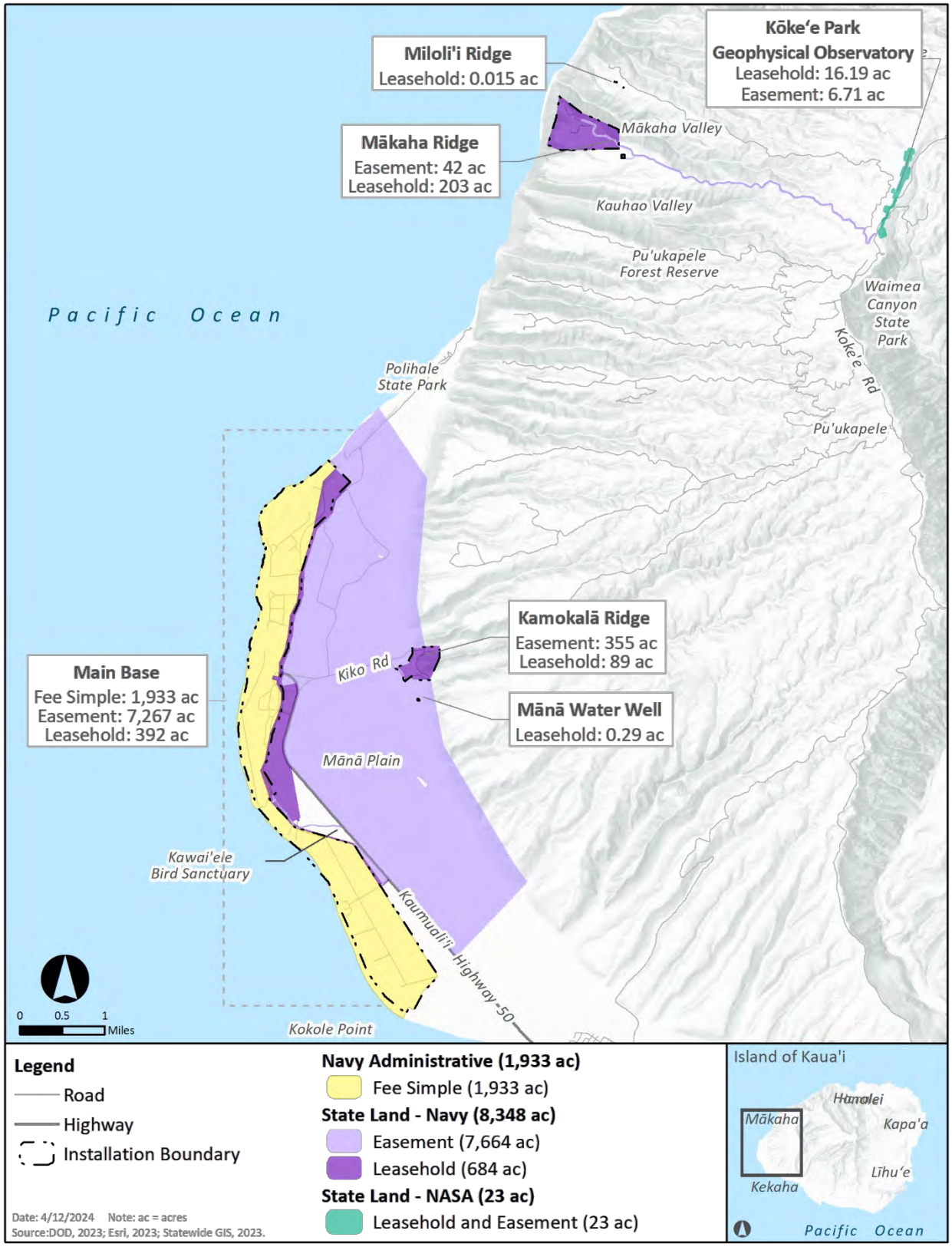

Figure 2-1 Alternative 1: Succeeding Current Real Estate Agreements

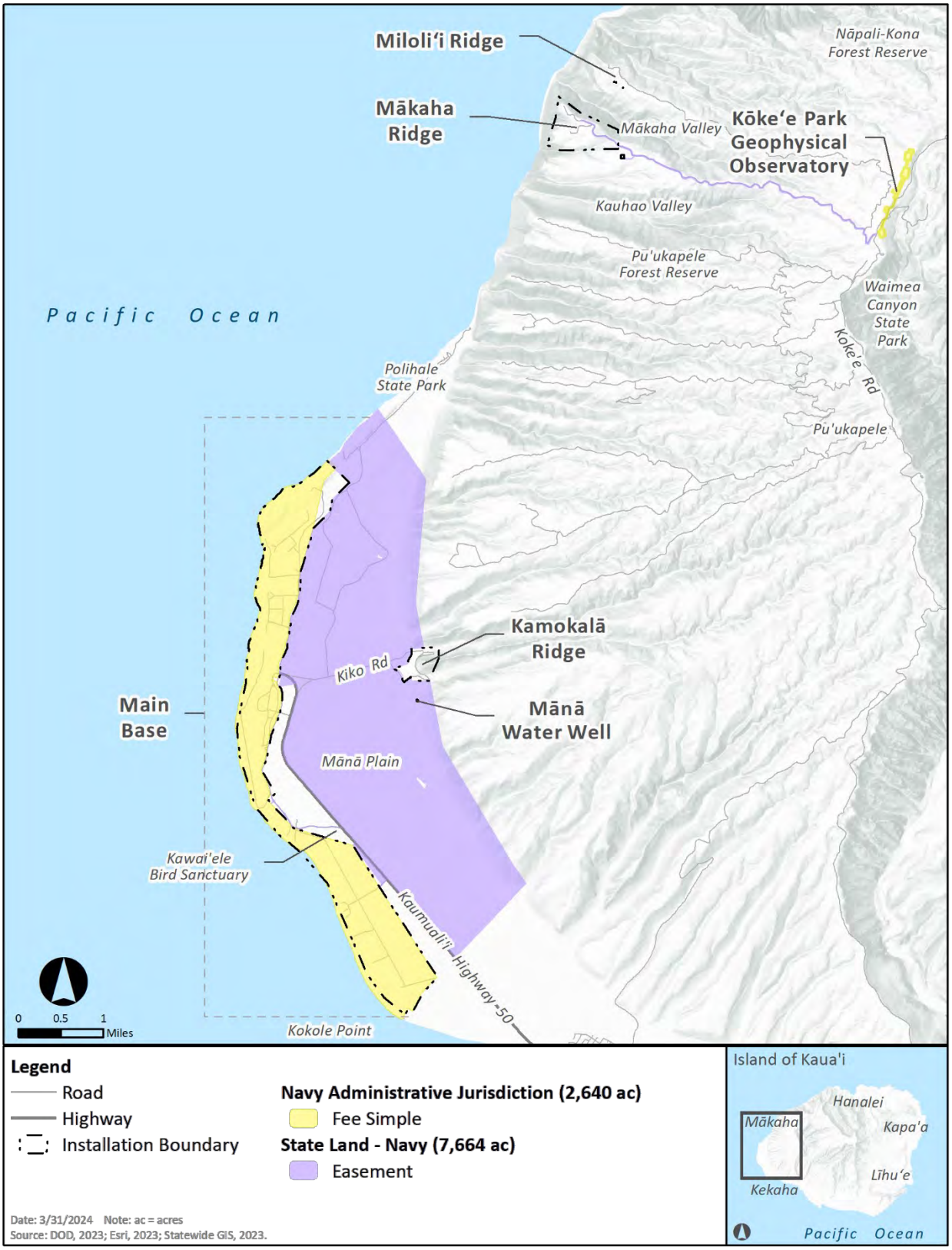

Figure 2-2 Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds

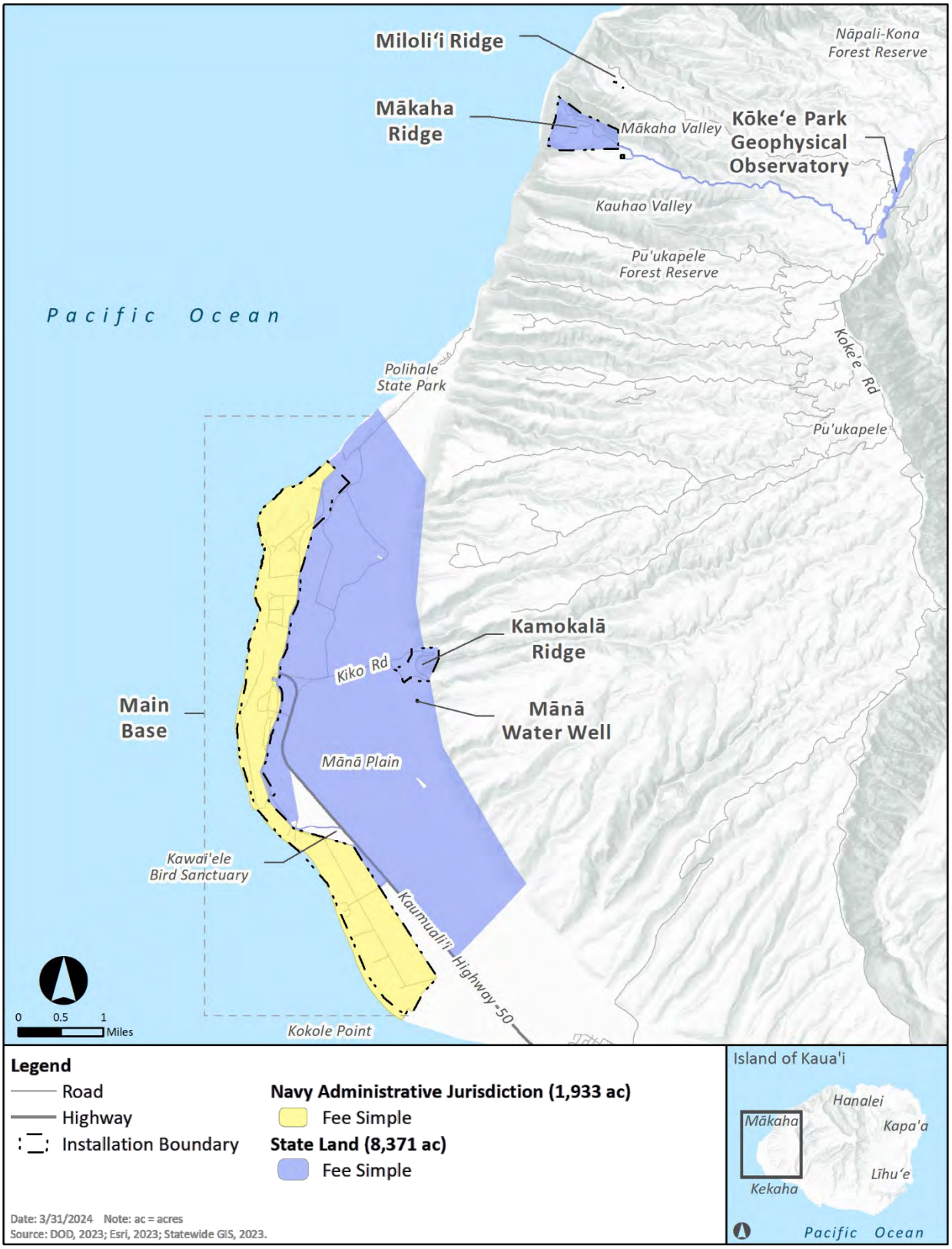

Figure 2-3 Alternative 3: No Action Alternative

Table 2-3 Comparison of Alternatives: Navy and NASA Land Status and Acreages by Location

Location	Existing Conditions/Alternative 1 (acres)				Alternative 2 (acres)				Alternative 3 (acres)			
	Lease-hold	Ease-ment	Fee Simple	Total	Lease-hold	Ease-ment	Fee Simple	Total	Lease-hold	Ease-ment	Fee Simple	Total
Navy												
Main Base	392	7,267	1,933	9,592	NA	7,267	2,325	9,592	NA	NA	1,933	1,933
Kamokalā Ridge	89	355	NA	444	NA	355	89	444	NA	NA	NA	NA
Mānā Water Well	0.29	NA	NA	0.29	NA	NA	0.29	0.29	NA	NA	NA	NA
Miloliʻi Ridge	0.015	NA	NA	0.015	NA	NA	0.015	0.015	NA	NA	NA	NA
Mākaha Ridge	203	42	NA	245	NA	42	203	245	NA	NA	NA	NA
Total	**684**	**7,664[1]**	**1,933**	**10,281**	**NA**	**7,664**	**2,617**	**10,281**	**NA**	**NA**	**1,933**	**1,933**
NASA												
KPGO	16	7	NA	23	NA	NA	23	23	NA	NA	NA	NA
Total	**16**	**7**	**NA**	**23**	**NA**	**NA**	**23**	**23**	**NA**	**NA**	**NA**	**NA**

Note: [1]7,664 acres includes 7,491 acres of Restrictive Use Easements and 173 acres of Utility and Roadway Easements.
Key: KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; NA = not applicable.

Under Alternative 1, in addition to the operational missions, Navy and NASA natural and cultural resource activities and responsibilities on these lands would continue as currently conducted (see Section 1.3, *Background*). This includes continued Navy funding and managing resource management actions and public use programs (see Section 1.3.6, *Environmental Management and Stewardship*); pursuing Readiness and Environmental Protection Integration (REPI) projects; continuing general natural resource management as identified in the PMRF Integrated Natural Resources Management Plan (INRMP); and continuing cultural resource management as identified in the PMRF Integrated Cultural Resources Management Plan (ICRMP).

Additionally, the Navy and NASA would continue to adhere to applicable federal and state laws as well as policies and regulations applicable to Navy and NASA regarding investigation, removal, and cleanup of hazardous and toxic materials and wastes.

The six locations are shown in Figure 2-4 (Main Base), Figure 2-5 (Kamokalā Ridge and Mānā Water Well), Figure 2-6 (Miloliʻi Ridge), Figure 2-7 (Mākaha Ridge), and Figure 2-8 (KPGO).

2.3.2 Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds

Under this alternative, the Navy and NASA would pursue fee simple acquisition of 700 acres (684 acres for Navy use and 16 acres for NASA use) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1. The new Navy fee simple land of 684 acres would include 392 acres of land at the Main Base, 89 acres at Kamokalā Ridge, 0.29 acre at the Mānā Water Well, 0.015 acre at Miloliʻi Ridge, 203 acres at Mākaha Ridge, and the NASA fee simple land would include 16 acres at KPGO. This acreage would be transferred from ownership by the State of Hawaiʻi to the United States.

This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities. The activities at these sites would continue as currently used (see Section 1.3, *Background* and Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*). The land would be managed in perpetuity by the Navy and NASA according to federal requirements. Under this alternative, Navy and NASA activities and responsibilities on these lands would continue as currently conducted (see Section 1.3, *Background* and the description above for Section 2.3.1, *Alternative 1: Succeeding Current Real Estate Agreements*). Under this alternative, the Navy would continue to operate at KPGO under the Use Permit with NASA.

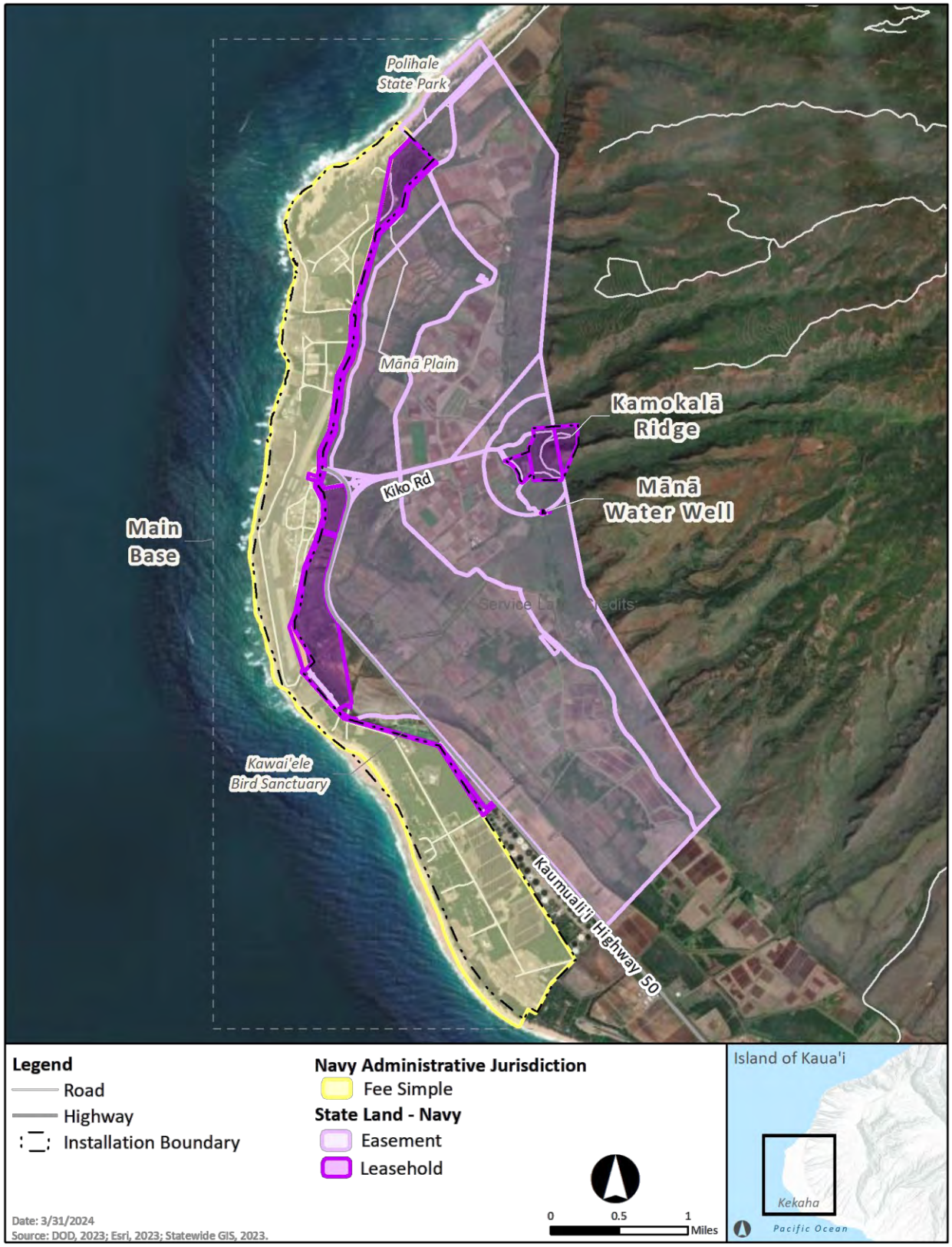

Figure 2-4 Alternative 1: Main Base: Aerial View

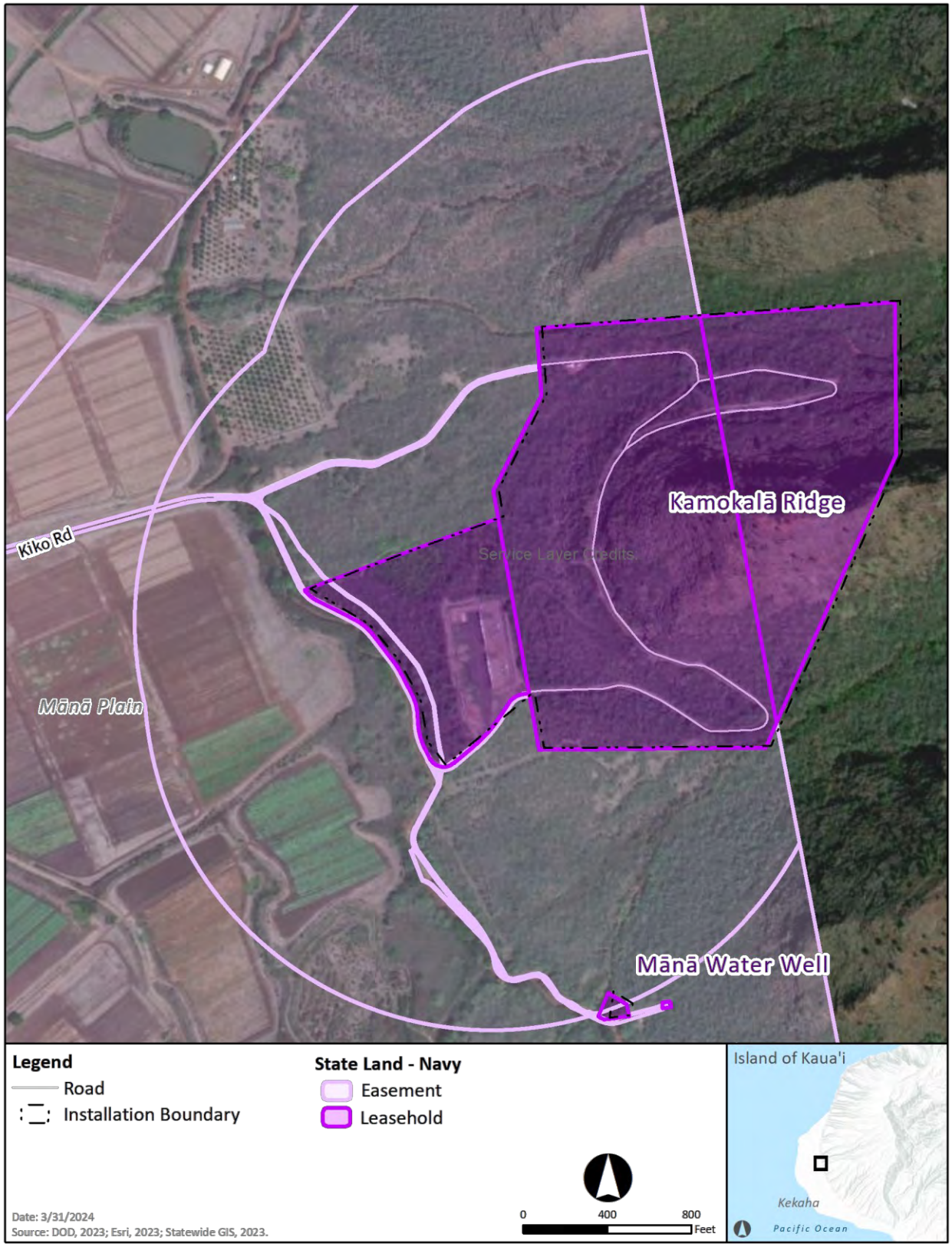

Figure 2-5 Alternative 1: Kamokalā Ridge and Mānā Water Well

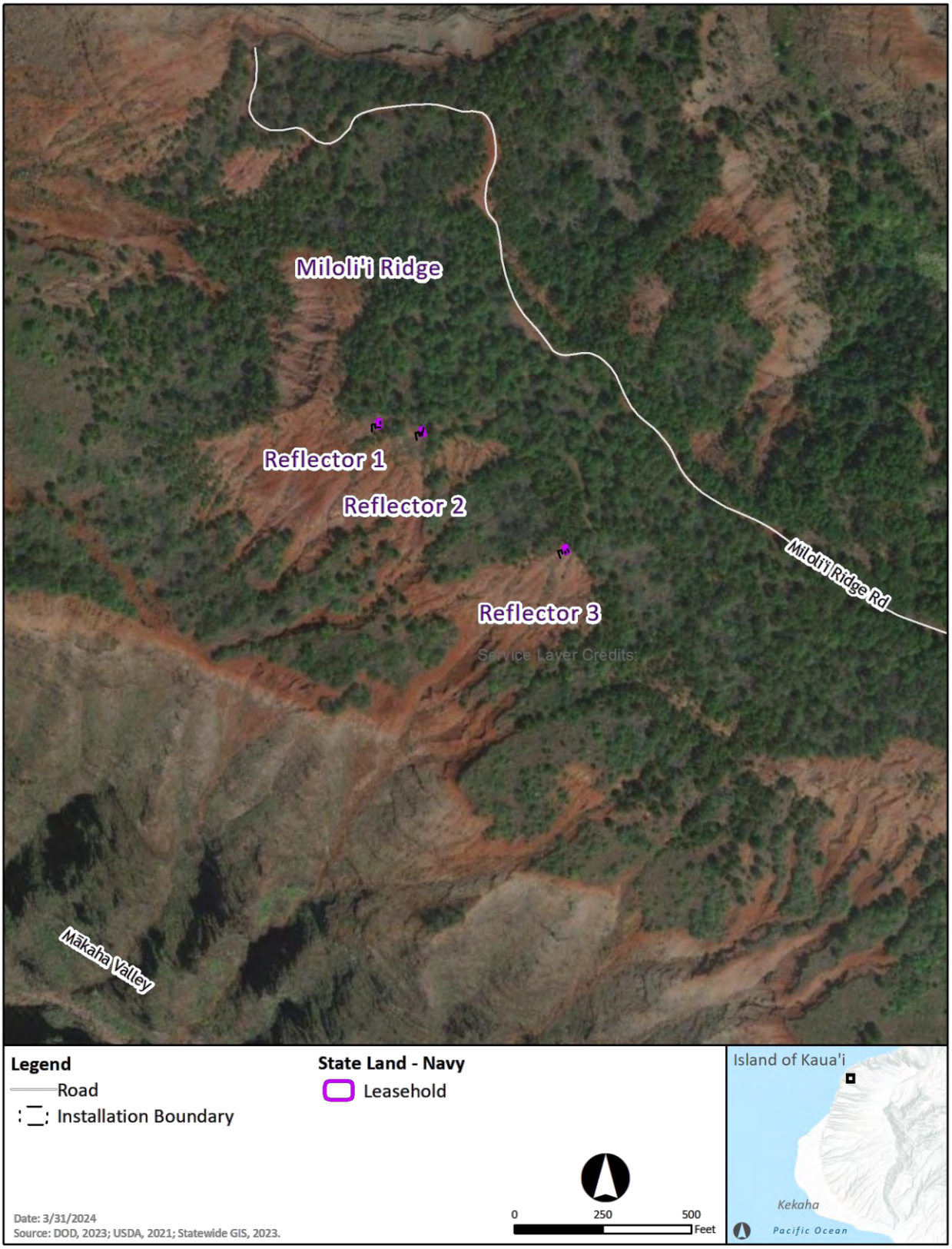

Figure 2-6 Alternative 1: Miloli‘i Ridge

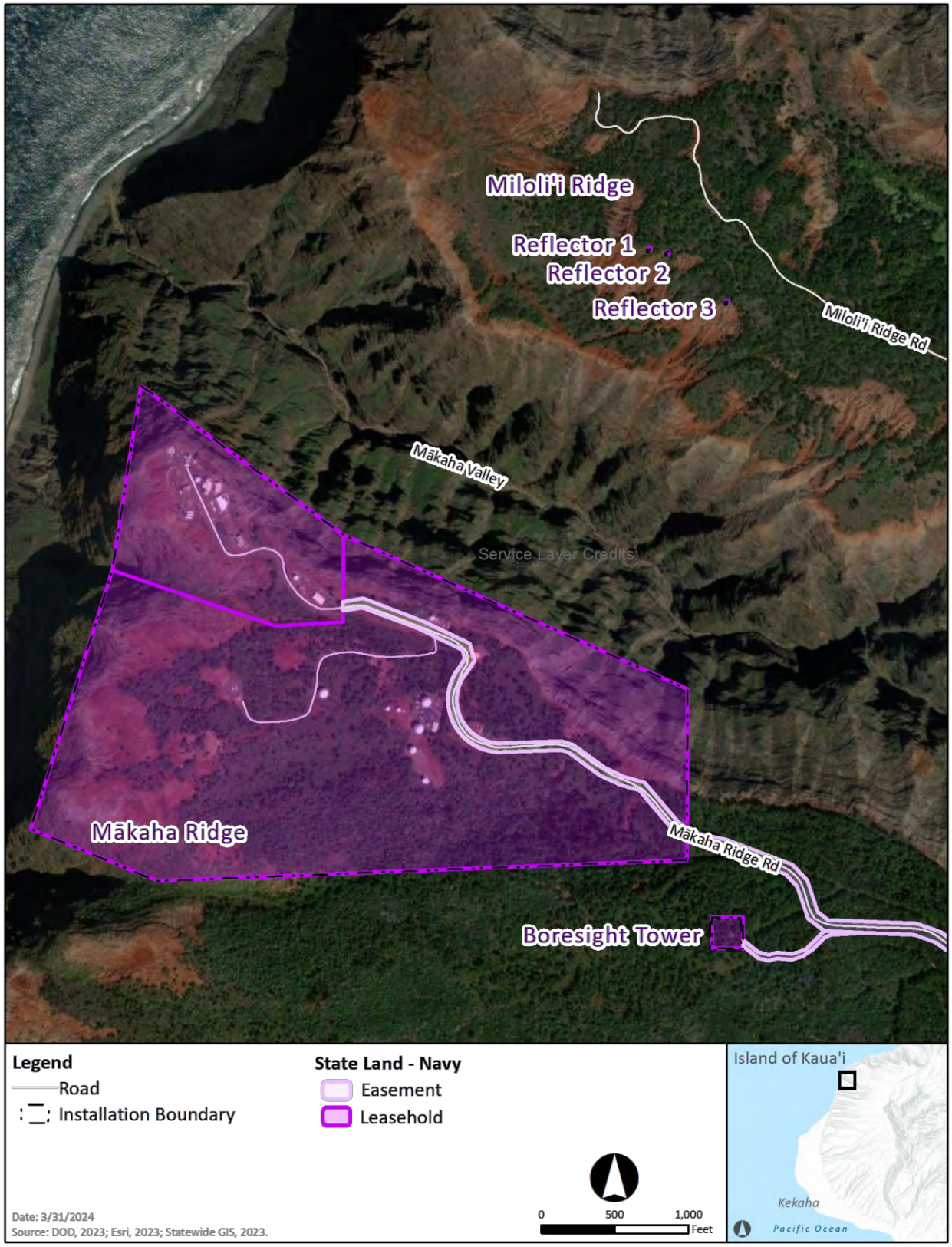

Figure 2-7 Alternative 1: Mākaha Ridge

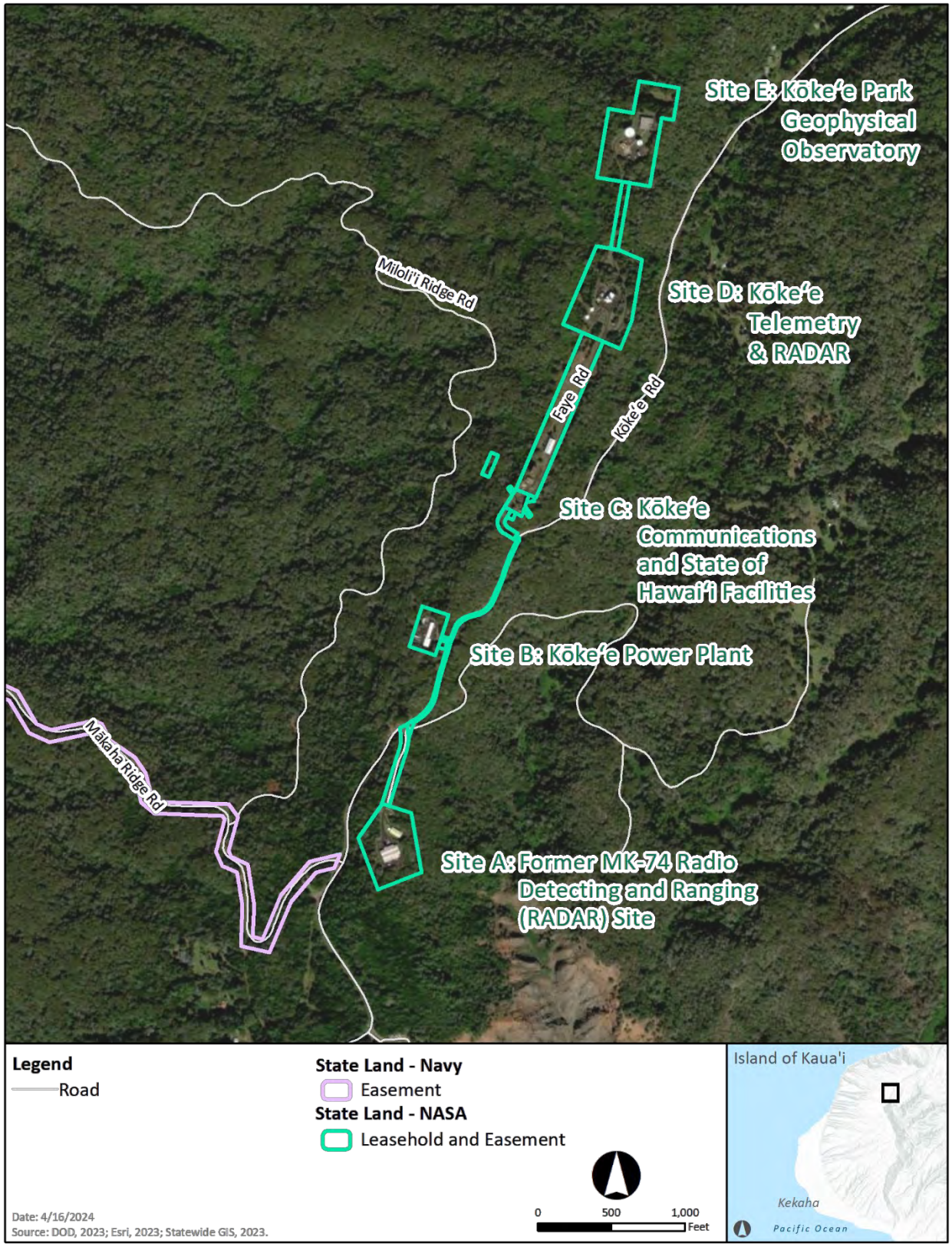

Figure 2-8 Alternative 1: KPGO

By acquiring the leased parcels, this alternative meets the purpose and need of the Proposed Action, secures the long-term Navy and NASA use of State lands near Navy lands on Kaua‘i, and preserves the long-term use of State land for military readiness and continuation of Navy activities, as well as NASA’s current geodetic activities. This alternative also meets all of the screening factors (see Section 2.2, *Alternative Screening Process*). It would result in federal ownership of land that is currently leased from the state, which would allow the Navy to maintain long-term use of DoD land on Kaua‘i, preserve current DoD operations, and retain existing DoD infrastructure. Under this alternative, the Navy and NASA would continue current management of natural and cultural resources on these lands, which are consistent with DLNR’s environmental and conservation programs.

2.3.3 Alternative 3: No Action Alternative

Under the No Action Alternative, the Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place, from Navy and NASA leased and easement lands.

Under the No Action Alternative, the Navy would not be able to conduct a substantial portion of training and testing events because of the loss of safety and buffer areas for missile and target launches and access to critical infrastructure necessary to support ongoing operations at PMRF. This includes Mānā Water Well (the primary potable water source for operations at the Main Base), support facilities at Mākaha Ridge, ordnance storage at Kamokalā Ridge, utility infrastructure and roads at the Main Base, secondary and operation access roads to the Main Base and Mākaha Ridge, frequency shift reflectors at Miloli‘i Ridge, utility and drainage easements, and the secondary access gate necessary for ensuring a safe route for ordnance transport to and from the Main Base. The Navy would not be able to calibrate instrumentation and antennas used to ensure safety on the range, resulting in a loss of support to surface, subsurface, air, and space operations. Loss of Navy radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range. The loss of ordnance storage at Kamokalā Ridge would prohibit the Navy from supporting certain missions at PMRF. The loss at KPGO would impact NASA’s ability to maintain a global network of space geodetic observatories that work together to maintain a stable terrestrial reference system contributing to NASA missions, military and civilian navigation, and the scientific community.

In addition, the environmental management and stewardship currently conducted by Navy and NASA on leased land and by the Navy on easement lands would no longer occur (see Section 1.3.6, *Environmental Management and Stewardship*).

The sections below provide details about the No Action Alternative in relation to state actions and responsibilities, as well as federal actions and responsibilities (DoD and NASA). A more detailed description of impacts by lease and easement from the No Action Alternative are included in Appendix E. The No Action Alternative does not meet the purpose and need (see Section 1.4, *Purpose of and Need for the Proposed Action*). However, the analysis associated with the No Action Alternative is carried forward as required by NEPA and HEPA for comparative purposes.

2.3.3.1 State Actions and Responsibilities

The No Action Alternative would result in the State of Hawai‘i assuming full control and management of the leased and easement lands after expiration of the leases and easements in 2027, 2029, and 2030. This would result in DLNR assuming sole responsibility, including funding, for the natural and cultural resources and public activities that are presently maintained by the Navy on the leased and easement lands.

2.3.3.2 Federal Actions and Responsibilities

Under this alternative, there would be a considerable change in how the Navy uses its fee simple property, and for NASA, its operations at KPGO would cease, severely impacting the SGP. The existing leases and easements impose certain obligations on the Navy and NASA prior to returning the property to the State. These obligations include reforestation, removal of signs, demolition and removal of existing and abandoned structures, and removal of surface weapons used in connection with DoD training activities.

2.3.3.2.1 Navy Actions and Responsibilities

PMRF Training and Testing Mission

Under the No Action Alternative, the Navy would conduct only a portion of its current mission at PMRF. Without succeeding long-term real estate agreements, most of the current training and testing could not occur, resulting in an irreplaceable loss of capabilities that would severely diminish the military value of PMRF and cause severe disruption to the DoD mission and negatively impact national security.

A summary of impacts to the Navy is provided in Table 2-4.

Table 2-4 Impacts to PMRF Training and Testing Mission from the No Action Alternative

Activities	*Impact to Mission from the No Action Alternative*
Missile/Target Launches	The loss of required setback distances and easement areas would substantially reduce essential safety buffer zones required for training and testing missions as well as for preventing incompatible development. Without these setbacks and safety buffer zones, operations at the Main Base could not continue as currently conducted. Only a limited set of aerial targets could potentially be launched without the land needed for safety buffer zones.
Encroachment Planning	The loss of required setback distances and easement areas would eliminate the ability of the Navy to maintain encroachment buffers that help prevent real estate development around the installation incompatible with the PMRF training and testing mission.
Facility Use and Management	The Navy would have no access to critical infrastructure facilities that support operations at Mākaha Ridge (including a guard shack, a Frequency Interference Control Building, Maintenance Facility, Telemetry Building, a boresight tower, telemetry antennas, water tanks, a laboratory, radar sites, communications, a power plant, antennas, and a helicopter pad), ordnance storage at Kamokalā Ridge, 22 buildings with utility infrastructure and roads at the Main Base, secondary and operation access roads to the Main Base, access roads to Mākaha Ridge, and frequency shift reflectors at Miloli‘i Ridge, as well as utility and drainage easements. This alternative would also result in the loss of the Navy’s environmental management and stewardship programs described in Section 1.3.5, *Environmental Management and Stewardship*.

Activities	*Impact to Mission from the No Action Alternative*
Flood Protection	Loss of drainage easements could impact range and daily operations until drainage management is established to prevent flooding of adjacent agricultural lands.
Support Facilities and Utilities Transmission	Buildings at the Main Base located on leased lands are strategically located and cannot be moved; therefore, the loss of these buildings and the utility easements that support them would result in losing the ability to conduct missions at PMRF associated with this infrastructure. Loss of utility easements would impact all range and daily operations unless new utility connections could be established.
Potable Water	Loss of access to the Mānā Water Well would result in severe impacts to daily operations as it is the primary source of all potable water for PMRF. Without access to a steady, reliable source of potable water, there would be effects on overall living conditions and PMRF would not have water for a myriad of operations, such as for supply chillers and fire suppression.
Instrumentation	With the loss of Mākaha Ridge, most of the training and testing operations would cease since there would be an inability to calibrate instrumentation and antennas, which would limit effectiveness during data collection and could result in safety issues related to tracking on the range. This would result in a loss of support to surface, subsurface, air, and space operations. Loss of frequency shift reflectors at Miloliʻi Ridge would result in the inability to calibrate instrumentation and antennas, which would limit effectiveness during data collection and could result in safety issues related to tracking on the range. Loss of radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range.
Ordnance Storage/ Management	With the loss of ordnance storage at Kamokalā Ridge, the base would not be able to meet explosive safety storage requirements and could not support certain missions at PMRF. Without storage, the missile assembly building could not be used since there would be no safe place to store the assembled munitions.
Access	Loss of access roads at the Main Base located on State land would result in impacts to operations, since the secondary access gate is utilized by personnel during peak commute times and is used as a primary access point when the primary access gate is closed. The loss of the ordnance gate would result in shifting of ordnance transport through the primary gate, which could result in impacts to safety and would limit access to and from the base during times when ordnance is being transported.
Power	Loss of Site B, which includes the back-up plant diesel generator for Sites A, C, D, and E, would impact the source of reliable power when systems at KPGO are supporting range operations.

Key: KPGO = Kōkeʻe Park Geophysical Observatory; PMRF = Pacific Missile Range Facility.

Navy Environmental Management and Stewardship

Under the No Action Alternative, environmental management and stewardship activities conducted by the Navy on lease and easement lands would cease. These activities include, but are not limited to, REPI projects, implementation of the PMRF INRMP and PMRF ICRMP, as well as the Agricultural Preservation Initiative.

2.3.3.2.2 NASA Actions and Responsibilities

Under the No Action Alternative, NASA would lose access to Sites A through E at KPGO. Without succeeding long-term real estate agreements, all of NASA's current activities at KPGO would cease. This would result in a loss of capabilities to the larger SGP which includes a global network of interconnected

instruments that are the foundation for Earth observations and georeferenced data used by virtually all of society. A summary of impacts to the NASA mission from this alternative is provided in Table 2-5.

Table 2-5 Impacts to NASA Activities from the No Action Alternative

NASA Activities	*Impact to NASA Activities from the No Action Alternative*
Space Geodesy Project	Without use of KPGO Sites A through E, NASA would lose its northern Pacific VLBI and DORIS stations, and two GNSS stations, substantially reducing the capability of NASA's global SGP to support the following: spacecraft tracking; as well as military and civilian terrestrial, airborne, and maritime navigation; and the scientific disciplines that rely on the data produced at KPGO.

Key: DORIS = Doppler Orbitography and Radio-positioning Integrated by Satellite; GNSS = Global Navigation Satellite System; KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; SGP = Space Geodesy Project; VLBI = Very Long Baseline Interferometry.

The loss at KPGO would impact NASA's ability to maintain a global network of space geodetic observatories that work together to maintain a stable terrestrial reference system which provides the foundation for virtually all other Earth observations and georeferenced data used by society. It is fundamental for spacecraft tracking, as well as terrestrial, airborne, and maritime navigation. The scientific disciplines that rely on these data include areas of study such as sea level changes, earthquake early warning systems, volcano deformation, flooding patterns, and glacier dynamics. This loss would impact NASA missions, military and civilian navigation, the scientific community, and society overall.

The No Action Alternative would not meet the purpose of and need for the Proposed Action; however, as required by NEPA and HEPA, this alternative is carried forward for analysis in the Draft EIS. The No Action Alternative will be used to analyze the consequences of not undertaking the Proposed Action and will serve to establish a comparative baseline for analysis.

2.4 Alternatives Considered but Not Carried Forward for Detailed Analysis

As part of the alternative identification process, agencies are required to describe the alternatives considered but eliminated from detailed analysis and to provide a brief discussion of the rationale for not studying the alternative in detail. The following alternatives were considered but not carried forward for detailed analysis because they do not meet the purpose and need for the Proposed Action.

2.4.1 Succeeding Leases and Easements Except Current Leases at Mākaha Ridge and KPGO are Not Renewed

Under this alternative, the Navy would obtain succeeding leases and easements on leased land not currently located in the State of Hawaiʻi's Conservation District, except for leases at Polihale State Park. These would include leases at the Main Base, Kamokalā Ridge, Mānā Water Well, and Miloliʻi Ridge, but would not include succeeding leases or easements at Mākaha Ridge or KPGO. Under this alternative, the Navy would not have access to the secondary missile tracking and surveillance station. Without this secondary operations area, the Navy could not conduct radar tracking, telemetry receiving/recording, frequency monitoring, or target control and would lose access to the land with the buildings and facilities located there. Without leaseholds at KPGO, NASA operations, including support of navigation systems and spacecraft tracking, would cease. This alternative does not meet screening factors (1) maintain long-term use of land currently used to support DoD and NASA missions on Kauaʻi, (2) preserve

current DoD and NASA operations on Kaua‘i, and (3) retain existing DoD and NASA infrastructure on Kaua‘i.

2.4.2 Succeeding Leases Only (Current Easements are Not Renewed)

Under this alternative, the Navy and NASA would only obtain succeeding lease agreements and not succeeding easements. These would include succeeding leases at the Main Base, Kamokalā Ridge, Mānā Water Well, Miloli‘i Ridge, Mākaha Ridge, and KPGO, but not easements at the Main Base, Kamokalā Ridge, Mākaha Ridge, and KPGO. Without succeeding easements, the Navy would lose required setback distances that provide essential safety buffer zones required for training and test missions, access roads, and utility easements. Without access to or use of the roads, the Navy would not be able to access the leaseholds located at Kamokalā Ridge, Mānā Water Well, or Mākaha Ridge. Additionally, the Navy would not be able to continue environmental management or stewardship programs. This alternative does not meet screening factors (1) maintain long-term use of land currently used to support DoD and NASA missions on Kaua‘i, (2) preserve current DoD operations, (3) retain existing DoD infrastructure, and (4) support DLNR management of public lands and associated environmental and conservation programs. Under this alternative, NASA could also not continue its mission.

2.5 Best Management Practices

BMPs are policies, practices, and measures the Navy uses to reduce the environmental impacts of designated activities, functions, or processes. Although these actions mitigate potential impacts by avoiding, minimizing, or reducing/eliminating impacts, they are distinguished from potential mitigation measures because these actions are (1) existing requirements for the Proposed Action; (2) on-going, regularly occurring practices; or (3) not unique to this Proposed Action. More specifically, these conservation measures are inherently part of the Proposed Action and are not potential mitigation measures proposed as a function of the environmental review or approval process for the Proposed Action.

Table 2-6 lists currently used PMRF and KPGO BMPs which include Standard Operating Procedures (SOPs) from the ICRMP and resource management strategies from the INRMP, as well as those established by the applicable regulations, policy, and other installation SOPs. Proposed mitigation measures to minimize the impacts of the Proposed Action will be discussed in the Draft EIS. Under the No Action Alternative, the Navy and NASA would not continue the BMPs and management strategies listed in Table 2-6 on leaseholds and easement lands.

NASA’s contractor operates KPGO (Site E) in accordance with the Environmental Management Plan under the Space Exploration Network Services and Evolution contract. Implementation of the Environmental Management Plan includes the following steps: implementation of the plan; evaluation, checking, and corrective action; environmental planning and impact process (see Table 2-6); water management; air quality management; and waste management.

Table 2-6 PMRF and KPGO Best Management Practices and Resource Management Strategies

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
PMRF – Cultural Resources Management (CRM)[1]			
CRM-1	Impacts to historic properties	ICRMP SOP # 1: NHPA Section 110 Compliance. The Navy has an ongoing management responsibility to identify, preserve, and protect the significant cultural resources at PMRF. Section 110 mandates agencies to assume responsibility for the preservation of historic properties under their jurisdiction and, to the maximum extent feasible, use historic properties available to the agency.	Ongoing and future activities.
CRM-2	Impacts to historic properties	ICRMP SOP #2: Coordination with Natural Resources Management. DoD Instructions 4715.03 and 4715.16 and Office of the Chief of Naval Operations Instruction (OPNAVINST) 5090.1E require that cultural resources management programs be integrated with natural resources programs. This coordination is meant to make certain, to the maximum extent feasible, that the Navy complies with all applicable Executive Orders and federal natural and cultural resources statutory and regulatory requirements. The PMRF CRM is responsible for the coordination of cultural and natural resources at PMRF and conducting NHPA Section 106 reviews in conjunction with NEPA reviews and Section 7 of the ESA. SOP #2 of the ICRMP describes this process at PMRF.	Ongoing and future activities.
CRM-3	Impacts to historic properties	ICRMP SOP #3: Cultural Resources Data Management. The Navy maintains an effective data management system to facilitate compliance with Sections 106 and 110 of the NHPA as well as NEPA and requirements for curating federally owned and administered archaeological collections (36 CFR Part 79). SOP #3 of the ICRMP describes the Cultural Resources Data Management program at PMRF.	Ongoing and future activities.
CRM-4	Impacts to historic properties	ICRMP SOP #4: NHPA Section 106 Compliance. Section 106 of the NHPA is a process designed to ensure that historic properties are taken into account during the planning and execution of federal undertakings. SOP #4 describes the integration of the Section 106 process of the NHPA, implemented by regulations of the ACHP (36 CFR Part 800), as well as ARPA and the provisions of the Commander, Navy Region Hawaiʻi (CNRH) PA for Navy undertakings in Hawaiʻi that is followed at PMRF.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-5	Impacts to historic properties	ICRMP SOP #5: ARPA Compliance. Per this Act, it is a federal offense to excavate, remove, damage, alter, or otherwise deface archaeological resources on federal lands without authorization. The sale, purchase, exchange, transport, or receipt of archaeological resources obtained in violation of this law also is a federal offense. SOP #5 of the ICRMP describes the enforcement of ARPA at PMRF.	Ongoing and future activities.
CRM-6	Impacts to historic properties and traditional Hawaiian cultural resources	ICRMP SOP #6: Native Hawaiian Consultation. Consultation is mandated by federal laws, including the NHPA, American Indian Religious Freedom Act, NAGPRA, and ARPA. Consultation is also mandated by the MOA among the U.S. Navy, PMRF, Hawaiʻi SHPO, and ACHP regarding activities proposed within the 1998 PMRF Enhanced Capacity Final EIS, DoD Directive 4710.03, and CNRH PA. SECNAVINST 4000.35A also specifies that appropriate consultation will be initiated with Native Hawaiians "whenever the [Navy] conducts or supports undertakings that may affect any National Register resource, whether [Navy]-managed or not." SOP #6 describes this process at PMRF.	Ongoing and future activities.
CRM-7	Cultural resource protection	ICRMP SOP #7: Management of Historic Properties. In cases in which Navy undertakings will have effects or adverse effects on cultural resources, the PMRF CRM will activate the Section 106 consultation process with the Hawaiʻi SHPO and the ACHP. If the project, however, meets The Secretary of the Interior's Standards for the Treatment of Historic Properties, including preserving, rehabilitating, restoring, and reconstructing historic buildings, the undertaking may be determined to be exempt from the full Section 106 consultation process. The PMRF CRM must consult with CNRH, the Hawaiʻi SHPO, ACHP, and Native Hawaiian organizations regarding any effects to historic properties as a result of base activities, and shall also refer to, and comply with, existing MOAs, PAs, and The Secretary of the Interior's Standards for the Treatment of Historic Properties.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-8	Cultural resource protection	ICRMP SOP # 8: Monitoring During Construction and/or Ground-Disturbing Activities. Archaeological monitoring will be conducted during construction and/or ground-disturbing activities within areas of potential effect identified as archaeologically sensitive areas. The primary responsibility for carrying out this BMP lies with on-site managers of the undertaking, professional archaeological monitors, the PMRF CRM, and the Navy Region Hawaiʻi Historic Preservation Officer. SOP #8 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work in archaeologically sensitive areas.	Ongoing and future activities.
CRM-9	Cultural resource protection	ICRMP SOP# 9: Inadvertent Discovery of Archaeological Remains. Inadvertent discovery refers to the unintentional discovery of archaeological resources during the course of operations at PMRF. On-site managers of undertakings, the PMRF CRM, and the Navy Region Hawaiʻi Historic Preservation Officer are responsible for planning for subsequent discoveries through PAs pursuant to 36 CFR Part 800, Section 800.14(b) (agency program alternatives) or other agreement documents when a survey indicates that historic properties are likely to be discovered during implementation of an undertaking. PMRF shall make reasonable efforts to avoid, minimize, or mitigate adverse effects to such properties until a mitigation plan is carried out. SOP #9 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work that could result in inadvertent discovery of remains.	Ongoing and future activities.
CRM-10	Cultural resource protection	ICRMP SOP #10: Inadvertent Discovery of Human Remains. Inadvertent discovery refers to the unintentional discovery of human remains during the course of operations at PMRF. In 2011, the Navy and Na Ohana Papa o Mana executed a NAGPRA CA to address all federal agency land management activities that could result on the intentional excavation or inadvertent discovery of NAGPRA items. The CA documents the process for carrying out the requirements of 43 CFR 10, Subpart B for standard consultation procedures, determination of custody, treatment, and disposition of NAGPRA items. SOP #10 of the ICRMP describes this process, and a copy of the SOP should be provided to all on-site managers and supervisors who are carrying out work that could result in inadvertent discovery of human remains.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-11	Cultural resource protection	ICRMP SOP #11: Curation. The Navy's cultural resources responsibilities include providing for the curation of artifact collections and historical documents recovered from agency-owned or -leased property as required under 36 CFR Part 79, 36 CFR Part 1220, and 36 CFR Part 1228, as well as SECNAVINST 4000.35A and OPNAVINST 5090.1E.	Ongoing and future activities.
CRM-12	Cultural resource protection	ICRMP SOP #12: Use of Historic Properties. In accordance with Section 110 of the NHPA and SECNAVIST 4000.35A, the Navy should use available historic buildings to the maximum extent feasible (while preserving their historic character and function) prior to new construction, lease, or the acquisition of buildings used to carry out its responsibilities as long as reuse does not conflict with the mission of the Navy. SOP #12 of the ICRMP provides uniform guidelines for PMRF staff and tenants/users when planning projects that involve demolition, removal, or replacement of a historic building or structure that is listed, or is eligible for listing, in the NRHP, or has not been evaluated for eligibility.	Ongoing and future activities.
CRM-13	Cultural resource protection	ICRMP SOP #13: Historic Asset Management Process. The HAMP is a project planning tool that provides access to information and a standard method to support compliance with the NHPA and NEPA. Once a proponent identifies project requirements, the HAMP tools guide the proponent through steps to identify project alternatives that will have the least effect on built-environment historic properties, including reuse/rehabilitation, new construction, or demolition footprint reduction.	Ongoing and future activities.
CRM-14	Cultural resource protection	ICRMP SOP #14: Emergency Situations. Provides guidelines in the event of (1) emergencies involving imminent threat to national security, to life or property, or a declaration of a natural disaster, and (2) damage to sites from natural actions such as erosion.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
CRM-15	Cultural resource protection	ICRMP SOP #15: Public Involvement and Outreach. The PMRF CRM routinely coordinates with CNRH and the Hawai‘i SHPO on cultural resources management issues. Additionally, DoD Instruction 4715.16 states, “all installations with cultural resources will have a public outreach program.” PMRF has an active and robust public outreach program, ranging from educational programs to facilitating public access to culturally important sites. Outreach visitors and participants have included, and will continue to include, local residents and Hawaiian descendants, plantation, and military community members; Native Hawaiian organizations; congressional delegations; officials from DoD and the Missile Defense Agency, as well as state and county officials; and local school groups and a myriad of nongovernmental organizations.	Ongoing and future activities.
CRM-16	Cultural resource protection	ICRMP SOP #16: Public and Cultural Access. SOP #16 provides guidelines and procedures for responding to requests for public access and for cultural access to individuals and organizations, including any Native Hawaiian organization that attaches cultural significance to historic properties on PMRF.	Ongoing and future activities.
CRM-17	Cultural resource protection	ICRMP SOP #17: Permits, Leases, and Contracts. SOP #17 provides standardized ARPA statements for inclusion in permits, leases, contracts, or other legal agreements between CNRH and other military branches, government agencies, individuals, businesses, or organizations. It is based on ARPA and OPNAVINST 5090.1E. The primary responsibility for implementing this SOP lies with real estate, contracting, and legal staff preparing permits, leases, contracts, or other legal agreements	The Proposed Action and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
PMRF – Natural Resources[2]			
Soil management	Impacts to soils	• Conduct general monitoring for coastal dune habitat and soil compaction issues annually to prevent and minimize the potential for soil degradation. • Mitigate and prevent soil erosion of coastal dune habitat by outplanting, establishing, and monitoring native dune building plants in areas identified as having erosion issues. • Implement additional security measures such as increased signage and roping off specific areas to alleviate undue pressures from off-road vehicle presence, especially in Nohili Dune areas. • Maintain Mākaha Ridge ungulate exclusion fencing for erosion control. • Outplant native, drought tolerant plants in areas identified as having erosion and soil compaction issues. Ensure that a regular monitoring schedule and a sufficient irrigation system are in place until plants are well established.	Ongoing and future activities.
Designated critical habitat	Impacts to designated critical habitat for panicgrass	• Work to improve protection, habitat, and/or consider outplanting Niʻihau panicgrass. • Protections will be aimed at preventing unauthorized off-road vehicle use, and invasive plant removal and to demonstrate benefit to the species. • Outplant native species and remove invasive species in areas with suitable Niʻihau panicgrass habitat and ensure an irrigation system is in place until plants become well established. • Consider undergoing the approval process to outplant the endangered *Panicum niihauense* in the effort to remove or reduce amount of PMRF property designated as critical habitat for the species. Coordinate with federal and state partners to secure material for outplanting if pursued.	Ongoing and future activities. Construction.
Hawaiian picture-wing fly management	Impacts to Hawaiian picture-wing flies	• Conduct surveys every 5 years to assess presence/absence of endangered Hawaiian picture-wing fly species at and directly adjacent to KPGO. • Conduct invasive plant removals annually in areas near known Hawaiian picture-wing fly habitat to promote native tree health and propagation and reduce introductions of invasive species into adjacent habitat due to Navy operations.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Marine nearshore management	Impacts to nearshore environments	• Establish a monitoring program for the nearshore environment of PMRF to inform future management decisions and monitor changes over time. • Partner with DLNR Division of Aquatic Resources (DAR) to incorporate regular monitoring site(s) in PMRF's nearshore waters into the state's regular monitoring schedule, as feasible.	Ongoing and future activities.
Monk seal management	Impacts to Hawaiian monk seals	• Continue to ensure that Security reports sightings of monk seals during daily patrols at PMRF beaches and erects signage and barricades if observed where people frequent. • Continue to report observations of hauled-out Hawaiian Monk Seals to NOAA as soon as possible and provide high-quality photos to assess seal health, identification, and aid in population abundance monitoring. • Conduct regular surveys approximately 5 times per week on beaches near the Nohili Ditch outfall and Diver's Landing for monk seal presence, and all other beaches approximately twice per week. • Continue to conduct surveys through partnership with NOAA Fisheries for Hawaiian Monk Seals on Niʻihau.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Sea turtle management	Impacts to sea turtles	• Continue to partner with Security in ensuring daily patrols of PMRF's beaches for sea turtles to collect observational data and check for stranded, injured, or entangled turtles. • Conduct surveys by biologists approximately 5 times per week on beaches near the Nohili Ditch outfall and Diver's Landing for sea turtle presence and ensure that marine surveys in nearshore areas quantify sea turtles and potential foraging or resting habitat. • Continue to survey beaches for sea turtle nesting activity during the nesting season, protect all nests observed with ropes and signage, mitigate light attraction issues on beaches, and coordinate with DAR to excavate nests. • Continue to encourage good communication between Security and natural resources staff regarding sea turtle activity on PMRF beaches to reduce negative impacts to the species from Security beach patrol vehicles. • Develop and use USFWS-approved outreach, educational materials, and signage with the objective to educate and provide information to residents, recreational users, visitors, and staff about proper procedures and acceptable activities within sea turtle habitat and how to act when coming in contact with sea turtles.	Ongoing and future operations.
Marine mammal management	Impacts to marine mammals	• Continue to report all observations of marine mammal strandings or deaths to NMFS and assist in response efforts. • Range users continue to adhere to protective measures for all training and testing per requirements under *Hawaii-Southern California Training and Testing Final EIS/OEIS* authorizations.	Ongoing and future operations.
Ungulate management	Impacts to natural resources habitats ESA terrestrial species	• Maintain efficacy of ungulate-proof fence at Mākaha Ridge. • Conduct regular monitoring for ungulates inside the fence, as well as vulnerable areas along the fence. • Maintain Mākaha Ridge fence for erosion control.	Ongoing and future operations.
Predator management	Impacts to MBTA species and Laysan albatross	• Continue base-wide predator control to protect MBTA-listed species including Laysan albatross; monitor for pigs, dogs, and cats in known breeding areas prior to the albatross breeding season and increase control efforts as needed.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Predator management	Impacts to monk seals	• Continue base-wide predator control to remove feral cats and collaborate with partners on studies regarding toxoplasmosis at PMRF to inform these efforts; conduct outreach about the disease and its effects on wildlife and human health.	Ongoing and future operations.
Predator management	Impacts to natural resources	• Work with the PMRF Archery Club to control ungulate populations at the Kamokalā Ridge site by implementing trapping and baiting stations if the animals become a nuisance to Navy operations or pose a risk to protected species. • Conduct observations to identify feral cats at Kamokalā Ridge and consider expanding cat trapping if use is consistent or becomes a nuisance.	Ongoing and future operations.
Wildland fire management	Impacts to natural resources	• Remove deadfall (woody debris) in high-risk areas including near the Barking Sands missile launch site and the Kamokalā Ridge Magazines and replant with native, low fire risk species.	Ongoing and future operations.
Wildland fire management	Impacts to natural and cultural resources	• Coordinate with the PMRF Fire Department on developing updates to the existing Fire Management Plan.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• Coordinate with USFWS, DOFAW, PMRF Air Ops, and PMRF Public Works to annually review and update the PMRF Nēnē Management Plan. • Work with PMRF Air Ops and USDA-WS to insure nēnē hazing efforts are increased prior to and during the breeding season with the possibility of including weekends, especially if a nēnē pair has been regularly observed on or near the airfield. • Collaborate with DOFAW to have all nēnē that hatch at PMRF banded and pursue permission and permits for PMRF natural resources staff to band birds if allowable.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• Continue to conduct regular, standardized surveys for nēnē at PMRF Barking Sands, Mākaha Ridge, and KPGO sites to effectively detect nēnē nests and inform management and determine habitat types that attract the species.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Nēnē management	Impacts to nēnē	• Continue to communicate with facilities maintenance personnel about nēnē nest locations and collaborate to develop effective protective measures for the species and ensure that no vegetation removal or other persistent disturbances occur within 100 feet of nest sites and goslings to reduce risk of take. • Support regular outreach to PMRF visitors and personnel on the importance of not providing food and water to nēnē and develop outreach material aimed at increasing awareness of the species.	Ongoing and future operations.
Nēnē management	Impacts to nēnē	• For all new construction at Barking Sands, including construction for tenant or customer DoD commands or other federal agencies, concrete, asphalt, gravel, xeriscaping, or native vegetation that does not act as a nēnē attractant, rather than lawn, will be installed in open areas surrounding buildings and parking areas to decrease attraction of nēnē.	Construction.
Waterbird risk management	Impacts to waterbirds, public health, and safety	• Continue to coordinate closely with Facilities Maintenance regarding restrictions on vegetation removal practices within a 100-foot radius of waterbirds or their nests. • Discourage waterbird presence and nesting at the oxidation pond complex by maintaining vegetation at a height of less than 6 inches and by funding the installation of exclusionary measures. • Continue to coordinate with Facilities Maintenance to obtain environmental data on the oxidation pond regularly to better inform causes of avian botulism outbreaks and identify high-risk conditions that require management actions. • Coordinate with Public Works to develop oxidation pond flushing protocols in response to avian botulism outbreaks or high-risk conditions. • Coordinate with Facilities Maintenance on all oxidation pond complex construction and restoration plans. • Supplement ongoing water quality testing to detect particulates and soluble chemicals in waters at PMRF. Testing should be conducted at least quarterly.	Ongoing and future operations.
Waterbird risk management	Impacts to waterbirds	• Replace and improve waterbird crossing signage at PMRF as needed to reduce risk of vehicle strikes, evaluate efficacy of signs, and explore new tools to reduce vehicle strikes.	Ongoing and future activities.
Waterbird Risk management	Impacts to waterbirds	• Continue to conduct regular monitoring for Hawaiian waterbird species at Barking Sands to effectively detect and reduce impacts to nests.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
MBTA management	Impacts to MBTA species	• Continue to incorporate monitoring of shorebirds, cattle egrets (*Bubulcus ibis*), and black-crowned night herons (*Nycticorax nycticorax*) at wetland sites. Record opportunistic observations of barn owls (*Tyto alba*) and pueo (*Asio flammeus sandwichensis*) at all other areas of base to inform control measures for non-native species and protective measures for native species. • Keep track of non-native songbird species at PMRF and their numbers by participating in the annual Audubon Christmas Bird Count.	Ongoing and future activities.
MBTA management	Impacts to MBTA species	• Continue to advise development projects at PMRF that have potential to negatively impact native MBTA species and their habitat on how to avoid impacts. • Advise development projects at PMRF on how to avoid creating habitat and foraging availability for non-native MBTA species at PMRF especially near the PMRF airfield.	Ongoing and future activities.
Laysan albatross management	Impacts to Laysan albatross	• Coordinate with DOFAW on potential new albatross release sites. • Work with partners to ensure that as many albatross eggs as possible stay on Kaua‘i and find new suitable egg relocation locations. • Closely monitor re-sights of translocated albatross by working with partners on the north shore of Kaua‘i to enter data into the Airtable application database.	Ongoing and future activities.
Laysan albatross management	Impacts to Laysan albatross	• Continue the PMRF Laysan Albatross Egg Swap program. • Continue to translocate albatross to the north shore of Kaua‘i from January–April. • Support research on PMRF albatross populations that increases the understanding of their behavior as it relates to the PMRF airfield.	Ongoing and future activities.
Shearwater management	Impacts to shearwater nesting	• Enhance wedge-tailed shearwater (*Ardenna pacifica*) habitat in areas far from the PMRF airfield and human presence and develop deterrent measures for burrows in areas of human traffic and near the airfield. • Research and work with facilities and Morale, Welfare, and Recreation to implement methods for discouraging wedge-tailed shearwater burrowing in the immediate vicinity of the PMRF Beach Cottages. • Continue to implement protective measures that prevent the crushing of burrows in the beach cottages area (e.g., signage, temporary rope fencing, wooden burrow tents, outreach materials in cottages).	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Shearwater management	Impacts to shearwater populations	• Conduct annual wedge-tailed shearwater population surveys in the Kinikini Ditch, beach cottages, and Nohili Dune areas. • Work with partners to collect additional data that supports adaptive management on PMRF and regional conservation objectives for shearwater species.	Ongoing and future activities.
Bat management	Impacts to Hawaiian hoary bat (pupping season)	• Tree trimming/removal activities shall be conducted outside of the bat pupping season of June 1 to September 15 to the maximum extent practicable to avoid and minimize effects of base infrastructure, operations, and maintenance. • Conduct follow-up acoustic surveys for Hawaiian hoary bats every 5 years. • In situations where trimming or removal of a tree with a known bat roost is determined necessary, the Navy shall work with the USFWS to develop and implement an SOP for bat roosting surveys.	Ongoing and future activities. Construction.
Invasive plant species management	Impacts to natural resources	• Native vegetation shall be used as practicable, and recommended by agencies, for revegetation efforts. • Ensure species identified as invasive in Hawaiʻi are not utilized for outplanting, landscaping, or erosion control efforts. Develop a Landscaping Guide to include in all base contracts and integrate into the installation appearance plan.	Ongoing and future activities.
Invasive plant species management	Impacts to natural resources	• Ensure early detection and a rapid response to invasive plant species in sensitive areas. Conduct removal of invasive plant species in sensitive areas, monitor for re-growth, and restore with outplantings, if necessary, with a target of 80% reduction in invasive species within the areas of concern.	Ongoing and future activities.
Invasive animal species management	Impacts to natural resources	• Include biosecurity requirements and provisions in Base Operating Support (BOS) and construction contracts to ensure invasive ants, frogs, and other non-native wildlife are not introduced via equipment or landscaping efforts.	Ongoing and future activities. Construction.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Invasive animal species management	Impacts to natural resources	• Increase outreach to base personnel on reporting and early detection for invasive species not yet established at PMRF. Ensure all observations or reports of high-risk invasive species are communicated to KISC and to all other appropriate agencies. • Increase outreach with all personnel on PMRF about the hazards of feeding feral/invasive species and assist in the enforcement of such policies by practicing good communication with Security.	Ongoing and future activities.
Invasive animal species management	Impacts to natural resources	• Conduct surveys to improve baseline knowledge of populations of invasive animals at PMRF. • Conduct ant surveys to assess presence of invasive ants including the little fire ants (*Wasmannia auropunctata*) at the Nohili Dune's wedge-tailed shearwater colony. If little fire ants are detected, report to KISC and implement active control by using granular bait after fledglings have left the area. • Continue to partner with the Hawai'i Department of Agriculture to ensure Coconut Rhinoceros Beetle (*Oryctes rhinoceros*) traps are checked and maintained at PMRF.	Ongoing and future activities.
Endangered seabird management	Impacts from night lighting (disorientation/ fallout)	• Whenever feasible, exterior night lighting shall include bat- and bird-friendly design features such as shielded lights (to reduce ambient light), use of motion detectors and/or other automatic controls, and lighting design that uses shields to prevent light from shining upward into the sky.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Endangered seabird management	Impacts from exterior facility lighting	• Exterior lighting shall be architecturally integrated with the character of all structures, energy efficient, and shielded or recessed so that direct glare and reflections shall be confined, to the maximum extent feasible, within the boundaries of the site. Shielded lighting directs rays toward the ground, and the light source, whether bulb or tube, shall not be visible from adjacent properties. • Exterior lighting shall be directed downward and away from adjacent properties. • Parking and security lighting shall consist of full-cutoff fixtures, which permit no upward light, unless a different cutoff classification is specifically authorized through the architectural review process. • Obtrusive light shall be minimized by limiting outdoor lighting that is misdirected, excessive, or unnecessary, and light required for the development shall be directed downward to minimize spill over onto adjacent properties and reduce vertical glare or up-lighting.	Ongoing and future activities.
Native plant habitat management	Impacts to native plant communities	• Continue to update baseline floral surveys to improve understanding of plant communities at PMRF. • Ensure post-planting care, including irrigation, invasive plant removal, and long-term monitoring and maintenance is implemented for all native plant restoration projects.	Ongoing and future activities.
Native plant habitat management	Impacts to pollinators	• Identify suitable locations for planting native Hawaiian plants, particularly those that benefit native pollinators in support of national pollinator objectives. • Ensure that plant communities found to support native terrestrial invertebrate species are protected, enhanced, and that construction or removal projects have minimal effects on these populations.	Ongoing and future activities. Construction.
Terrestrial invertebrate management	Impacts to pollinators	• Conduct species inventory at additional PMRF sites and conduct monitoring for native invertebrate species.	Ongoing and future activities.
Terrestrial invertebrate management	Impacts to pollinators	• Coordinate all use of pesticides by natural resources staff with the NAVFAC PAC Pest Management Consultant (PMC) and ensure that all applicators have received appropriate certifications. • Ensure that treatments will not have negative effects on protected species. Prohibit the use of neonicotinoids at PMRF sites.	Ongoing and future activities.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
Endangered seabird management	Impacts to seabirds	• Continue to host a Save Our Shearwaters (SOS) aid station at PMRF and monitor station during business days with SOS monitoring on weekends and holidays. • Advise various tenants on PMRF on appropriate safety lighting that is less attractive to endangered seabirds (i.e., motion sensing lights that go off after a set time period, shielded lights, facing light away from the coast, lower lumen, and lower to the ground). • Provide a 10-year calendar to mission planners with high-risk dates for endangered seabird fall out.	Ongoing and future activities.
Endangered seabird management	Impacts to seabirds	• Continue to fund and implement surveys to assess seabird strikes at KPGO Site C. • Minimize the potential for death or injury of seabirds due to collisions with PMRF communication towers located at KPGO Site C.	Ongoing and future activities.
Endangered sea bird management	Impacts to seabirds from night lighting (disorientation/fallout)	• Continue to promote base-wide awareness and implementation of the PMRF Dark Skies Program through annual trainings. • Continue Dark Skies implementation in areas adjacent to colonial nesting grounds at high elevation nesting sites during critical fledging timeframes. • Conduct systematic ground searches for fallen out seabirds after high-risk night operations.	Ongoing and future activities.
Public health and safety management	Impacts to public health and safety	• Continue to restrict access during missile testing and launches at the restricted easement adjacent to Barking Sands. • Adhere to applicable regulations and policy to limit interaction with vessel traffic when range activities occur.	Ongoing and future operations.
Public health and safety management	Impacts to public health and safety	• PMRF will coordinate with the Agribusiness Development Corporation to ensure compliance with the Clean Water Act and other environmental regulatory requirements where there is a nexus with federal monies or property.	Ongoing and future operations.

Best Management Practice	*Impacts Reduced/Avoided*	*Description of Best Management Practices and Management Strategies*	*Applicability*
KPGO – Environmental Management Plan[3]			
Endangered Species	Impacts to endangered and threatened species	• Space Exploration Network Services and Evolution (SENSE) has surveyed the endangered and threatened species around the area. Any changes to SENSE operations or construction activities are planned with the consideration of endangered and threatened species impacts to minimize or eliminate the effects on wildlife. SENSE leverages local agencies for guidance on current regulatory requirements and reduction of impacts.	Ongoing and future operations.

Key: ACHP = Advisory Council on Historic Preservation; ARPA = Archaeological Resources Protection Act; BMP = Best Management Practice; BOS = Base Operating Support; CA = Comprehensive Agreement; CFR = Code of Federal Regulations; CNRH = Commander, Navy Region Hawaii; COMPACFLT = Commander, U.S. Pacific Fleet; CRM = Cultural Resources Management; DAR = Division of Aquatic Resources; DoD = Department of Defense; DOFAW = Division of Forestry and Wildlife; DOI = Department of the Interior; EIS = Environmental Impact Statement; ESA = Endangered Species Act; HAMP = Historic Asset Management Process; ICRMP = Integrated Cultural Resources Management Plan; KISC = Kaua'i Invasive Species Committee; MBTA = Migratory Bird Treaty Act; MOA = Memorandum of Agreement; NAGPRA = Native American Graves Protection and Repatriation Act; NAVFAC PAC = Naval Facilities Engineering Systems Command Pacific; NEPA = National Environmental Policy Act; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NRHP = National Register of Historic Places; OPNAVINST = Office of the Chief of Naval Operations Instruction; PA = Programmatic Agreement; PMC = Pest Management Consultant; PMRF = Pacific Missile Range Facility; SECNAVINST = Secretary of the Navy Instruction; SENSE = Space Exploration Network Services and Evolution; SHPO = State Historic Preservation Office; SOH = Safety and Occupational Health; SOP = Standard Operating Procedure; SOS = Save our Shearwaters; USDA-WS = United States Department of Agriculture-Wildlife Services; USFWS = United States Fish and Wildlife Service.

Sources: [1]NAVFAC Pacific, 2012.
[2]NAVFAC Pacific, 2023.
[3]Space Exploration Network Services and Evolution, 2023.

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3 Project Setting

This chapter provides a preliminary overview of the project setting, or existing environmental conditions, for the resources within the State land (leaseholds and easement lands) at PMRF and KPGO. The Draft EIS will include further details on the existing conditions and potential effects of the Proposed Action and alternatives, as well as measures to minimize or mitigate these potential environmental effects.

The EISPN provides a preliminary overview of existing conditions relevant to the analysis of the Proposed Action and alternatives. The following 13 resources will be analyzed in the Draft EIS: archaeological and historic resources, cultural practices, biological resources, land use, socioeconomics, environmental justice, water resources, utilities, public health and safety, air quality and greenhouse gases, transportation, hazardous materials and wastes, and visual resources.

3.1 Archaeological and Historic Resources

The term "historic resource" as used in both NEPA and HEPA applies broadly to a variety of resources such as historic buildings, historic districts, archaeological sites, traditional places, and traditional ways of life. Several federal laws and regulations address cultural resources, including the NHPA and the Archaeological Resources Protection Act (ARPA), as well as agency-specific instructions and policies. The NHPA defines a historic property as any "prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on, the National Register of Historic Places (NRHP), including artifacts, records, and material remains related to such a property or resource." Hawaiʻi State law also regulates historic properties in HRS Chapter 6E. Under HRS Chapter 6E, historic properties include any building, structure, object, district, area, or site, including heiau (a Hawaiian sacred temple) and underwater site, which is over 50 years old; and burial sites, defined as any specific unmarked location where prehistoric or historic human skeletal remains and their associated burial goods are interred, and its immediate surrounding archaeological context. Through the HRS Chapter 6E-42 review process, historic properties are assessed for "significance" as defined in HAR § 13-284-2 before project effects are analyzed.

Under the NHPA, the affected environment for historic properties is called the Area of Potential Effects (APE). The APE is defined in 36 CFR § 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." Under HRS Chapter 6E, the affected environment for cultural resources is referred to as a "Project Area," which is defined in HAR § 13-284-2 as "the area the proposed project may potentially affect, either directly or indirectly" and includes "not only the area where the proposed project will take place, but also the proposed project's area of potential effect."

The NEPA/HEPA impact analysis will be conducted within the NHPA APE and the HRS-6E Project Area to determine potential impacts on historic resources. These areas are the same and comprise the leaseholds and easement lands at the Main Base, Kamokalā Ridge, Mānā Well, Miloliʻi Ridge, Mākaha Ridge, and KPGO. The APE for the Proposed Action is depicted as the State lands shown in Figure 1-2.

The Draft EIS will characterize the affected environment for cultural resources for Navy and NASA leasehold and easement lands. The document will identify cultural resources and assess the impacts resulting from implementation of the Proposed Action and alternatives to those cultural resources. Surveys are currently being conducted to identify cultural resources. These resources will be evaluated

for NHPA eligibility and HRS Chapter 6E significance. Both the Navy and NASA are responsible for managing historic properties under their control. PMRF's NHPA responsibilities are governed by the Commander, Navy Region (COMNAVREG) Hawaiʻi Programmatic Agreement (PA) with the SHPO and the Advisory Council on Historic Preservation (ACHP) (NAVFAC Pacific, 2012). Analysis of potential impacts to cultural resources will be conducted in accordance with the PA. The Draft EIS will evaluate potential impacts to archaeological and historic resources from implementation of the Proposed Action and alternatives.

3.2 Cultural Practices

The State of Hawaiʻi has an affirmative obligation to preserve and protect Native Hawaiians' customary and traditional rights to the extent feasible under the Hawaiʻi State Constitution, Article XII, Section 7.

Hawaii Session Law H.B. No. 2895, known as "Act 50", provides that "there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaiʻi's culture, and traditional and customary rights" (H.B. No. 2895). Act 50 requires state agencies and other developers to assess the effects of proposed land use or shoreline developments on the "cultural practices of the community and State" as part of the HEPA environmental review process. In *Ka Paʻakai O Ka ʻĀina v. Land Use Commission*, 94 Hawaiʻi 31, 7 P.3d 1068 (2000), the Hawaiʻi Supreme Court provided government agencies an analytical framework to ensure the protection and preservation of traditional and customary Native Hawaiian rights while reasonably accommodating competing interests. HEPA requires including natural or human-made resources of historic, cultural, archaeological, or aesthetic significance in this assessment.

Traditional land uses near the Project Area include habitation, subsistence activities, burial, and travel. It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain. Small fishing communities, possibly limited to temporary camps, were scattered along the coast. The people of Mānā were noted fishermen, taking advantage of the rich waters of the channel between Kauaʻi and Niʻihau. Fishing was not confined to the ocean and shoreline of Mānā, but also included the swamps and ponds on the coastal plain, where wild resources could be obtained alongside those raised through aquaculture. The coastal plain was a source of natural resources that were collected and used for a variety of purposes, including ʻaʻaliʻi shrubs for firewood, hiʻaloa and other plants for medicine, and makaloa and neki for weaving. The coastal dunes of the Mānā Plain were the burial grounds of ancient Hawaiians. Past and present cultural practices have been identified through prior consultation with Native Hawaiian Organizations and other stakeholders.

A Cultural Impact Assessment (CIA) will be prepared for the Proposed Action consistent with HEPA and Act 50 (Session Laws of Hawaiʻi, H.B. No. 2895), and will follow the State of Hawaiʻi's 1997 *Guidelines for Assessing Cultural Impacts*. The CIA will collect information relating to the practices and beliefs of Native Hawaiians who have knowledge of the Project Area. The area evaluated for the proposed CIA will be larger than the area associated with implementation of the Proposed Action to account for cultural practices that may be affected but are not included within the boundaries of the Project Area. Consequently, a large portion of the Mānā Plain inland from the Main Base will be included in the CIA. The information used in the CIA will be obtained through ethnographic and oral history interviews with knowledgeable organizations and persons such as traditional cultural practitioners, and through archival research that will include Hawaiian language sources. The assessment will consider cultural practices

and beliefs related to subsistence (e.g., fishing, gathering, and agriculture), habitation, commercial activities, access issues, recreation, religious/spiritual activities, and customs. Previously documented traditional cultural and other historic properties that are essential to these cultural practices and beliefs will be included in the analysis. The analysis conducted in the CIA will be incorporated into the Draft EIS.

3.3 Biological Resources

The Draft EIS will include a description of the biological resources in the Project Area. It will also include a discussion of known occurrences and potential habitat for species that are federally listed as endangered or threatened, habitats with substantial populations of native plants or animals, and designated critical habitats. Currently flora and fauna surveys, as well as wetland delineations, are being conducted in the area of interest.

Undeveloped leased lands at the Main Base comprise scrubland vegetation, sparse wetlands, and rolling sand dunes; easement areas include agricultural plains containing an interconnected system of irrigation ditches (Figure 3.3-1). Elevations at the Main Base range from sea level to 60 feet above sea level. Agricultural fields in the Project Area consist of both fallow and active landscapes with predominantly non-native vegetative scrub in and around the fields. Isolated wetland features support ESA-listed waterbirds, including the Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian gallinule (*Gallinula galeata sandvicensis*), Hawaiian stilt (*Himantopus mexicanus knudseni*), and Hawaiian goose or nēnē (*Branta sandvicensis*). ESA-listed plant species, including lauʻehu (*Panicum niihauense*) and ʻakoko (*Euphorbia celastroides*), occur within coastal vegetation communities. The state-recognized endemic Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) has been observed; however, it is only state-listed as endangered on Oʻahu. The endangered Hawaiian monk seal (*Neomonachus schauinslandi*), threatened green sea turtle (*Chelonia mydas*), and endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) have been observed in the coastal regions of the Main Base. Hawaiian stilts and Hawaiian yellow-faced bees (*Hylaeus* sp.) have also been observed in coastal areas adjacent to the Main Base.

Kamokalā Ridge is above adjacent agricultural lands with limited features that could provide ESA-listed flora or fauna habitat. Elevations at Kamokalā Ridge range from 240 to 320 feet above sea level. Vegetation, though sparse and lacking diversity, is consistent throughout steep cliff areas. Non-native and native trees provide canopy, while non-native scrub provides sparse understory amongst rocky terrain. The Hawaiian hoary bat, the state's only terrestrial ESA-listed mammal, has been observed in the Kamokalā Ridge area.

Mānā Well, located southeast of Kamokalā Ridge, is a small area containing an underground aquifer that provides potable water to the Main Base at an elevation of 120 feet above sea level. Mānā Well is in proximity to unmanaged lands with no known restoration efforts at the location, potential habitat for protected species is minimal.

The reflectors on Miloliʻi Ridge are situated amongst mixed coastal cliff vegetation, containing sparse native species at elevations from 1,760 to 1,790 feet above sea level. Much of the canopy comprises non-native trees with a mixed understory consisting of native and non-native shrubs and grasses.

Figure 3.3-1 Vegetation Types

Mākaha Ridge, with its diverse topography, varies in landscape and vegetation. Elevations at Mākaha Ridge range from 1,400 to 1,850 feet above sea level. Its features include eroded ridges with ruderal vegetation, as well as non-native canopies with dense understory patches. The following five federally listed plants have been documented within the coastal cliff plant communities at Mākaha Ridge: Niʻihau lobelia (*Lobelia niihauensis*), makou (*Peucedanum sandwicense*), Hawaiʻi scaleseed (*Spermolepis hawaiiensis*), dwarf iliau (*Wilkesia hobdyi*), and māʻoliʻoli (*Schiedea apokremnos*). The Hawaiian hoary bat and nēnē are ESA-listed species that have been observed in the region, as well as the state-listed pueo. ESA-listed seabirds including Newell's shearwater (*Puffinus auricularis newelli*), Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*), and the band-rumped storm petrel (*Oceanodroma castro*) have the potential to fly over Mākaha Ridge or utilize the area.

KPGO consists of maintained landscaped grass, planted fruit trees, and non-native shrubs surrounding isolated building structures located along Kaunuohua Ridge, 3,700 feet above sea level. Mixed vegetation is sparse and consists of native and non-native plant communities. The Hawaiian hoary bat, nēnē, Hawaiian petrel, Newell's shearwater, band-rumped storm petrel, Hawaiian picture-wing fly (*Drosophila musaphilia* and *Drosophila sharpi*), and ʻakoko are ESA-listed species present in the montane mesic forest region dominated by native trees. Rare state-recognized endemic forest birds such as scarlet honeycreeper or ʻiʻiwi (*Vestiaria coccinea* syn. *Drepanis coccinea*), ʻapapane (*Himatione sanguinea*), and ʻamakihi (*Chlorodrepanis stejnegeri*) have been observed in the region. Critical habitat for bluegrass (*Poa mannii*), ʻakoko (*Euphorbia halemanui*), ʻaiakeakua (*Solanum sandwicense*), *Xylosma crenatum*, *Dubautia latifolia*, ʻaiea (*Nothocestrum peltatum*), and Hawaiian picture-wing fly (*D. musaphilia*), occur outside of KPGO, along the western region of Kaunuohua Ridge.

The Draft EIS will evaluate potential impacts to biological resources from implementation of the Proposed Action and alternatives.

3.4 Land Use

The State of Hawaiʻi has a unique system of classifying and managing lands in which both state and county agencies hold distinct responsibilities. The State Land Use Law (HRS § 205) classifies all lands in Hawaiʻi into one of four State Land Use Districts (SLUDs): urban, rural, agricultural, and conservation. The land that is leased and in easement by the Navy and NASA is classified as a conservation or agricultural district. The conservation district is further divided into five subzones: limited, resource, general, protected, and special. Navy and NASA leased and easement lands lie within the following conservation subdistricts: limited, resource, and general. In addition, each county has its own classification system of zoning districts that complement the SLUD designations. The County of Kauaʻi Zoning for the Project Area includes agriculture, conservation, open space, and special treatment – ecological. Table 3.4-1 summarizes SLUD and zoning designations in the Project Area.

Table 3.4-1 State Land Use Districts and Zoning Designations in and Surrounding the Project Area

Geographical Area	*Tax Map Key Parcel*[1]	*County of Kaua'i Zoning*	*State Land Use Districts*	*Conservation Subzone*	*Owner*
Main Base	1-2-002:001, 011, 012, 013, 015, 024, 025, 026, 030; 1-2-016:011	Agriculture, Open Space, Conservation, Special Treatment–-Ecological	Agriculture, Conservation	Limited, General Subzone	State of Hawai'i, U.S. Government
Kamokalā Ridge	1-2-002:001, 027, 029	Agriculture, Open Space	Agriculture	None	State of Hawai'i
Mānā Well	1-2-002:028	Open Space	Agriculture	None	State of Hawai'i
Miloli'i Ridge	1-2-001:006	Conservation	Conservation	Resource Subzone	State of Hawai'i
Mākaha Ridge	1-2-001:001, 006, 010; 1-4-001:002, 013, 014, 999	Conservation	Conservation	Resource Subzone	State of Hawai'i
KPGO	1-4-001:013	Conservation	Conservation	Resource Subzone	State of Hawai'i

Note: [1]Some Tax Map Key Parcels may be only portions or included for more than one geographical area.
Legend: KPGO = Kōke'e Park Geophysical Observatory; U.S. = United States.
Source: State Land Use Law (Chapter 205, Hawai'i Revised Statutes).

The Main Base consists of the fee simple lands held by the U.S. Government. Mānā Plain is east of the Main Base and is utilized for agriculture and is bordered by the Kekaha Game Management Area (which encompasses Kamokalā Ridge and Mānā Well). The southern boundary for the Main Base ends at Kokole Point. Miloli'i Ridge and Mākaha Ridge are located within the Pu'u Ka Pele Forest Reserve managed by DLNR, DOFAW. Adjacent to Mākaha Ridge, KPGO is located within Kōke'e State Park, which is managed by DLNR, State Parks Division. Both are accessible by Kōke'e Road (Figure 1-2).

Land uses in the Project Area include public beach access, local and federal government activities, agriculture, hiking, hunting, and other public uses. Highway 50 (also known as Kaumuali'i Highway) is the primary public access route through the Main Base (Figure 1-2).

The Draft EIS will evaluate potential impacts to land use from implementation of the Proposed Action and alternatives.

3.5 Socioeconomics

The area that will be considered for socioeconomic analysis is the County of Kaua'i.

Population Characteristics. In 2021, the population of the County of Kaua'i was 73,247, representing approximately 5 percent of the total population for the state. The population of the County of Kaua'i grew 9.2 percent from 2010 to 2021. This growth rate was faster than for the state (6.9 percent) and U.S. (6.8 percent) over the same period. Table 3.5-1 shows 2010 and 2021 population data.

Table 3.5-1 Population of the County of Kaua‘i, State of Hawai‘i, and United States (2010 and 2021)

Location	*2010*	*2021*	*Percent Change*
United States	308,745,538	329,725,481	6.8
State of Hawai‘i	1,360,301	1,453,498	6.9
County of Kaua‘i	67,091	73,247	9.2

Sources: U.S. Census Bureau, 2010, 2022a.

Employment Characteristics. In 2021, 36,294 individuals in the County of Kaua‘i were employed in the civilian labor force and 239 individuals in the armed forces (U.S. Census Bureau [USCB], 2022b). The three largest civilian-employed industries in the County of Kaua‘i in terms of workforce employed are arts, entertainment, recreation, accommodations, and food services (23.1 percent); educational services, health care, and social assistance (17.8 percent); and retail trade (11.4 percent) (USCB, 2022b). PMRF is currently the largest high-tech and third-largest overall employer on Kaua‘i with nearly 1,000 personnel, including defense personnel and civilian contractors (State of Hawai‘i Department of Business, Economic Development, and Tourism 2023). The median household income for the County of Kaua‘i was $86,287 compared to the statewide median household income of $88,005 (USCB, 2022b). In 2021, the Bureau of Labor Statistics reported an 8.1 percent unemployment rate in the County of Kaua‘i, which is higher than the U.S. (5.3 percent) and the State of Hawai‘i (6.0 percent) (Bureau of Labor Statistics, 2021, 2023).

The Draft EIS will include an analysis of potential socioeconomic impacts from implementation of the Proposed Action and alternatives.

3.6 Environmental Justice

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,* directs agencies to address environmental and human health conditions in minority and low-income communities. Environmental justice addresses the disproportionate and adverse impacts of a federal action on low-income or minority populations. The intent of the order and related directives and regulations is to ensure that low-income and minority populations do not bear a disproportionate burden of adverse impacts resulting from federal actions.

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, directs each federal agency to make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children, and ensure that its activities and standards address disproportionate risks to children that result from environmental health or safety risks.

Impacts associated with environmental justice would be to disadvantaged communities that could be adversely affected by the Proposed Action. The West Kaua‘i Community Plan was adopted in 2020 and guides the long-term development, growth, and maintenance in the Waimea-Kekaha and Hanapēpē-‘Ele‘ele districts. The West Kaua‘i Community Plan recognizes that challenges, such as a lack of housing to the growing effects of climate change, will negatively impact vulnerable households disproportionately (County of Kaua‘i, 2020). The potential disadvantaged communities would be identified based on the spatial distribution of low-income and minority populations in the Project Area. As defined by the Environmental Justice Guidance under NEPA (CEQ, 1997), minority populations include persons who identify themselves as Asian, Native Hawaiian or other Pacific Islander, Native American or Alaskan Native, Black (not of Hispanic origin), or Hispanic or Latino. A minority population

exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population. In addition, a minority population also exists if there is more than one minority group present and the minority percentage, when calculated by aggregating all minority persons, meets one of the above thresholds (CEQ, 1997).

The Draft EIS will consider whether there are such disadvantaged communities on West Kaua‘i within the vicinity of PMRF and, if so, assess whether the Proposed Action results in disproportionate and adverse impacts on environmental and human health conditions in minority and low-income communities. Potentially disadvantaged communities will be identified by comparing communities on West Kaua‘i within the vicinity of PMRF to demographic and socioeconomic indicators for the County of Kaua‘i as a whole.

3.7 Water Resources

Water resources include surface water (e.g., streams, lakes, rivers, and wetlands), groundwater, floodplains, and coastal waters, which comprise watershed hydrology.

Mean annual rainfall at the Main Base is approximately 20 inches. The developed water system, consisting of three human-made open irrigation ditches through the agricultural lands on Mānā Coastal Plain draining into the Pacific Ocean, is fed by upland streams, surface waters, and associated sediment. Wetlands, floodplains, mudflats, and shallow ponds are present along the lowlands and coastal regions (Figure 3.7-1). The only natural wetland habitat on the Main Base comprises estuarine and marine systems along the shoreline region. A human-made sewage oxidation pond complex is located on the southern portion of the Main Base.

Mean annual rainfall in the Kamokalā Ridge area is 20 inches. Surface water from Nahomalu Valley (north) and Ka‘awaloa Valley (south) of Kamokalā Ridge drains into the Mānā Plain. A basal unconfined dike aquifer is located in the Waimea Aquifer Sector within the Kekaha Aquifer System (Figure 3.7-2).

Mean annual rainfall in Mānā is approximately 20 inches. Mānā Well, located at the southeastern end of Kamokalā Ridge, pumps water upwards from a below-ground aquifer. The water from the well is properly treated before it is piped into the PMRF drinking water distribution system. Drinking water on the Main Base is provided by Mānā Well, as well as the County of Kaua‘i’s Waimea-Kekaha system.

Mean annual rainfall on Miloli‘i Ridge is 30 inches. Due to the rocky, stony, and volcanic makeup of the terrain on Miloli‘i Ridge, runoff is rapid and erosion is prevalent. There are no perennial water features and no groundwater resources.

Mean annual rainfall at Mākaha Ridge is 30 inches. Due to the rocky, stony, and volcanic makeup of the terrain on Mākaha ridge, runoff is rapid and erosion is prevalent. There are no perennial water features, only intermittent streams in the region. Two aquifers, both part of the Waimea Aquifer Sector of the Kekaha Aquifer System, are beneath this site (Figure 3.7-2).

Mean annual rainfall on the Kaunuohua Ridge at KPGO ranges from 50 to 60 inches. Surface water runoff is medium due to highly-eroded volcanic terrain on the ridgeline, and generally follows a northwesterly/southeasterly course. Numerous streams are located around the base of the mountains. One unconfined dike aquifer, located in the Waimea Aquifer Sector within the Kekaha Aquifer System, lies beneath KPGO.

Figure 3.7-1 NWI Wetlands

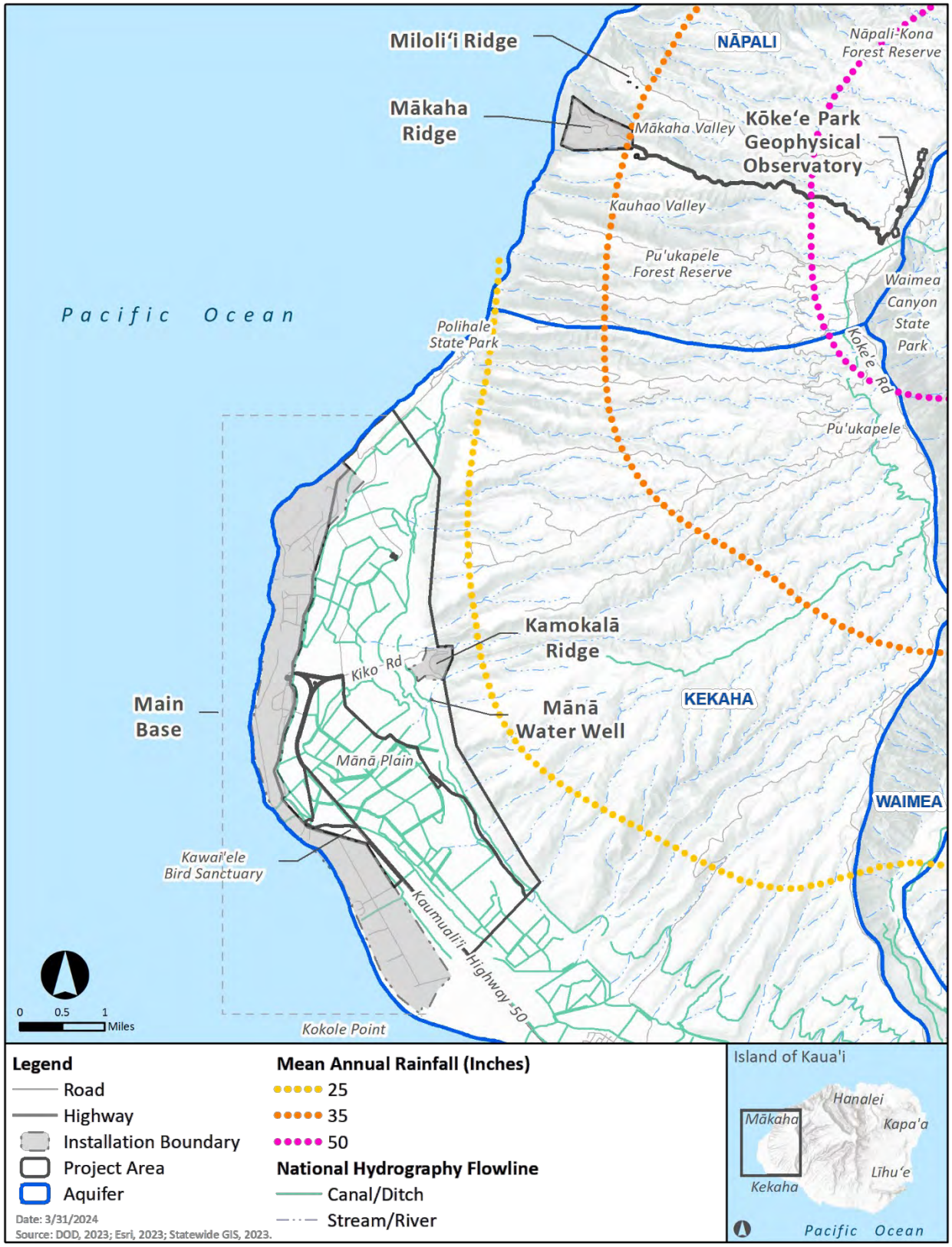

Figure 3.7-2 Aquifers

The Draft EIS will evaluate potential impacts to water resources from implementation of the Proposed Action and alternatives.

3.8 Utilities

There are utility leases and easements included as part of the Proposed Action. Utility systems' usage, available supply capacity, and the overall real property condition of the utility systems will be analyzed. The primary utilities that will be assessed in the Draft EIS are potable water, wastewater, electrical, and communications.

Potable water for the Main Base lease areas comes primarily from Mānā Water Well. Potable water resources for Kamokalā Ridge, Mākaha Ridge, and KPGO are supplied by either existing wells or municipal sources from several reservoirs. The Navy treats water from all sources, except water provided by the State of Hawaiʻi (Navy, 2008).

Wastewater services for PMRF include domestic sewage treatment facilities and a collection system that services PMRF (Navy, 2008). The Kamokalā Ridge, Mākaha Ridge, and KPGO wastewater utility supply and uses will be identified in the Draft EIS.

Primary electric power is supplied to the Main Base, Kamokalā Ridge, and Mānā Water Well by purchase from the Kauaʻi Island Utility Cooperative and a 14-megawatt solar facility with a 70 megawatt-hour battery energy storage system on the Main Base (Figure 3.8-1). KPGO power is supplied by a Navy-operated power plant at Mākaha Ridge. Electricity is provided through both overhead and underground transmission lines. Emergency diesel backup generators provide alternate power when needed at KPGO. Communications infrastructure for the Main Base, Kamokalā Ridge, Mākaha Ridge, and KPGO consist of cable, fiber optics, cellular towers, and communications towers.

The Draft EIS will analyze potential impacts to utilities from implementation of the Proposed Action and alternatives.

Photo courtesy of U.S. Navy, November 16, 2021.

Figure 3.8-1 Solar Facility and Battery Energy Storage System

3.9 Public Health and Safety

Public health and safety pertains to activities, occurrences, and training, and RDT&E activities that have the potential to affect the well-being, safety, and health of the public.

NASA operates KPGO in accordance with the Environmental Management Plan under the Space Exploration Network Services and Evolution contract. To ensure operations at KPGO do not result in impacts to public safety or the environment, the Environmental Management Plan describes procedures for the following: environmental planning; risk assessment; spill prevention; operational controls; education, training, awareness, and competency; evaluation, checking, and corrective action; water management; air quality management; and waste management.

Range Safety at PMRF is controlled by Range Control, which is responsible for hazard area surveillance and clearance and control of all operational areas. Range Control maintains real-time surveillance, clearance, and safety at all PMRF areas. The PMRF Range Safety Officer is responsible for establishing Ground Hazard Areas (GHAs) and Launch Hazard Areas over water. The Ground and Launch Hazard Areas for missile launches are determined by size and flight characteristics of the missile, as well as individual flight profiles of each flight test. Data processed by ground-based or onboard missile computer systems may be used to recognize malfunctions and terminate missile flight. Before a launch is allowed to proceed, the Navy uses input from ship sensors, visual surveillance from aircraft and range safety boats, radar data, and acoustic information to ensure the offshore range is clear of vessels and aircraft.

PMRF operates pursuant to Range Commanders Council 321, *Common Risk Criteria for National Test Ranges*. Range Commanders Council 321 sets requirements for minimally acceptable risk criteria to occupational and non-occupational personnel, test facilities, and non-military assets during range operations.

Ordnance safety includes procedures to prevent premature, unintentional, or unauthorized detonation of ordnance. All programs require an Explosive Safety Approval before ordnance is allowed on PMRF or used on a test range. This approval involves a detailed analysis of the explosives and of the proposed training and RDT&E activities. The analysis also covers procedures and facilities for surveillance and control, an adequacy analysis of movement and control procedures, and a design review of the facilities where the ordnance items will be handled.

PMRF transports ordnance by truck from Nāwiliwili Harbor to the Main Base along Highway 50 (Figure 3.9-1). The barges carrying ordnance are met at Nāwiliwili Harbor by trained ordnance personnel and special vehicles for transit and delivery to PMRF. PMRF Instruction 8023.G controls the handling and transportation of ammunition, explosives, and hazardous materials on the facility. All ordnance is transported in accordance with PMRF Instruction 8023.G and U.S. Department of Transportation regulations.

Ambulance and Class II Emergency Medical Technician services are provided by Emergency Medical Technicians assigned to Crash/Fire. These contractor-operated services are available to military, civil service, and non-government personnel at PMRF, 24 hours a day, 7 days a week. More extensive emergency medical services are available from the West Kaua‘i Medical Center in Waimea, 10 miles from PMRF’s main gate (Figure 3.9-1).

Figure 3.9-1 Ordnance Transport Route and Emergency Medical Services Route

Fire service at the Main Base includes PMRF Crash/Fire equipment located at the Air Traffic Control Tower. Personnel are trained to respond to activities such as aircraft firefighting and rescue in support of airfield operations, hazardous material incidents, confined space rescue, and hypergolic fuel releases, plus structure and brush firefighting, fire prevention instruction, and fire inspections.

The Draft EIS will evaluate potential impacts to public health and safety from implementation of the Proposed Action and alternatives.

3.10 Air Quality and Greenhouse Gases

3.10.1 Air Quality

The U.S. Environmental Protection Agency (USEPA) has established National Ambient Air Quality Standards (NAAQS) for the criteria pollutants sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), lead, particulate matter (PM) measured less than or equal to 10 microns in diameter (PM_{10}), and PM less than or equal to 2.5 microns in diameter [$PM_{2.5}$]).

The Hawaiʻi Department of Health (DOH), Clean Air Branch regulates and monitors air pollutants under HAR Chapter 11-59, *Ambient Air Quality Standards*, and HAR Chapter 11-60.1, *Air Pollution Control*. Based on ambient air monitoring results, the island of Kauaʻi is designated unclassified/attainment for all criteria pollutants (USEPA, 2023). The Clean Air Branch currently operates one monitoring station on the island of Kauaʻi approximately 1.0 mile downwind of Nāwiliwili Harbor to measure SO_2 emissions from cruise ships (DOH, 2023).

The prevailing winds on Kauaʻi (known as trade winds) blow in from east-northeast and prevail approximately 9 months of the year. When there is volcanic activity, trade winds blow volcanic fog ("vog") from Hawaiʻi Island volcanoes. When trade winds are absent for prolonged periods, vog travels up the island chain and can affect air quality by increasing levels of airborne SO_2 and $PM_{2.5}$.

Sources of air emissions from the Navy include vehicle traffic, diesel-fuel powered generators, aircraft, power generation, and rocket launches. Sources of air emissions from NASA include vehicle traffic and the diesel power generator.

The Draft EIS will assess the potential impacts to air quality from implementation of the Proposed Action and alternatives.

3.10.2 Greenhouse Gases

Gases that trap heat in the atmosphere are called greenhouse gases (GHGs). Global climate change is impacting temperature, precipitation, wind, sea level, and other elements of Earth's climate system. The recent buildup of GHGs in the atmosphere from human activities has changed the earth's climate and has resulted in adverse effects to human health and welfare, and to ecosystems.

Sea level rise, altered rainfall patterns, and rising ocean and air temperatures result from climate change. These changes impair access to clean water and healthy food, undermine human health, threaten the cultural and built environment, exacerbate inequities, and disrupt economic activity and diversity of ecosystems in Hawaiʻi (U.S. Global Change Research Program, 2023).

The Draft EIS will analyze potential impacts from GHGs and climate change from implementation of the Proposed Action and alternatives.

3.11 Transportation

The roadways used to access or in the vicinity of PMRF include Highway 50, Kōkeʻe Road, Kao Road/Kiko Road, Mānā Road, Mākaha Ridge Road, and Miloliʻi Ridge Road.

Highway 50 is a principal arterial roadway providing regional mobility in the western part of Kauaʻi. It begins in Līhuʻe and ends in the vicinity of PMRF, where it is a two-lane, undivided roadway with painted shoulders along both sides of the road. There are median left turn lanes at selected intersections along Highway 50.

Kōkeʻe Road branches north from Highway 50 in Waimea and provides access from Kekaha to Waimea Canyon State Park and Kōkeʻe State Park. It also provides access to the KPGO site. In the vicinity of the KPGO site, it is a two-lane, undivided roadway with grass shoulders along both sides of the road.

The Draft EIS will analyze the potential impacts of the Proposed Action and alternatives on the roadway facilities in the vicinity of the PMRF and KPGO sites along with multi-modal facilities, such as pedestrian, bicycle, and public transit facilities.

3.12 Hazardous Materials and Wastes

Hazardous materials are currently utilized or present on lease and easement lands at KPGO, the Main Base, and Mākaha Ridge.

Hazardous materials present on the Main Base leased area include the following: cleaning agents, solvents, lubricating oils, jet fuel, diesel fuel, propane, gasoline, aqueous film forming foam[2] (AFFF), chlorine, used oil, and paint. No known components within the Main Base leased area contain polychlorinated biphenyls (PCBs). PMRF's management and disposal procedures for used oils and fuels are in its Hazardous Waste Management Plan. Most waste is collected and containerized at the Main Base leased area for direct offsite disposal through the Defense Reutilization and Marketing Office, which also provides for the transportation and disposal of the waste to a final disposal facility.

PMRF uses gasoline and diesel fuel to power trucks and equipment across leasehold areas. Table 3.12-1 includes a summary of fuel storage on PMRF leased lands and KPGO.

Hazardous materials on Mākaha Ridge include diesel storage tanks and oil storage tanks. Used oil is taken to the Main Base to be recycled.

KPGO Site B has multiple diesel fuel tanks used for emergency power generation. Site B also has a hazardous material storage facility which holds paint, oil, mechanical lubricating fluids, and cleaning

[2] Based on guidance from the Assistant Secretary of the Navy, DON has strict firefighting performance requirements for AFFF formulations to protect the safety of our personnel and the public in the event of an emergency. DON amended the MILSPEC in September 2017 setting limits for PFOS and PFOA at the lowest levels of quantitation while maintaining fire-fighting performance requirements. DON is in the process of removing legacy AFFF and replacing it with new MILSPEC compliant AFFF. DON has also implemented system requirements to ensure DON installations and facilities are tested and certified in a manner that does not allow the release of legacy AFFF into the environment. MIL-PRF-32725 limits per- and polyfluoroalkyl substances (PFAS) to 1 part per billion, and Section 322 of the National Defense Authorization Act for Fiscal Year 2020 requires DoD to stop using AFFF containing PFAS on all installations by 1 October 2024.

substances. Used oil is taken to the Main Base to be recycled. NASA's Environmental Management Plan for KPGO describes waste management processes including handling of solid waste, recyclable materials, hazardous waste management, hazardous waste shipment, universal waste management, asbestos management, PCBs, and compliance with the Emergency Planning and Community Right-to-Know Act.

Table 3.12-1 PMRF Leased Area and KPGO Fuel Storage Locations

Fuel Storage Types	*Quantity*	*Capacity (nominal capacity) in gallons*	*Details*
Diesel ASTs	2	8,000	Mākaha Ridge
Diesel AST	3	275	Mākaha Ridge
Diesel USTs	1	25,000	KPGO Site B
Diesel USTs	2	500	KPGO Site B
Diesel ST	2	55	KPGO Site B
Diesel ST	1	244	KPGO Site B
Diesel ST	1	256	KPGO Site B

Key: AST = aboveground storage tank, UST = underground storage tank, ST = Storage Tank.

PMRF has a pollution prevention plan for all sites on Kaua'i, which follows the Navy's Consolidated Hazardous Materials Reutilization and Inventory Management Program for controlling, tracking, and reducing hazardous materials use and waste generation. Current programs involve waste elimination from toner cartridges, mercury from mercury lamps, and acid/lead batteries and asbestos management. Asbestos is managed in accordance with the base asbestos management plan which requires all structures on leased and easement land areas to be surveyed, and any asbestos removed by a certified asbestos contractor prior to disturbance/construction. Lead-based paint waste removal follows Department of Energy protocols, and all facilities on PMRF leased lands follow the lead-based paint management plan.

The Draft EIS will evaluate potential impacts to hazardous materials and wastes from implementation of the Proposed Action and alternatives.

3.13 Visual Resources

The discussion of visual resources includes the natural and built features of the landscape visible from viewpoints that contribute to an area's visual quality. Under NEPA, federal agencies should consider visual impacts of proposed projects on scenic resources, historic properties, and scenic experiences of public who view the landscape. Aesthetics and views of proposed projects at PMRF and the NASA lease area are mainly guided by the Kaua'i County General Plan (County of Kaua'i, 2018) or the West Kaua'i Community Plan (County of Kaua'i, 2020). Both plans include policies to preserve scenic views of ocean, coastline/beach areas, mountains, and other elevated landforms.

The Main Base leaseholds and easements are situated on the west coast of Kaua'i on the Mānā Coastal Plain (refer to Figure 1-2). The leased and easement areas in this area are relatively flat and consist primarily of agricultural and other undeveloped, partially-vegetated lands. The ridges that run east of these areas are the dominant view from the Main Base. The Pacific Ocean and coastlines can be viewed from higher elevation vantage points. Kaumuali'i Highway (Highway 50) is the main paved roadway in this area. Typical views from the highway include mixed vegetation and agricultural areas along both

sides of the road, with the mountains visible in the distance to the east, if travelling northbound on Kaumualiʻi Highway toward Barking Sands Beach and Polihale State Park. The facilities on these leaseholds and fee simple lands are visible to the west for some stretches when travelling northbound on Kaumualiʻi Highway.

The Kamokalā Ridge leaseholds are located upland from the Main Base. The ordnance storage facility and paved access roads are the primary human-made structures in the area. Vegetation of various heights is adjacent to both sides of the access roads. Obscured views of the Pacific Ocean and coastlines occur from certain vantage points along the roadway. Due to its higher elevation and the relatively dense vegetation in this area, the ordnance storage facility is not visible from the Main Base, Kaumualiʻi Highway, or other public roads west of the Kamokalā Ridge lease area.

The Mānā Water Well is approximately a quarter mile south of the Kamokalā Ridge area. The well is located at the point where the topography changes from flat to steep mountain cliffs. The site is reached by an access road from Kiko Road (Figure 1-4). Mountain views are dominant from this location because the nearest cliff line is less than a quarter mile from the well. No ocean or coastline views are available from this location.

Miloliʻi Ridge and Mākaha Ridge are both finger ridges of the Nāpali Coast on the west-northwest side of Kauaʻi within Puʻukapele Forest Reserve areas. The Miloliʻi Ridge lease area is approximately 8 miles north of the Main Base. Views of the Pacific Ocean and coastlines are not available due to dense vegetation coverage at this site. The facilities at Miloliʻi Ridge are not visible from public vantage points because of its secluded location.

The Mākaha Ridge area is located on the cliffs of the Nāpali Coast State Wilderness Park, approximately 1 mile south of Miloliʻi Ridge. Mākaha Ridge is accessed via the Mākaha Ridge Road (refer to Figure 2-7), which can be accessed by the public up to a gate outside of the radar site. Mākaha Ridge Road has forest vegetation lining both sides of the road, obstructing a view of any vista. The radar facilities are only partially visible from the segment of the Mākaha Ridge Road near the radar site gate.

The NASA lease area is located at the Kōkeʻe Park, approximately half a mile northeast of Mākaha Ridge Road. The site can be accessed through Kōkeʻe Road and Faye Road. Site facilities are located on landscaped or paved areas. The site is surrounded by taller forest vegetation. The heavily vegetated setting and mountain views are the main scenic resources from this area. The NASA facilities are partially visible to Kōkeʻe State Park visitors while traveling along Mākaha Ridge Road.

As part of the visual resources impacts evaluation, the Draft EIS will discuss visual resources in detail from the perspectives of dominant landscape features, visual diversity, elements of line, color, form, and texture, historic and cultural importance, as well as overall landscape character. The Draft EIS will evaluate potential impacts to visual resources from implementation of the Proposed Action and alternatives.

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4 Consistency with State and Local Government Plans and Policies

The Draft EIS will evaluate the Proposed Action's conformance with relevant state and local land use plans and policies.

4.1 Land Use Laws

The Draft EIS will include a discussion of the Proposed Action's conformance with relevant federal, state, and County of Kaua'i land use plans, policies, and controls.

4.2 Hawai'i State Plan and Hawai'i State Functional Plans

The Hawai'i State Plan, codified as HRS Chapter 226, establishes a set of themes, goals, objectives, and policies that are meant to guide the state's long-term growth and development activities. The Hawai'i State Plan also provides a basis for determining priorities, allocating limited resources, and improving the coordination between State and County plans, policies, programs, projects, and regulatory activities. These goals seek to promote a strong economy, a desired physical environment, and nourished community life. The State Plan also establishes objectives for each goal. The Proposed Action meets the statewide objectives by encouraging federal expenditures and national defense that is consistent with "Hawai'i's social, environmental, and cultural goals by building upon dual-use and defense applications" (HRS § 226-9). As stewards of the natural and cultural environment, the Navy and NASA work to enhance Hawai'i's scenic assets, natural beauty, and multi-cultural resources pursuant to HRS § 226-12.

The State Plan (HRS § 226-65) also initiated the Hawai'i 2050 Sustainability Plan to serve as long-range planning to achieve sustainability and climate adaptation goals, principles, and policies. Published in 2008, the plan reinforces the goals and objectives of the State Plan (above) in terms of economic, physical, and community sustainability with the objectives of promoting these sectors through renewable energy, water conservation, and increased food security, among others; an approach fully supported by the Proposed Action (Sustainability Task Force, 2008).

The Statewide Planning System identified in HRS Chapter 226 also requires State Functional Plans, which implement state and county actions. There are 13 Functional Plans used to assist with establishing the policies, statewide guidelines, and priorities within a specific field of activity when such an activity or program is proposed, administered, or funded by any state agency. Due to the nature of the leased and easement lands that fall under the Proposed Action, multiple Functional Plans may be applicable for the Draft EIS, including the Agriculture Functional Plan, the Conservation Lands State Functional Plan, the Historic Preservation State Functional Plan, and the Recreation State Functional Plan. All of these applicable Functional Plans were developed in 1991.

4.3 Kaua'i County General Plan, West Kaua'i Community Plan, Kaua'i Island Plan

The Kaua'i County General Plan underwent a comprehensive update in 2018 and serves as the county's guiding policy framework for growth, land use, and development issues. The Project Area falls within the Waimea-Kekaha Planning District and land uses include agriculture, natural preserve, and parks and recreation. The Proposed Action fits within this General Plan's future land use concept and is consistent with applicable goals and policies (County of Kaua'i, 2018). As stated in the Kaua'i County General Plan, Section 3.3 fostering High Tech and Clean Tech Jobs:

> The Pacific Missile Range Facility (PMRF), located on the West Side, is one of the foremost aerospace test sites in the United States. PMRF leverages Kaua‘i’s location in the center of the Pacific Ocean for the benefit of aerospace and space launch testing .... Historically, PMRF has been the driving force behind the establishment of technology-based business on Kaua‘i. PMRF’s continued vitality contributes significantly to Kaua‘i’s high technology industry and provides opportunities for supportive businesses and entrepreneurs (County of Kaua‘i, 2018).

Land uses at PMRF are consistent with the 2020 West Kaua‘i Community Plan, and include the following three general areas: Hanapēpē, Kekaha, and Waimea uplands (County of Kaua‘i, 2020). The project is consistent with the applicable policies regarding heritage resources, resiliency, and shared spaces in the West Kaua‘i Community Plan. As stated in the West Kaua‘i Community Plan, Part IV: Other Communities and Significant Areas:

> Over the decades, PMRF has increased its connection with Kekaha and the West Kaua‘i Community, such as development of the Junior Professional Program for high school students, restoration of the Kawai‘ele Bird Sanctuary, establishment of protocols for the care and internment of inadvertently uncovered iwi, and support and partnership with local businesses and nonprofits (County of Kaua‘i, 2020).

A separate Kaua‘i Island Plan, last updated in 2004 and produced by the State of Hawai‘i Department of Hawaiian Home Lands (DHHL), covers lands owned by the DHHL, which includes 15,061 acres adjacent to the Project Area in Waimea (DHHL, 2004) (Figure 4-1). PMRF is located in the coastal plain below the DHHL Mānā Plain property, and just north of State of Hawai‘i Department of Hawaiian Home Lands Kekaha tracts. The project is consistent with land use plans for these two areas.

4.4 List of Potentially Required Permits, Consultations, Reviews, and Approvals

The Navy and NASA will prepare the Draft EIS with input, analysis, and review from the public and local, state, and federal agencies. The anticipated permits, consultations, reviews, and approvals required for implementation of the Proposed Action will depend on the features of the selected alternative. The list of anticipated permits and approvals in Table 4-1 will be refined as alternatives are developed. Input on other processes that may be necessary will be requested from government agencies and other participants as part of this environmental review process.

The Draft EIS will list all permits, consultations, reviews, and approvals necessary to implement the Proposed Action, including those overarching requirements listed in Table 4-1. Because the Proposed Action is a land management proposal, the associated permits and approvals are related to land use arrangements and resource management.

Table 4-1 Potential Required Permits, Consultations, Reviews, and Approvals for the Proposed Action

Potential Required Permits and Approvals	*Regulatory Agency*
Approval of request for new real estate agreements (HRS Chapter 171)	**BLNR**
Conservation District Use Application (HAR Title 13, ch. 5)	**DLNR, Office of Conservation and Coastal Lands**
NHPA (54 U.S.C. section 100101)	ACHP and the Hawai‘i SHPO
ESA (16 U.S.C. section 1531 et seq.)	USFWS and NMFS[1]
CWA (33 U.S.C. section 1344)	USEPA and Hawai‘i State Department of Health
CZMA, Subpart C (16 U.S.C. section 1451, et seq.)	Hawai‘i Office of Planning and Sustainable Development
Hawai‘i Historic Preservation Review HRS Chapter 6E-42 and HAR Chapter 13-275	DLNR, SHPD

Note: **Bold text** in table indicates approvals necessitating HRS Chapter 343 environmental review.

[1] This is pending review of monk seal haul-out on easement land; additional review of ESA species is covered in the *Hawaii-Southern California Training and Testing Final EIS/OEIS* (Navy, 2018).

Key: ACHP = Advisory Council on Historic Preservation; BLNR = Board of Land and Natural Resources; CWA = Clean Water Act; CZMA = Coastal Zone Management Act; DLNR = Department of Land and Natural Resources; ESA = Endangered Species Act; HAR = Hawai‘i Administrative Rules; HRS = Hawai‘i Revised Statutes; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; SHPD = State Historic Preservation Division; SHPO = State Historic Preservation Officer; U.S.C. = United States Code; USEPA = U.S. Environmental Protection Agency; USFWS = United States Fish and Wildlife Service.

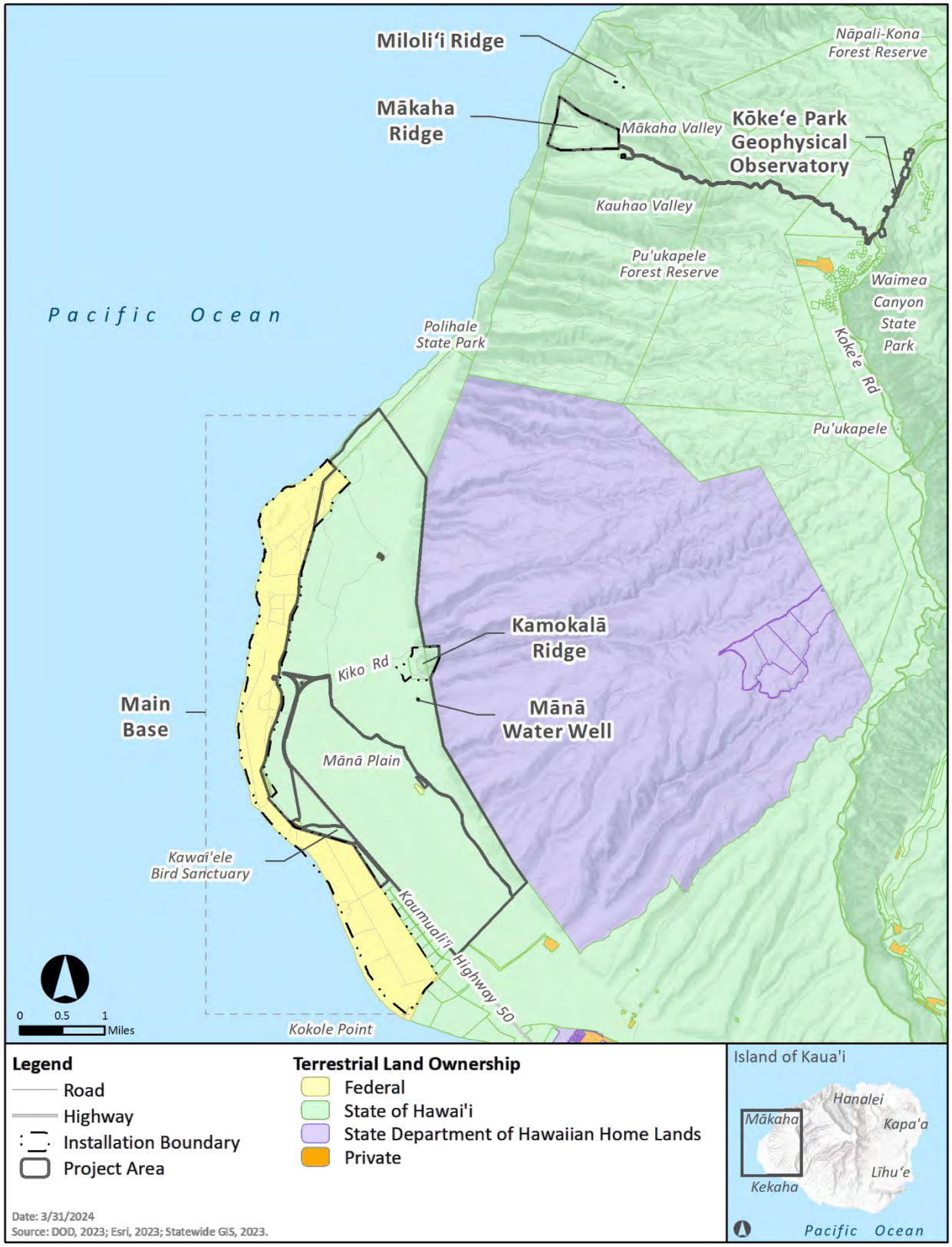

Figure 4-1 Terrestrial Land Ownership

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Appendix A
Summary of Land Use at the Pacific Missile Range Facility

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ACRONYMS AND ABBREVIATIONS

ft	foot or feet
ha	hectare
ICRMP	Integrated Cultural Resources Management Plan
km	kilometer
m	meter
mi	mile
Navy	Department of the Navy, United States
PMRF	Pacific Missile Range Facility
U.S.	United States
WWII	World War II

GLOSSARY OF HAWAIIAN LANGUAGE WORDS

Hawaiian Spelling [a]	**Definition**
‘a‘ali‘i	Hawaiian hopseed, *Dodonaea viscosa*; native shrubs and small trees
ahupua‘a	land division usually extending from the uplands to the sea, so called because the boundary was marked by a heap (*ahu*) of stones surmounted by an image of a pig (*pua‘a*), or because a pig or other tribute was laid on the altar as tax to the chief
heiau	temple, shrine
hi‘aloa	small, downy, American weed, *Waltheria indica* var. *americana*; leaves and inner bark of root are very bitter and are used for tea or chewed to relieve sore throat
koa	the largest of native forest trees (*Acacia koa*), with light gray bark, crescent-shaped leaves, and white flowers in small, round heads
konohiki	headman of an ahupua‘a land division under the chief
loko	pond, lake, pool
makaloa	a perennial sedge, *Cyperus laevigatus*
mauka	toward the mountain, or inland
neki	great bulrush
pu‘uone	pond near the shore connected to the sea by a stream or ditch; sand dune

[a] Adapted from Mary K. Pukui and Samuel H. Elbert, 1986, *Hawaiian Dictionary*, University of Hawai‘i Press, Honolulu, unless otherwise noted.

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1 Introduction

1.1 Project Scope

The Pacific Missile Range Facility (PMRF) consists of approximately 10,281 acres (ac), of which approximately 1,933 ac are United States (U.S.) fee simple lands under the administrative jurisdiction of the U.S. Department of the Navy (Navy). The balance of 8,348 ac is state land comprised of 684 ac of leaseholds and 7,664 ac of easements.

No active training or testing occurs on state-owned property. Infrastructure that supports PMRF operations is located in the leaseholds. The easement areas provide safety buffer zones for training and testing missions and prevent incompatible development. The existing leases and easements were acquired from the State of Hawaiʻi, Department of Land and Natural Resources, and will expire between 2027 and 2030. The Navy is proposing to secure continued long-term Department of Defense use to support continued operational and mission requirements at PMRF. See Figure 1 and Figure 2 for the project areas of this summary.

The project consists of land that PMRF currently leases or has an easement for from the State of Hawaiʻi.

1.2 Project Location

The entirety of the project area is on the western edge of Waimea Ahupuaʻa, Kona District, Kauaʻi Island. The Controlled Industrial Area encompasses the Mākaha Ridge Tracking Station, Mākaha Ridge Road, boresight tower adjacent to Mākaha Ridge Road, and several large parcels east of PMRF Barking Sands on the Mānā Plain. The three primary study locations include Barking Sands, Mākaha Ridge Road and Kamokalā Ridge and portions of the surrounding area.

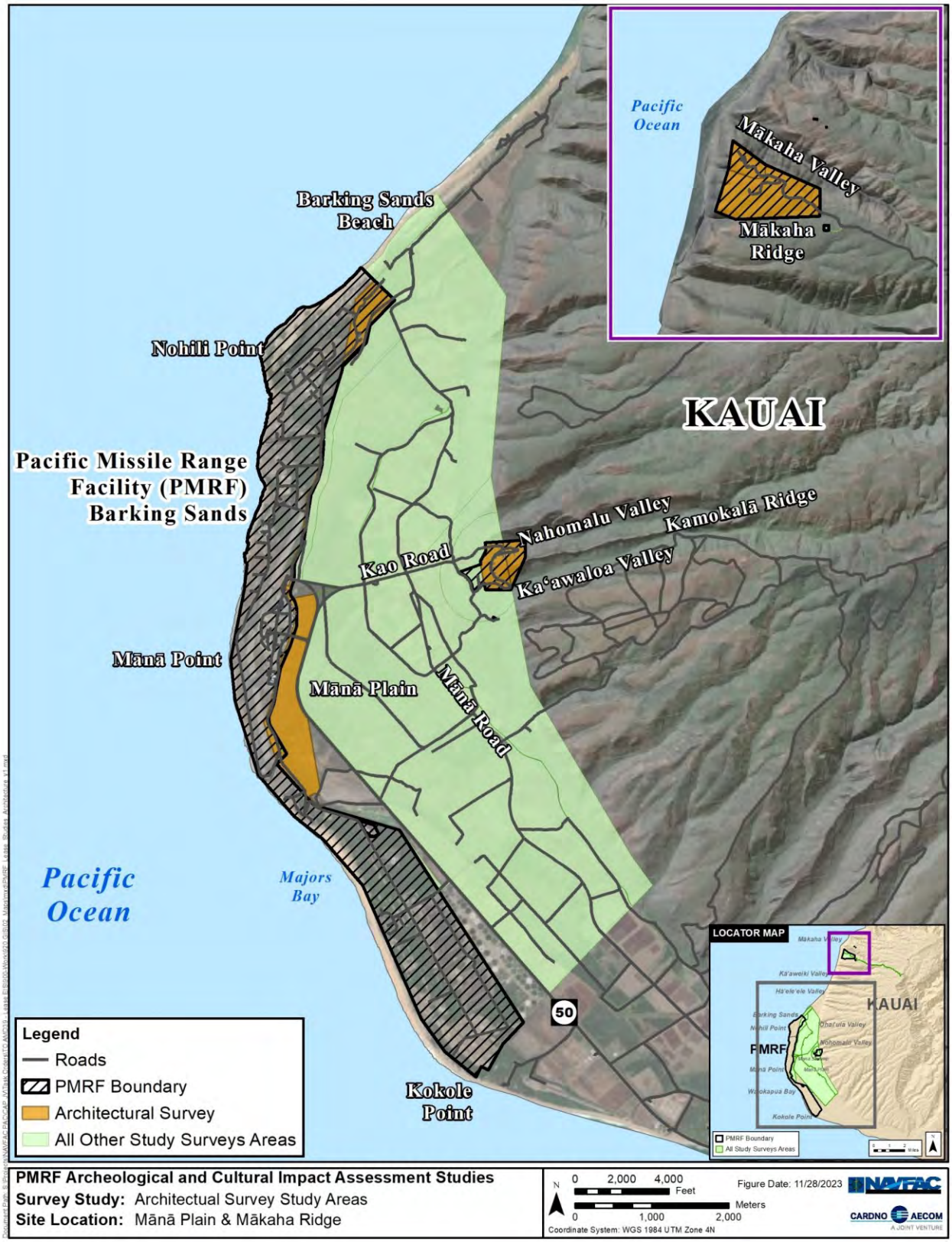

Figure 1 **Architectural survey areas in relation to PMRF Installation boundary and other survey areas.**

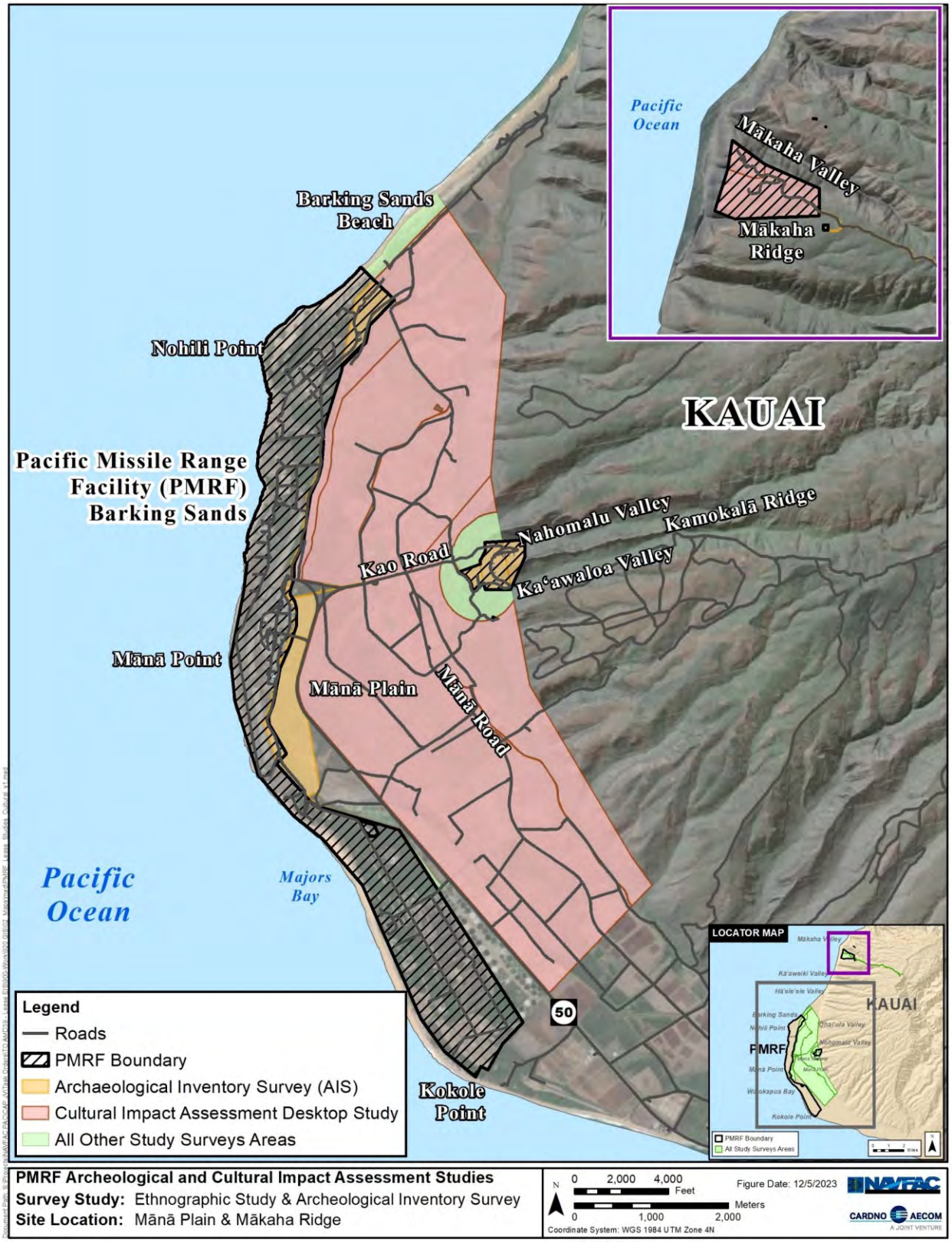

Figure 2 **Archaeology survey and Cultural Impact Assessment study area in relation to PMRF Installation boundary.**

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2 Background

This section presents background information to contextualize the current project and summarizes the physical environment, cultural and historical context, and previous archaeological research. Much of this information has been adapted from the 2005 and 2012 Integrated Cultural Resources Management Plans (ICRMPs) for PMRF (SEARCH 2012; Tomonari-Tuggle and Yoklavich 2005), Bell and Morrison (2009), Knecht and Rieth (2016). Clark et al. (2015) is a synthesized report summarizing information from previous ICRMPs and recent archaeological investigations and is also a common source for this background information. More detailed information about PMRF and the surrounding area can be found in the ICRMPs.

2.1 Physical Environment

PMRF occupies over 2,454 ac (993.5 ha) in five separate areas of the island of Kaua‘i: Barking Sands, Mākaha Ridge, Kōke‘e, Kamokalā Ridge on the west side, and Port Allen on the south shore. Barking Sands and Port Allen are coastal locations. Mākaha Ridge and Kōke‘e are situated on the central mountain mass of the island. Kamokalā Ridge is at the inland edge of the Mānā Plain at the base of the central mountain. The current cultural project is within and around the west side components of PMRF, which is the primary focus of this summary.

PMRF Barking Sands (the installation) covers more than 2,134 ac (864 ha) on the Mānā Plain. The installation occupies most of the coastal fringe of the plain, extending 7.77 miles (mi) (12.5 kilometers [km]) from Kokole Point in the south to Polihale State Park in the north. At its northern and southern boundaries, the installation is slightly over 0.62 mi (1 km) wide, narrowing to less than 0.31 mi (0.5 km) in the central portion. The northern two-thirds of the plain is a complex of three key physiographic features: coastal dune and back beach sands formed by aeolian and wave action, an arc of alluvial/colluvial deposition at the inland edge of the plain, and wetlands in the intermediate area. The southern third of the plain, in contrast, has a low dune, with relatively level soils extending back to the edge of the central mountain.

PMRF Mākaha Ridge Facility encompasses approximately 245 ac (99 ha) of a prominent Nā Pali ridgeline that overlooks the Mānā Plain. The ridge rises from 1,246.72 feet (ft) (380 meters [m]) to 1,853.67 ft (565 m) above sea level with an overall slope from east to west. The terrain surrounding the facility is steep, dropping quickly to the ocean along the west side and into narrow V-shaped drainages along the north and south sides.

PMRF Kamokalā Ridge is just inland from the Mānā Plain, in an area where the ancient 492.13 ft (150 m) to 656.17 ft (200 m) high sea cliffs have been incised by narrow, steep-walled gullies. The more gently sloped foothills at the base of the cliffs and mouths of the gullies have formed alluvial and colluvial arcs that project seaward. Kamokalā Ridge is bound by Nahomalu Valley to the north and Ka‘awaloa Valley to the south.

Rainfall across the survey area is very low, with mean annual precipitation averages of 15 to 20 inches (38–50.8 centimeters), increasing to 36 inches (91.44 centimeters) at Mākaha Ridge Tracking Station and gradually increasing further along Mākaha Ridge to the east with an average of 48 inches (121.92 centimeters) (Giambelluca et al. 2013). Most rain falls between October and April. The aridity of this region is caused by its location in the rain shadow of Mount Kawaikini and Mount Wai‘ale‘ale (Tuggle and Tomonari-Tuggle 1997:37). The average minimum annual temperature occurs in January and is approximately 71°F, and the average maximum temperature occurs in August and is 78°F (Giambelluca et al. 2013).

Numerous soil types are found in the survey area due to the variation in terrain (Figure 3 and Figure 4). The following soil descriptions are adapted from Foote et al. (1972).

Along the coastal survey areas, five primary soil series are present. The Jaucas series, and Jaucas loamy fine sand (JfB), soils are excessively drained, calcareous soils that occur as strips on coastal plains. These soils develop by alluvial and aeolian deposition of sand formed from coral and seashells. Jaucas loamy fine sand (JfB, 0–8 percent slopes) occurs on old beaches and windblown sand deposits in the western and southern areas of Kaua‘i. The Kaloko series, and Kaloko clay (Kf) and clay loam (Kfa), are poorly drained soils on coastal plains. These soils developed in alluvium derived from basic igneous rocks; the alluvium has been deposited over marly lagoon deposits. The Mamala series, and Mamala stony silty clay loam (MnC), 0-12% slopes, consist of shallow, well-drained soils along coastal plains. These soils formed in alluvium deposited over coral limestone and consolidated calcareous sand. The Lualualei series, and Lualualei clay (LuA), 0-2% slopes, consist of well-drained soils on coastal plains, alluvial fans, and talus slopes. These nearly level to gently sloping soils developed in alluvium and colluvium. The Nohili series, and Nohili clay (Nh), are poorly drained soils on coastal plains. These soils developed in alluvium that was deposited over marly lagoon deposits. Also present within this area are fill lands, which are low-lying or wetland areas that have been filled with bagasse and slurry from sugarcane processing, and dune lands, which are hills and ridges of sand drifted and piled by wind.

Along Kamokalā Ridge, two primary soil series are present. The Kekaha series, and Kekaha extremely stony silty clay loam (KOYE), 0-35% slopes, consist of well-drained soils on alluvial fans and flood plains that developed in alluvium washed from upland soils. The Waiawa series, and Waiawa extremely rocky clay (WJF), 30-80% slopes, are well-drained, very shallow, extremely rocky upland soils. These soils developed in colluvium and material weathered from basic igneous rock. Also present within this area are rubble lands, where 90 percent or more of the surface is covered by stones and boulders at the base of steep slopes.

Along Mākaha Ridge, five primary soil series are present. The Paaiki series, and Paaiki loam (PGE and PGF) 6-70% slopes, consists of well-drained soils on dissected uplands. These soils developed mainly in material weathered from basic igneous rock but partly in volcanic ash and ejecta. The Oli series, and Oli silt loam (OME and OMF), 10-70% slopes, consists of well-drained, moderately deep to deep soils on uplands. These soils developed in volcanic ash deposited over basic igneous rock. The Mahana series, and Mahana silt loam (MaD and MaE) 12-35% slopes, consists of well-drained soils on uplands. These soils developed in volcanic ash. The Puu Opae series, and Puu Opae silty clay loam (PwC and PwD), 8-40% slopes, consists of well-drained soils on uplands. These soils developed in material weathered from basic igneous rock. The Niu series, and Niu silty clay loam (NcC and NcD), 6-35% slopes, consists of well-drained soils on uplands. These soils developed in material weathered from basic igneous rock, possibly mixed with volcanic ash.

2.2 Traditional Land Use

Traditional land uses near the survey area include habitation, subsistence activities, burial, and travel. These topics are briefly summarized in the following sections.

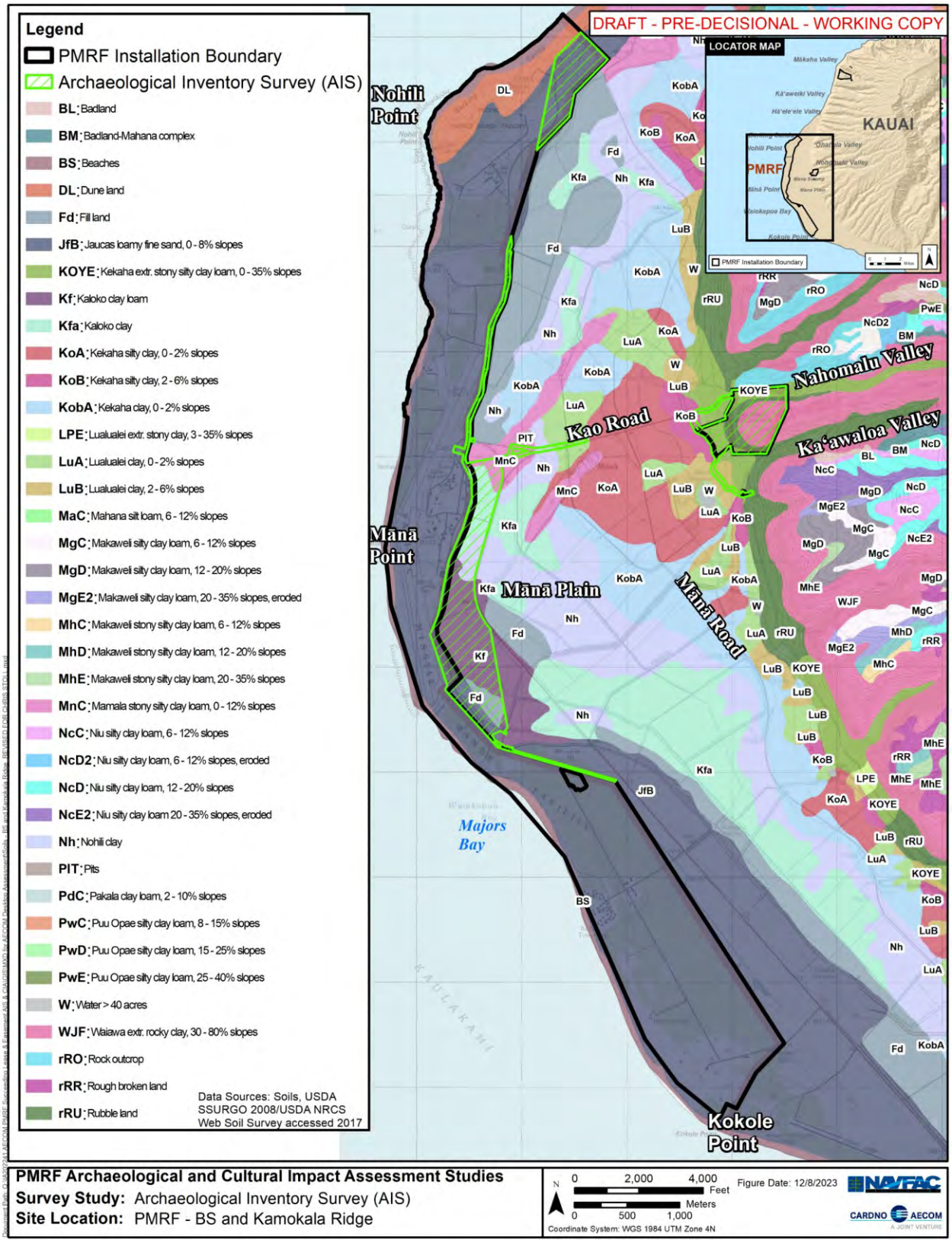

Figure 3 **USDA soil classes in the vicinity of the survey area at Barking Sands and Kamokalā Ridge.**

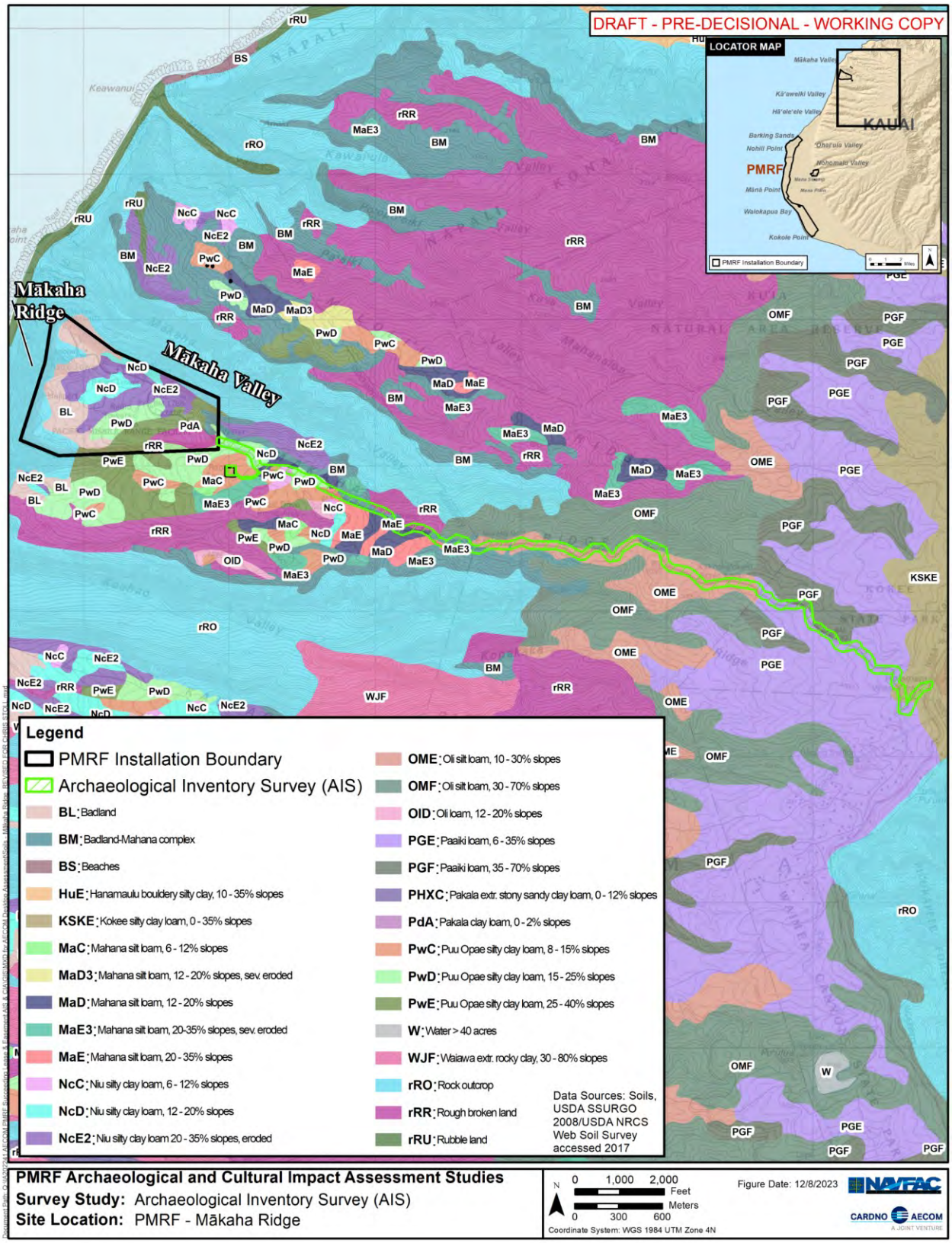

Figure 4 **USDA soil classes in the vicinity of the survey area at Mākaha Ridge.**

2.2.1 Settlement on the Mānā Plain

Wichman (1991:12), in relaying the story of Polihale, a konohiki (headman of an ahupuaʻa land division under the chief), describes the Mānā area in pre-Contact times as:

> … a land that stretched from the western cliffs of Na Pali to the eastern boundary shared with Waiawa. Mānā is a land of long white beaches with the ocean on one side and a large swamp that teemed with birds on the other. Inland of the marsh was a fertile strip of land where sweet potatoes and gourds were grown. Above these fields cliffs rose stiff backed, broken wide by valleys down which constantly flowed fresh spring or rain water. The ridges, covered with sandalwood and koa (*Acacia koa*) trees, stretched into the mountains wreathed with cold and misty rain.

It is likely that permanent settlements were concentrated at the inland edge of the Mānā Plain, where houses, temples, and agricultural complexes were built in the foothills at the base of the cliffs, on high ground overlooking the wetlands and coastline.

Small fishing communities, possibly limited to temporary camps, were scattered along the coast, concentrating near optimal localities such as breaks in the reef where canoes could be launched or where reefs provided rich habitat for near-shore marine resources. Some camps were located on the protected, lee sides of the high dunes from Nohili Point to Polihale. Bennett (1931:102) observed house sites marked “by single rows of stones … or by low walls” along the inland side of the dunes. Flores and Kaohi (1992:44) suggest that the sites on the inland side of the high dunes may have been permanent homes for:

> … Those families whose time was mostly occupied with fishing … [The dunes] provided them protection from ocean storm waves, flood waters, and strong on-shore winds—yet, still close enough to easily access the ocean resources. Taro was cultivated in portions of Kolo Swamp that were adjacent and mauka of these house sites.

2.2.2 Resource Collection and Subsistence

The people of Mānā were noted as fishermen, taking advantage of the rich waters of the channel between Kauaʻi and Niʻihau. Fishing was not confined to the ocean and shoreline of Mānā, but also included the swamps and ponds on the coastal plain. The swamp areas of Limaloa, Kawaiele, Nohili, and Kolo were utilized as brackish water loko puʻuone fishponds (Kikuchi 1987:5, 9; Kilauano 1991).

Although their modern forms are clearly related to the plantation era, the Nohili Ditch and the Kawaiele Ditch may have had earlier iterations as traditional Hawaiian ditches related to the functioning of the inland ponds for aquaculture. The Mānā Plain ponds were formed by water accumulating behind the dune berms with the natural ponds enhanced by excavation of channels through the dunes to allow the flow of ocean water into the ponds during high tide (Kikuchi 1987:9). The wetlands were also a place where wild resources could be collected.

Taro, sweet potato, bananas, and other food crops were also grown in and at the mouths of the narrow gulches that fed onto the plain; however, the aridity of the plain limited the amount of farming. Pukui (1983:271) writes of the proverb “Ola i ka ʻai uwahi ʻole o ke kini o Mānā, the inhabitants of Mānā live on food cooked without smoking.” She says that in ancient days, the people of Mānā “did very little poi-making, except in a place like Kolo, where taro was grown” (see also Kilauano 1991). Handy (1940:61) notes that “wet taro has been grown at the northern end of the Mānā swamp, near the Barking Sands.” However, most Mānā people exchanged fish and dryland products (like gourds) with taro producers from other parts of the island. Thus, because “all the taro cooking and poi-making was done elsewhere, the people of Mānā were said to live on ʻsmokeless foodʼ” (Pukui 1983:271).

The coastal plain was a source of natural items that were collected and used for a variety of purposes. These included ‘a‘ali‘i shrubs for firewood, hi‘aloa and other plants for medicine, and makaloa and neki for weaving. The neki and makaloa were used in plaiting mats and other articles, the fashioning of which was called moena makaloa.

2.2.3 Burials

Hawaiians share a special connection to birthplace and homeland. As a consequence, burials were often placed close to households and those that have passed away are still considered to be part of the living family system (Flores and Kāohi 1992: 207). According to the Hawaiian tradition, upon death, the spirit travels to a leaping-off place where it is then assisted in its journey to the next realm by its ‘aumakua (Puku‘i 1972: 40, cited in Flores and Kāohi 1992: 206). Burials form an incredibly important part of the Hawaiian spiritual world and many Hawaiians feel the spirit resides near the physical remains of the bones. When burials are disturbed, the spirit is insulted, resulting in shame and humiliation to the living descendants (Puku‘i 1972: 109 cited in Flores and Kāohi 1992: 206).

The coastal dunes of the Mānā Plain were the burial grounds of ancient Hawaiians. Human skeletal remains have been found in the sands of PMRF Barking Sands, as well as in mixed sandy soils nearly 1 km inland, from the north end of the installation to Waiokapua Bay and Kokole to the south. References to burials in the Nohili area appear in oral traditions and literature (e.g., Fornander 1917).

In addition to burial locations, the spiritual significance of the Mānā Plain is also evidenced by the presence of several important *heiau*, most notably Polihale and ‘Elekuna *heiau.* ‘Elekuna was known as a particularly important and special *heiau* that King Kalakaua and his priests visited many times (Flores and Kāohi 1992: 45). Polihale *heiau* was a site of religious observance where rites associated with departing souls would be carried out. A sacred spring in a nearby cliff was used for purification of those souls making their journeys into the next realm (Flores and Kāohi 1992: 45).

2.2.4 Transportation

There were two primary traditional land routes across the Mānā Plain: one along the shoreline and the other along the base of the cliffs and ridges. Other trails ran inland from the coastal plain to the mountains. People also traveled by canoe, particularly going to and from the valleys of the Nā Pali coast, by launching from beaches with unobstructed reefs and passageways such as at Palaiholani, Keanapuka, Po‘oahonu, Keawanai‘a, and Polihale.

An unusual means of travel in this area is noted in historical accounts that describe the Mānā Plain after heavy flooding from Kona storms. These accounts note that one could travel by canoe from Waimea to Kolo through Mānā swamps and marsh lands. Faye (1981) recalls that “in a low bottomed canoe you could row for miles on this lake.… The canoe would tip over and if you were very short you wouldn’t be able to touch bottom, but if you were taller, you could sort of tread over.”

2.3 Historical Land Use

Historical land uses in this area include agriculture and U.S. military activities.

2.3.1 Agriculture

Early Western explorers were not particularly interested in the Mānā Plain, which was described as a hot and dry place with large sections of marshland (Portlock 1789:170-171; SEARCH 2012). The inhabitants of Mānā largely lived in the traditional ways of their ancestors until the 1848 Māhele, which wrought wide-ranging social changes and provided for private land ownership. Shortly after the Māhele, commercial agricultural practices were brought to the Mānā Plain by leases on crown lands to Archibald Archer and

eventually Valdemar Knudsen, and practices included grazing cattle, harvesting timber, and cultivating crops such as tobacco, coffee, fruit, rice, and sugarcane (Jones 1992:6; Sweeney 1994:10; SEARCH 2012).

As commercial crop cultivation increased, so, too, did the number of agricultural workers. The majority of these agricultural workers came from China, Japan, and the Philippines. With the influx of agricultural workers, the need for workers' housing increased, and according to Smith (1989:4), the first camp for housing agricultural workers dates to 1852. As agricultural production on the Mānā Plain expanded, much of the marshland was filled in or drained to provide more arable land, with increasing amounts of land being converted to sugarcane cultivation. Much of this was operated by the Kekaha Sugar Company, Ltd, which was formed in 1898 by Knudsen and L'Orange and continued operations through the 20th century (SEARCH 2012).

At Kamokalā Ridge, the area developed in the mid-nineteenth century for cattle grazing and ranching as well as commercial sugar and rice plantations. Plantation workers lived in camps throughout Mānā Plain, including between Kamokalā Ridge and PMRF, and railroad lines extended through fields connecting the agricultural goods to the wharf at Waimea. Plantation operations in the area had all closed by 2000 (TEC Inc.–JV 2011a).

2.3.2 U.S. Military

The following section provides a brief historical overview of U.S. Military land use in the three primary survey areas.

2.3.2.1 Barking Sands

One of the first non-agricultural land uses in the study area was an airstrip. This facility was established by the Territory of Hawai'i in 1921 and constructed by 1928 on a portion of the land that would later become PMRF Barking Sands (SEARCH 2012). The landing field at Barking Sands was not intended to be a commercial airport due to its distance from Waimea but was considered a good location as a stopover for transpacific flights. However, the airfield was seldom used and poorly maintained. Figure 5 shows the location of the landing field in 1935.

In 1940, the airfield at Barking Sands was designated for military use by the U.S. Army (SEARCH 2012). The airfield was expanded by 2,058 ac (832.8 ha) in 1941, quadrupling in size. Figure 5 shows the location of the landing field in 1935 and Figure 6 shows the airfield in 1941, before U.S. involvement in World War II (WWII). The massive land acquisition occurred primarily to the north and south of the existing airstrip along the coast. In May 1942, following the Pearl Harbor attack, the airfield became Barking Sands Army Air Base (TEC Inc.–JV 2011a). Figure 7 shows the landing field in 1943 after the expansion and improvements were completed. After its establishment as an Air Base, Barking Sands was used for flight training and aircraft refueling as the U.S. became involved in WWII (SEARCH 2012). In 1943, Kamokalā Ridge underwent construction, and 10 tunnel magazines with monorail transportation were built for bomb storage. As World War II progressed, Barking Sands was designated as a Combat Crew Replacement Center in 1944, establishing the base as an aircraft maintenance center and training grounds for crew prior to deployment to the Pacific Theater (SEARCH 2012). After World War II ended in 1945, base activity gradually decreased.

The late 1940s saw a decline in military activities as Barking Sands was transferred from the Army to the U.S. Air Force, becoming Barking Sands Air Force Base in 1948 (SEARCH 2012). The U.S. Navy established PMRF at the airfield in 1958 after using the area in 1956 for training operations on Regulus guided missiles, the first major Cold War mission at Barking Sands. The Atomic Energy Commission was a major tenant on base and created the Kauai Test Facility in the early 1960s, operated by Sandia

National Laboratories. Mākaha Ridge, a northern outpost near Waimea Canyon, was developed by the Navy in 1966 to aid the new Barking Sands Tactical Underwater Range and to house radar and telemetry facilities (SEARCH 2012).

Figure 5 Barking Sands Landing Field in 1935. Source: National Archives.

Figure 6 Barking Sands Army Air Base in 1941. Source: National Archives.

Figure 7 Barking Sands Army Air Base in 1943. Source: National Archives.

2.3.2.1 Kamokalā Ridge

The naval facilities at Kamokalā Ridge were developed in 1942-43, shortly after the attack on Pearl Harbor (SEARCH 2012). As PMRF Barking Sands was expanded to include strategic offensive facilities to provide service, equipment, and maintenance for B-24 bombers heading into the Pacific, several critical facilities were built underground to provide greater protection from aerial attacks. It was during this initial construction phase that the Kamokalā Ridge magazines were dug out of its basalt cliffs, some with monorails to transport munitions (TEC Inc.–JV 2011a) in 1943 (see Figure 8 and Figure 9). Records also indicate that during the 1960s, the Navy stored High Altitude Sounding Projectile (HASP) boosters in the hard-rock magazines at Kamokalā Ridge as part of Cold War missions at PMRF (SEARCH 2012). Between 1966 and 1992, the Hawaii Air National Guard occupied portions of PMRF and, during this period, acquired one of the 10 hard-rock magazines to use for storage of weapons and ordinance. Two large, earth-covered missile magazines were constructed at Kamokalā Ridge in 2002 (TEC Inc.–JV 2011a).

Known extant historic-era built resources within Kamokalā Ridge include 10 National Register of Historic Places-eligible tunnel magazines (Facilities 1-10) (SEARCH 2012). Kamokalā Ridge is accessed via the Ordnance Gate of Barking Sands and Kamokalā Ridge Road, which follows its original 1942 alignment and includes an extant vehicular bridge (Facility 20) (TEC Inc.–JV 2011a).

2.3.2.2 Mākaha Ridge

Mākaha Ridge was formally developed by the Navy in 1966 to aid the new Barking Sands Tactical Underwater Range and to house radar and telemetry facilities (SEARCH 2012). Construction at Mākaha

Ridge was a large undertaking and required extensive development of the landscape, including the installation of access roads (Weitze 2008). The site is accessed by the Mākaha Ridge Access Road, which is a long, narrow, paved road located in the forested lands stemming from Kōke‘e Road to the southeast (TEC Inc. 2011a).

Prior to the Cold War, one facility existed at Mākaha Ridge, The Command Control Transmit Van Site (Building 200531) was constructed in 1946. Facilities built during the Cold War on Mākaha Ridge included a communications facility (Building 708), power station (Building 711), tracking radar (Building 713), and surveillance radar (Building 715) (Weitze 2008). A filling station (Building 733) was added in 1960. A helicopter pad was installed on the western portion of the Mākaha Ridge site sometime after 1966.

Several additional facilities were added between 1967 and 1970, including a telemetry facility (Building 725) and three telemetry towers (Buildings 726, 727, and 728) (see Figure 10 and Figure 11) (Weitze 2008, SEARCH 2012). An electric and communication maintenance shop (Building 742) was added to Mākaha Ridge in 1983. Mākaha Ridge, in combination with the Barking Sands Tactical Underwater Range and PMRF launch complex, comprised a National Missile Range and an underwater range (TEC Inc. 2011a). These ranges were used to train personnel in nuclear submarines operations and anti-submarine warfare during the Cold War era, and Mākaha Ridge supported naval weapons tests and evaluations during Navy fleet exercises (SEARCH 2012). Prior historic building surveys conducted at Mākaha Ridge include Dowden and Rosendahl in 1993, Drolet et al. in 1996, and Maly and Wulzen in 1997.

Figure 8 Example of Kamokalā Ridge missile magazine. Source: Tomonari-Tuggle and Yoklavich (2005).

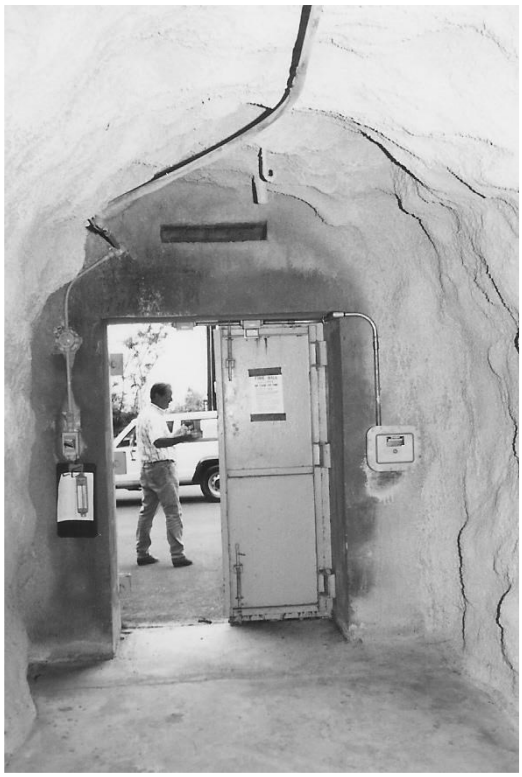

Figure 9 Example of Kamokalā Ridge missile magazine. Source: Tomonari-Tuggle and Yoklavich (2005).

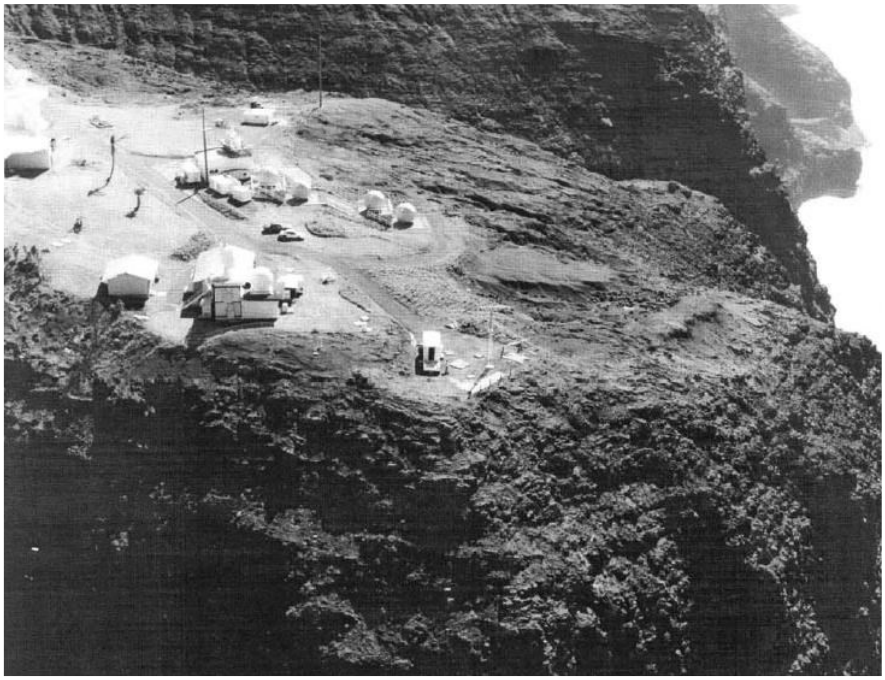

Figure 10 Mākaha Ridge Tracking Station in the 1960s. Courtesy of PMRF.

Figure 11 Mākaha Ridge Tracking Station with Mākaha Ridge Road in the background. Courtesy of PMRF.

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Appendix B
Regulatory Setting

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Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
County of Kaua‘i	Kaua‘i Kakou – Kaua‘i County General Plan	The Kaua‘i General Plan serves as the county’s guiding policy framework concerning growth, land use, and development issues. The plan seeks to enhance and improve Kaua‘i’s physical and natural environment and overall quality of life. The plan is built upon a countywide vision and goals statement and sets forth key objectives and actions. The General Plan underwent a comprehensive update in 2018. Although the development plan does not apply to projects on federal property, protection of mountain and ocean views that benefit the visual quality of the ROI should be considered.	Visual Resources and Land Use	This EIS was developed in accordance with the guidance in this plan.
County of Kaua‘i Transportation Agency – The Kaua‘i Bus	County of Kaua‘i Transportation Agency standards for public transit operation (physical and operational) and DTS Roadway and Traffic Operations Guidelines	County of Kaua‘i Transportation Agency operates the Kaua‘i Bus, the public transit system that provides service to PMRF.	Traffic	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
CEQ; Navy	NEPA; CEQ NEPA implementing regulations; Navy procedures for implementing NEPA (42 U.S.C. § 4331; 40 CFR parts 1500-1508; 32 CFR part 775)	Regulations applicable to and binding on all federal agencies for implementing the procedural provisions of NEPA.	All Resources	This EIS has been prepared in accordance with the President’s revised CEQ Regulations implementing NEPA and Navy NEPA procedures effective for actions initiated after September 14, 2020. Preparation of this EIS and provisions for its public review are being conducted in compliance with NEPA.
CEQ	NEPA 40 CFR § 1502.16(a)(10)	States that environmental consequences should include “economic and technical considerations, including the economic benefits of the proposed action,” where applicable.	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS evaluates economic benefits of the Proposed Action.
CEQ	NEPA 40 CFR § 1508.1(g)(1)	States that effects include “aesthetic, historic, cultural, economic (such as the effects on employment), social, or health” effects.	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS evaluates how elements of the human environment such as population, employment, housing, economic activity, and local government revenue might be affected by the Proposed Action.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
CEQ	NEPA 40 CFR § 1508.1(m)	States that the human environment means "comprehensively the natural and physical environment and the relationship of present and future generations of Americans with that environment."	Socioeconomics	Following these regulations, the socioeconomic analysis in this EIS uses this definition for the human environment.
CEQ	Environmental Justice Guidance Under the National Environmental Policy Act	Guidance document to assist federal agencies with their NEPA procedures so that environmental justice concerns are effectively identified and addressed in accordance with EO 12898.	Environmental Justice and Protection of Children	This EIS was developed in accordance with this guidance.
CEQ	Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews	Guidance to assist federal agencies in their consideration of the effects of GHG emissions and climate change when evaluating proposed federal actions in accordance with NEPA.	All Resources	This EIS was developed in accordance with this guidance.
CEQ	Fiscal Responsibility Act of 2023, PL 118-5	Amendments to NEPA	All Resources	This law was used to determine the joint status of NASA and Navy for the preparation of this EIS.
CEQ and Office of Science and Technology Policy	EO 13840 Ocean Policy to Advance the Economic, Security, and Environmental Interest of the U.S.	Ensure protection, maintenance, and restoration of the health of the ocean.	Water Resources; Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
CNRH	IAP	The IAP is a guidance document that provides aesthetic and functional direction in site design, architecture, landscape architecture, and signage for new development and renovation efforts. The IAP helps to protect and preserve the installation's natural and historic integrity and ensures a unified appearance for each installation and continuity across the region.	Visual Resources	This EIS was developed in accordance with the guidance in this plan.
DLNR-SHPD	Hawai'i Revised Statutes 6E-42	Project requires compliance with state laws for preservation of historic properties.	Cultural Resources	Compliance with this law will be conducted.
DoD	DoD Inst. 4715.06 – Environmental Compliance in the United States	Establishes policies, assigns responsibilities, and provides procedures for achieving and maintaining environmental compliance in the U.S.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
DoD	DoD Inst. 6050.05 – DoD Hazard Communication Program	Manages hazardous substances to minimize health and environmental risks and operational costs. Provides known hazard information to military personnel and civilian employees using hazardous chemicals, including engineered nanomaterials.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	NAVSUP Pub. 573 (DLA Instruction 4145.11) – Storage and Handling of Hazardous Materials	Procedures for the receipt, storage, and handling of hazardous materials and wastes by DoD components, installation, and activities.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Defense Explosives Safety Regulation 6055.09	Establishes explosives safety standards for the DoD that are designed to manage explosives related risk associated with DoD operations and installations by providing protection criteria.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	DoD Directive 4710.03, Consultation with Native Hawaiian Organizations (October 25, 2011, incorporating Change 1, August 31, 2018)	Provides policy, prescribes procedures, and assigns responsibilities for the management of archaeological and historic resources located in and on waters and lands under DoD control. It is the policy of DoD to integrate historic preservation requirements with the planning and management of activities under DoD control.	Cultural Resources	Consultation with NHOs, if required for compliance with NHPA according to the Programmatic Agreement, would be conducted in accordance with this directive.
DoD	Danger Zone and Restricted Area Regulations (33 CFR part 334)	Hazardous materials and wastes exposure, including MEC.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Final Military Munitions Rule (40 CFR part 266, Subpart M)	Hazardous materials and waste exposure, including MEC.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
DoD	Naval Ordinance Safety and Security Activity Instruction 8020.15E. Explosives Safety Review, Oversight, and Verification of Munitions Responses	Munition exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA; DoD	CWA (33 U.S.C. §§ 1313, 1314, 303(d), 305(b) and most recent 304(a) list)	Mitigates impacts to surface water from construction activities and discharge to navigable waters.	Hazardous Materials and Wastes; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA; HDOH-CWB	CWA section 402, NPDES Program (42 U.S.C. § 7401 et seq.); Hawaiʻi Water Quality Standards (HAR 11- 55; HRS Chapter 342D) *includes NPDES and SWPPP	Regulates discharges of pollutants from point source to WOTUS and requires compliance with standards, limitations, and regulations. NPDES permits authorized discharges of stormwater associated with construction and industrial activities.	Hazardous Materials and Wastes; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA; HDOH-CWB	CWA section 401 (33 U.S.C. § 1341; 40 CFR §§ 121.2(a)(3), (4), and (5) Water Quality Certification); Hawaiʻi Water Quality Standards (HAR 11- 54; HRS Chapter 342D)	Any federally authorized activity that may result in any discharge into state waters requires a Water Quality Certification. Water pollutants that enter state waters from all sources, point or non-point, shall comply with applicable requirements as established in HAR, Chapter 11-54.	Marine Biological Resources; Water Resources; Public Health and Safety; Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	Title 40 CFR et seq.: Protection of the Environment	EPA protects human health and the environment.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	40 CFR § 125.94	Compliance with BTA Standards.	Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	National Primary Drinking Water Regulations 40 CFR part 141	Affects management of water sources by way of setting standards for drinking water quality. Groundwater quality and quantity are regulated under several statutes and regulations, including the Safe Drinking Water Act.	Water Resources; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Energy Independence and Security Act; PL 110-140 section 438	Federal agencies are required to reduce stormwater runoff from federal development and redevelopment projects to protect water resources.	Water Resources; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA	RCRA 42 U.S.C. § 6901 et seq. and 40 CFR parts 260-272 as relates to hazardous waste management	Hazardous materials and wastes exposure. The EPA controls hazardous waste including generation, transportation, treatment, storage, and disposal of hazardous waste.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	Toxic Substances and Disease Registry – CERCLA 42 U.S.C. §§ 9601–9675; 40 CFR parts 300–311; 40 CFR part 373	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	Pollution Prevention Act of 1990 (42 U.S.C. §§ 13101–13109)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Emergency Planning and Community Right-to-Know Act of 1986 (42 U.S.C. § 11001 et seq.; 40 CFR parts 350–372)	Hazardous materials and wastes exposure. Helps communities plan for chemical emergencies and requires industry to report on the storage, use, and releases of hazardous substances to federal, state, and local government.	Hazardous Materials and Wastes; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act.
EPA	EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	Health and safety of children (vulnerable population).	Public Health and Safety; Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts to children.
EPA	Federal Insecticide, Fungicide, and Rodenticide Act of 1996 (7 U.S.C. § 136 et seq.)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Federal Environmental Pesticide Control Act of 1972 (7 U.S.C. §§ 136–136y)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
EPA	Federal Facilities Compliance Act of 1992 (PL 102–386)	Hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
EPA	Noise Control Act of 1972 (PL 92- 574, 42 U.S.C. § 4901 et seq.) and Amendments of 1978 (PL 95-609)	Establishes a national policy to promote an environment for all Americans free from noise that jeopardizes their health and welfare.	Noise; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in compliance with this Act.
EPA	40 CFR part 50	NAAQS.	Air Quality	The Proposed Action would not cause a violation of the NAAQS.
EPA	40 CFR part 60	New Source Performance Standards.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	40 CFR parts 61-63	NESHAPs.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.
EPA	40 CFR part 70	State Operating Permits.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
EPA	Memorandum addressing Children's Health through Reviews Conducted Pursuant to the NEPA and section 309 of the Clean Air Act	Memorandum on addressing the Protection of Children from environmental health risks and safety risks in NEPA and section 309 Clean Air Act Reviews in accordance with EO 13045.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts to children.
Federal Law	National Historic Preservation Act (NHPA), as amended (54 U.S.C. 300101 et seq.).	Establishes national policy for the preservation of historic properties. Section 106 of the NHPA requires federal agencies to consider the effects of proposed undertakings, mitigate adverse effects of projects, and afford the ACHP and interested parties the opportunity to comment.	Cultural Resources	Compliance with the NHPA will be conducted according to the 2012 COMNAVREG Hawaii Programmatic Agreement and any applicable amendments.
Federal Law	Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. §§ 3001-3013).	Provides for the protection and repatriation of Native American and Native Hawaiian human remains and cultural items discovered on federal or tribal lands or currently curated by federal or federally assisted curation facilities.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.
Federal Law	Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-470ll).	Provides for the protection of archaeological resources and sites on public and Indian lands by requiring permits from the federal land manager for excavation or removal of archaeological resources.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Federal Law	American Indian Religious Freedom Act of 1978 (42 U.S.C. § 1966)	Establishes the policy of the United States to protect and preserve the rights of American Indians, Eskimos, Aleuts, and Native Hawaiians to believe, express, and exercise their traditional religions.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this law and its implementing regulation.
FEMA	Floodplain Management, EO 11988	Requires federal agencies to avoid long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct and indirect support of floodplain development. Flood potential of a site is usually determined by the 100-year floodplain, which is defined as the area that has a 1 percent chance of inundation by a flood event in a given year.	Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
HDOH	CWA section 401 (33 U.S.C. § 1341, 40 CFR §§ 121.2(a)(3), (4), and (5) Water Quality Certification); Water Pollution Control Act (33 U.S.C. § 1251 et seq.)	Any federally authorized activity that may result in a discharge into state waters requires a Water Quality Certification. Potential impacts from the Proposed Action through impacts on water quality. The Kawaiʻele Pumping Station as well as Canal discharge may fall under these regulations.	Marine Biological Resources; Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	22 HAR Title 11, Chapter 59	State AAQS.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	22 HAR Title 11, Chapter 60.1	Air Pollution Control.	Air Quality	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	Hawaiʻi Underground Storage Tanks Act HAR 19-342L	Regulations pertaining to underground storage tanks, which includes hazardous substances release.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOH	Solid Waste Management Control HAR 11-58	Establishes minimum standards governing design, construction, installation, operation, and maintenance of solid waste disposal, recycling, reclamation, and transfer systems.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
HDOT	HDOT traffic operational and safety standards and HDOT roadway design standards	Regional and sub-regional roadways providing access to PMRF are under the jurisdiction of HDOT, specifically Kuhio Highway.	Traffic	The Proposed Action analyzed in this EIS would be implemented in accordance with these standards.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
NASA	NASA's Procedures for Implementing NEPA, 14 CFR part 1216, et seq.	Regulations governing NASA's compliance with NEPA and CEQ's 40 CFR parts 1500–1508.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
NASA	NASA Environmental Management, NPD 8500.1	NASA's environmental management policy	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these policies.
NASA	NASA National Environmental Policy Act Management Requirements, NPR 8580.1	Establishes procedures and responsibilities for complying with requirements of NEPA, CEQ's implementing regulations, EO 12114 – Environmental Effects Abroad of Major Federal Actions, and NPD 8500.1.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
Navy	PMRF Installation Development Plan	Land use constraints.	Land Use	This EIS was developed in accordance with the guidance in this plan.
Navy	OPNAVINST 11010.40	Establishes an encroachment management program to ensure operational maintenance that has direct bearing on land use planning on installations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 11010.36C	Provides guidance administering the AICUZ program, which recommends land uses that are compatible with noise levels, accident potential, and obstruction clearance criteria for military airfield operations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 3550.1A	Provides guidance for the RAICUZ program. This program includes range safety and noise analyses and provides land use recommendations that are compatible with Range Compatibility Zones and noise levels associated with military range operations.	Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	OPNAVINST 5090.1 Environmental Readiness	Provides guidance for the management of the environmental, natural, and cultural resources for all Navy ships and shore activities.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	Environmental Readiness Program Manual (OPNAV-M 5090.1)	Navy's policy guidance for environmental readiness. It discusses requirements, delineates responsibilities, and issues policy guidance for the management of the environmental, natural and cultural resources for all Navy ships and shore activities.	All Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this manual.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Navy	SECNAVINST 4000.35B Department of the Navy Cultural Resource Program	Provides clarification on the responsibilities for management of historic buildings, structures, districts, archaeological sites and artifacts, historic ships and aircraft, and other cultural resources.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
Navy	SECNAVINST 11010.14B Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes, Alaska Native Tribal Entities, and Native Hawaiian Organizations	Provides policy, procedures, and responsibilities when consulting with representatives of federally recognized Indian tribes, including Native Hawaiian Organizations.	Cultural Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with these guidelines.
NAVFAC	PW6 600-01, Public Works Utilities Criteria for Design and Construction of Electrical, Sewer, and Water, April 10, 2006	Utilities design criteria.	Utilities	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
NAVFAC	PW6 600-01 Public Works Utility Criteria for Design and Construction of Water Utilities	Utilities design criteria.	Utilities	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
NOAA; SOH, Office of Planning and Sustainable Development	National Coastal Zone Management Act (16 U.S.C. § 1451, 15 CFR part 930); Coastal Zone Management Act section 307(c)(1), HRS Chapter 205A – Coastal Zone Management	Federal actions or activities that affect any land or water use or natural resource of the coastal zone are to be carried out in a manner consistent to the maximum extent practicable with the enforceable policies of federally approved state coastal management program.	Hazardous Materials and Wastes; Land Use; Water Resources; Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act to the extent practicable, consistent with the enforceable policies of Hawai‘i’s federally approved coastal management program.
NOAA NMFS; USFWS; SOH, DLNR	ESA (16 U.S.C. § 1531 et seq.); State of Hawai‘i Endangered Species Laws (HAR 12-124, Exhibit 2 and HRS § 195D)	Potential impacts to federally and state listed species.	Terrestrial Biological Resources; Marine Biological Resources; Land Use	Informal consultation with NMFS and USFWS has been initiated and is ongoing, and the Proposed Action analyzed in this EIS would be implemented in compliance with the ESA. Potential impacts to state-listed species are addressed in this EIS. This is pending review of monk seal haul-out in the leasehold area; additional review of ESA species is covered in the Hawaii-Southern California Training and Testing EIS.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
NOAA NMFS; SOH, DLNR; EPA	EO 13089, Coral Reef Protection	All federal agencies whose actions may affect U.S. coral reef ecosystems shall: (a) identify their actions that may affect U.S. coral reef ecosystems; (b) utilize their programs and authorities to protect and enhance the conditions of such ecosystems; and (c) to the extent permitted by law, ensure that any actions they authorize, fund, or carry out will not degrade the conditions of such ecosystems.	Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
NOAA NMFS; HDOH	EO 12088, Federal Compliance with Pollution Control Standards	Ensures federal compliance with applicable pollution control standards. Related to impacts from sediment resuspension and runoff due to operations.	Marine Biological Resources; Water Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
NOAA NMFS	Section 305 of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.)	EFH is not expected but could be designated in the study area.	Marine Biological Resources	The project is within areas designated as EFH; therefore, the Navy will provide NMFS with a written assessment of the effects of the Proposed Action on EFH. This analysis is covered in the Hawaii-Southern California Training and Testing EIS.
NOAA NMFS	Marine Mammal Protection Act (16 U.S.C. § 1361-1407)	Presence of one marine mammal, Hawaiian monk seal (*Neomonachus schauinslandi*), which is known to appear in study area.	Marine Biological Resources	Informal consultation with NMFS has been initiated under the ESA.
OSHA	Occupational Safety and Health Act of 1970 (PL 91-596); OSHA Occupational Noise Exposure (29 CFR § 1910.95)	Workforce safety, including occupational noise exposure limits.	Public Health and Safety; Noise	The Proposed Action analyzed in this EIS would be implemented in accordance with these requirements.
Office of the President	EO 11990, Protection of Wetlands (42 FR 26961, May 24, 1977)	Requires federal agencies to adopt a policy to avoid long- and short-term adverse impacts associated with destruction and modification of wetlands and to avoid the direct and indirect support of new construction in wetlands whenever there is a practicable alternative.	Water Resources; Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
Office of the President	EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations (59 FR 7629; February 16, 1994)	Requires agencies to identify and address any disproportionately high and adverse human health or environmental effects their programs, policies, and activities may have on minority populations and low-income populations.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts on low income populations, minority populations, or the Native Hawaiian population.
Office of the President	EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885; April 23, 1997)	Requires agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that their policies, programs, activities, and standards address those disproportionate risks.	Environmental Justice and Protection of Children; Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
Office of the President	EO 13112, Invasive Species (64 FR 6183; February 3, 1999)	Requires federal agencies whose actions may affect the status of invasive species to identify those actions and use relevant programs and authorities to prevent and manage the introduction of invasive species in consultation with the Invasive Species Council.	Terrestrial Biological Resources; Marine Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.
Office of the President	EO 14008, On Tackling the Climate Crisis at Home and Abroad (86 FR 7619; January 27, 2021)	Amends EO 12898 by updating the interagency working group and requiring the working group to report back with recommendations to improve environmental justice.	Environmental Justice and Protection of Children	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order. The EIS includes an analysis to determine if federal actions would have disproportionate human health or environmental impacts on low income populations, minority populations, or the Native Hawaiian population.
State of Hawaiʻi - Office of Planning and Sustainable Development (OPSD)	Coastal Zone Management Act Section 307/CZM Program	The national Coastal Zone Management Act (CZMA), Section 307, requires federal agency activities and development projects affecting any coastal use or resource to be undertaken in a manner consistent to the maximum extent practicable with the state's CZM program. The CZM area encompasses the entire state because there is no point of land more than 30 miles from the ocean, a definite land-sea connection exists throughout the state. The project exists within the CZM area.	All Resources	A CZM federal consistency review and application will be completed and submitted to the State of Hawaiʻi CZM program office.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
State of Hawaiʻi – Department of Land and Natural Resources (DLNR)	Hawaiʻi Revised Statutes Chapter 343 commonly referred to as The Hawaiʻi Environmental Policy Act ("HEPA"). The trigger for compliance is the use of state lands.	The State of Hawaiʻi Department of Land and Natural Resources will be the accepting agency for the EIS document for Hawaiʻi Revised Statutes Chapter 343.	All Resources	This EIS was developed in accordance with the Hawaiʻi Revised Statutes Chapter 343
SOH	Hawaiʻi Administrative Code Title 19, 342F Noise Pollution	Describes environmental noise levels appropriate for noise sensitive land uses.	Noise	The Navy will consider state regulations for noise-sensitive land uses. Sources of noise and the associated sensitive receptors in the human environment are analyzed in this EIS.
USDA, NRCS	Farmland Protection Policy Act (7 U.S.C. §§ 4201-4209 7)	Requires federal agencies to evaluate the adverse effects of their activities on farmland, which includes prime and unique farmland and farmland of statewide or local importance, and to consider alternative actions that could avoid adverse effects.	Geological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act. The EIS includes an analysis to determine if federal actions would have adverse effects on farmland, which includes prime and unique farmland and farmland of statewide or local importance.
USDOT	49 CFR §§ 171.1-172.558	Regulates and ensures the safe and secure movement of hazardous materials to industry and consumers by all modes of transportation, including pipelines.	Hazardous Materials and Wastes	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
USDOT	USDOT Hazardous Materials Ground Transport Regulations/Hazardous Materials Transportation Act (49 CFR parts 100–185)	Transportation safety; hazardous materials and waste exposure.	Public Health and Safety	The Proposed Action analyzed in this EIS would be implemented in accordance with these regulations.
USFWS	Migratory Bird Treaty Act of 1918 (16 U.S.C. §§ 703–712)	Potential impacts to bird species protected by the Act.	Terrestrial Biological Resources; Land Use	The Proposed Action analyzed in this EIS would be implemented in accordance with this Act.

Agency	Federal, State, Local, and Regional Laws; Land Use Plans; Policies; Controls; and Guidance	Relevance to the Proposed Action	Relevant Resources	Status of Compliance
USFWS	EO 13186: Responsibilities of Federal Agencies to Protect Migratory Birds	Potential impacts to migratory birds.	Terrestrial Biological Resources	The Proposed Action analyzed in this EIS would be implemented in accordance with this Order.

Key: § = section(s); AAQS = ambient air quality standards; ACHP = Advisory Council on Historic Preservation; AICUZ = Air Installation Compatible Use Zone; BTA = Best Technology Available; CEQ = Council on Environmental Quality; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CNRH = Commander Navy Region Hawaii; CWA = Clean Water Act; CWB = Clean Water Branch; DLA = Defense Logistics Agency; DLNR = Department of Land and Natural Resources; DoD = Department of Defense; DTS = Department of Transportation Services; ECF = entry control facility; EFH = Essential Fish Habitat; EIS = Environmental Impact Statement; EO = Executive Order; EPA = U.S. Environmental Protection Agency; ESA = Endangered Species Act; FEMA = Federal Emergency Management Agency; FR = Federal Register; GHG = greenhouse gas; HAR = Hawaiʻi Administrative Rules; HDOH = Hawaiʻi Department of Health; HDOT = Hawaiʻi Department of Transportation; HRS = Hawaiʻi Revised Statutes; IAP = Installation Appearance Plan; Inst. = Instruction; MEC = munitions and explosives of concern; Navy = U.S. Department of the Navy; NAAQS = National Ambient Air Quality Standards; NAVFAC = Naval Facilities Engineering Systems Command; NAVSUP = Naval Supply Systems Command; NEPA = National Environmental Policy Act; NESHAP = National Emission Standards for Hazardous Air Pollutant; NHPA = National Historic Preservation Act; NMFS = National Marine Fisheries Service; NOAA = National Oceanic and Atmospheric Administration; NPD = NASA Policy Directive; NPDES = National Pollutant Discharge Elimination System; NPR = NASA Procedural Requirement; NRCS = Natural Resources Conservation Service; OPNAVINST = Office of the Chief of Naval Operations Instruction; OSHA = Occupational Safety and Health Administration; PL = Public Law; Pub. = Publication; RAICUZ = Range Air Installation Compatible Use Zone; RCRA = Resource Conservation and Recovery Act; ROI = region of influence; SECNAVINST = Secretary of the Navy Instructions; SHPD = State Historic Preservation Division; SOH = State of Hawaiʻi; SWPPP = Stormwater Pollution Prevention Plan; U.S.C. = United States Code; USDA = U.S. Department of Agriculture; USCG = U.S. Coast Guard; USDOT = U.S. Department of Transportation; USFWS = U.S. Fish and Wildlife Service; WOTUS = Waters of the U.S.

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Appendix C
List of Interested Parties Contacted During Scoping

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Category	Group
Federal, state, and local elected officials	• Federal Elected Officials ▪ U.S. Senators o Mazie K. Hirono o Brian Schatz • U.S. House of Representatives ▪ Congressional District I: Ed Case ▪ Congressional District II: Jill N. Tokuda • State Elected Officials ▪ Governor: Josh Green ▪ Lieutenant Governor: Sylvia Luke ▪ Attorney General: Anne E. Lopez ▪ State Senate o District 8: Ronald D. Kouchi • State Assembly ▪ House District 15: Nadine K. Nakamura ▪ House District 16: Luke A. Evslin ▪ House District 17: Dee Morikawa ▪ Senate Committees o Public Safety and Intergovernmental Affairs and Military o Water and Land o Ways and Means ▪ House Committees o Corrections, Military and Veterans o Water and Land o Finance • Local Elected Officials ▪ County of Kaua‘i o Mayor Derek S.K. Kawakami ▪ County Council o Mel Rapozo (Council Chair) o KipuKai Kuali‘i (Council Vice Chair) o Addison Bulosan (Councilmember) o Bernard P. Carvalho, Jr. (Councilmember) o Felicia Cowden (Councilmember) o Bill DeCosta (Councilmember) o Ross Kagawa (Councilmember)
Federal, state, and local regulatory and non-regulatory government agencies	• Federal Agencies ▪ Advisory Council on Historic Preservation ▪ National Oceanic and Atmospheric Administration Fisheries ▪ U.S. Army Corps of Engineers Honolulu District ▪ U.S. Coast Guard District 14 ▪ U.S. Department of the Interior, Office of Hawaiian Relations ▪ U.S. Environmental Protection Agency ▪ USFWS, Kilauea Point National Wildlife Refuge ▪ USFWS, Pacific Islands Fish and Wildlife Office ▪ USDA Forest Service, Institute of Pacific Islands Forestry ▪ USDA, Hawai‘i and Western Pacific State Office ▪ U.S. Geological Survey, Honolulu Field Station ▪ National Park Service

Category	Group

	• State Agencies
	  ▪ Department of Agriculture
	  ▪ Agribusiness Development Corporation
	  ▪ DLNR
	  ▪ DLNR BLNR
	  ▪ DLNR DOFAW
	  ▪ DLNR Land Division (Kaua‘i District)
	  ▪ DLNR OCCL (Conservation District)
	  ▪ DLNR-SHPD
	  ▪ DLNR Division of State Parks
	  ▪ DLNR Commission on Water Resource Management
	  ▪ Department of Transportation
	  ▪ OHA
	  ▪ OHA, Kaua‘i Burial Council
	  ▪ Department of Health, Clean Water Branch
	  ▪ OPSD
	  ▪ OPSD, Environmental Review Program
	  ▪ OPSD, CZM Program
	  ▪ Department of Business, Economic Development and Tourism
	  ▪ Department of Hawaiian Homelands
	  ▪ Department of the Attorney General
	  ▪ Department of Defense (State of Hawai‘i)
	  ▪ Boards and Commissions
	  ▪ Kaua‘i Circuit Court
	  ▪ Kaua‘i District Office, Division of State Parks
	  ▪ Hawai‘i State Parks
	• Regional/Local Agencies
	  ▪ County of Kaua‘i Departments:
	  o Parks and Recreation
	  o Water
	  o Kaua‘i Emergency Management Agency
	  o Fire
	  o Police
	  o Economic Development
	  o Planning
	  o Public Works
	  o Transportation
	  o County of Kaua‘i Office of Boards and Commissions
	  ▪ University of Hawai‘i System
	  o Kaua‘i Community College
	  o Kaua‘i Agricultural Research Center
	  o Pacific Cooperative Studies Unit
	  ▪ Native Hawaiian Federal Interagency Working Group, current members include:
	  o Advisory Council on Historic Preservation
	  o Office of the Deputy Under Secretary of Defense for Installations and Environment
	  o Small Business Administration
	  o Office of Native Hawaiian Relations

Category	Group
Native Hawaii Organizations	• ʻĀina Momona (State of Hawaiʻi) • Association of Hawaiian Civic Clubs (State of Hawaiʻi) • Hawaiian Native Corporation (supports NHOs – State of Hawaiʻi) • Koʻolau Foundation (State of Hawaiʻi) • Native Hawaiian Hospitality Association (State of Hawaiʻi) • Kawaileo Law A Limited Liability Law Company (State of Hawaiʻi) • Council For Native Hawaiian Advancement (State of Hawaiʻi) • Na Koa Ikaika Ka Lahui Hawaiʻi (Kauaʻi) • Na ʻOhana Papa O Manā (Kauaʻi) • EAO Hawaiʻi Inc. (Kauaʻi) • Nā Kuleana o Kānaka ʻŌiwi (Kauaʻi) • Hanalei River Heritage Foundation (Kauaʻi) • ALU LIKE, Inc. (Kauaʻi) • Kauaʻi Kupuna Council • Kauaʻi Burial Council
Community planning groups, and other community and civic organizations	• Community Planning Groups ▪ Kauaʻi Planning & Action Alliance • Community Organizations ▪ Hui Makaʻāinana O Makana ▪ Waipā Foundation ▪ Waimea Community Association • DON Advocacy Groups ▪ AMVETS Department of Hawaiʻi • Civic Groups ▪ Kauaʻi Planning & Action Alliance ▪ Hawaiʻi Community Foundation ▪ Kilauea Community Agricultural Center - Aina Hoʻokupu O Kilauea ▪ Kauaʻi Philippine Cultural Center ▪ Ke Kumu O Hihinui Cultural Center ▪ Kauaʻi Museum ▪ Kōkeʻe Natural History Museum
Small business associations, economic development/ tourism organization, and recreational and real estate interests	• Economic Development Organizations ▪ Kauaʻi Chamber ▪ Kauaʻi Filipino Chamber of Commerce • Tourism ▪ Camp Sloggett ▪ Waimea Japanese Cemetery ▪ Kauaʻi Visitors Bureau (Sue Kanoho) ▪ Smith Family Garden Luau ▪ Kōkeʻe Lodge ▪ The Cabins at Kōkeʻe
Local environmental organizations and other Non-Governmental Organizations	• Government Programs ▪ DLNR DOFAW Natural Area Reserves System ▪ Kauaʻi Seabird Habitat Conservation Plan • Environmental Organizations – Local ▪ National Tropical Botanical Gardens, Plant Extinction Prevention Program

Category	Group
	▪ Kaua‘i Forest Bird Recovery Project ▪ Kaua‘i Watershed Alliance ▪ Hanalei Watershed Hui ▪ Kaua‘i North Shore Community Foundation ▪ North Shore Community Land Trust ▪ Kaua‘i Invasive Species Committee ▪ Kōke‘e Resource Conservation Program ▪ Keahole Defense Coalition • Environmental Organizations – Regional/National ▪ Earthjustice ▪ Surfrider Foundation ▪ Sierra Club – Kaua‘i Chapter ▪ Reef Guardians ▪ Save our Shearwaters ▪ Conservation Council for Hawai‘i ▪ Kahea – The Hawaiian Environmental Alliance ▪ Hawai‘i Audubon Society ▪ Hawaiian Islands Land Trust ▪ Native Hawaiian Plant Society ▪ Hawai‘i Wildlife Center ▪ Nā Kia‘i Kai ▪ Nature Conservancy - Hawai‘i Chapter ▪ Pesticide Action Network North America • Fishing/Diving ▪ Hawai‘i Big Game Fishing Club ▪ Hawai‘i Freshwater Fishing Association • Boating/Yacht Clubs/Marinas ▪ Nawiliwili Yacht Club ▪ Kaua‘i Sailing Association ▪ West Side Boaters Association ▪ Holo Holo Charters ▪ Catamaran Kahanu ▪ Captain Andy’s ▪ Kauai Sea Tours ▪ Napali Odyssey ▪ Makana Charters ▪ Seasport Divers ▪ Nā Pali Riders ▪ Blue Dolphin Charters
Local media outlets	• Print ▪ Kaua‘i Island News ▪ The Garden Island ▪ MidWeek Kaua‘i ▪ The Honolulu Star-Advertiser ▪ Hawai‘i Tribune-Herald ▪ Ka Wai Ola • TV ▪ KITV 4 (ABC) ▪ KHON2 (Fox and CW)

Category	Group
	▪ Hawaiʻi News Now • Radio ▪ Kong Radio 93.5 ▪ KHKU 94.3 FM ▪ KFMN FM 97 ▪ KJMQ Jamz 98.1 ▪ Sunny 101.3 ▪ Hawaiʻi Public Radio (HPR) • Online ▪ Honolulu Civil Beat ▪ Kauaʻi Now ▪ Waimea Theater On-Screen Advertising
Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	• Dennis Eguchi • Pastor Daryl Kua • Alethea Kaohi • Bob Westerman • Toni Ricci • Lyle Tabata • Charlie Iona • Marissa Faye • Josh Mori • Keiko Napier • Kaua Mata • Tia Korete • Terry Lily • Barbara "Makaʻala" Kaʻaumoana
Residents, business, agricultural operations, schools, and property owners near PMRF	• Communities of Kekaha, Waimea, Hanapepe, Eleʻele, Port Allen, Kalaheo, Lawai, Omao, Koloa, Poipu, Kapaʻa, and Līhuʻe • Schools – Kauaʻi District, Waimea Complex ▪ Kekaha Elementary School ▪ Niʻihau High and Elementary School ▪ Waimea High School ▪ Waimea Canyon Middle School ▪ Ke Kula Niʻihau O Kekaha Public Charter School ▪ Kula Aupuni Niʻihau A Kahelelani Aloha Public Charter School ▪ St. Theresa's School

Legend: AMVETS = American Veterans; BLNR = Board of Land and Natural Resources; CZM = Coastal Zone Management; DLNR = Department of Land and Natural Resources; DOFAW = DLNR Division of Forestry and Wildlife; DON = Department of the Navy; NHO = Native Hawaiian Organization; OHA = Office of Hawaiian Affairs; OPSD = Office of Planning and Sustainable Development; SHPD = State Historic Preservation Division; U.S. = United States; USDA = U.S. Department of Agriculture; USFWS = U.S. Fish and Wildlife Service.

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Appendix D
Detailed List of Activities and Operational Elements Under Current Real Estate Agreements

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D.1 List and Description of Navy Leaseholds and Easements

List and Description of Leases and Easements at the Main Base

Table D.1-1 includes a list of activities or operational elements for leaseholds and easements at the main base.

Table D.1-1 Navy Leases and Easements on State Land at the Main Base

Name	Grant Type	Activity/Operational Element	Size (ac)
Tract E-1	Lease	Contains ordnance related facilities, and lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	69.562
Tract E-2 Tract E-2-A	Lease	Operations. Includes lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	45.268 0.777
Lot B	Lease	Encroachment.	32.070
Lot 1	Lease	Drainage.	47.937
Lot 9	Lease	Drainage.	12.422
Lot 3	Lease	Access.	0.232
Lot 10	Lease	Drainage. Includes lands required to facilitate the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	5.171
Lot 13	Lease	Access. Includes lands required to facilitate access in support of the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	0.434
Lot 7	Lease	Access. Includes Exclusive Roadway Access Easement.	1.618
Lot A-1	Lease	Encroachment/Drainage. Includes Non-Exclusive Drainage Easement and Roadway Access Easement.	176.16
		Main Base Leases Subtotal	**391.651**
Easement 100 Easement 101 Easement 102 Easement 103 Easement 104 Easement 105	Easement	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	122.011 1,841.53 3,150.093 8.691 9.489 17.875
Easement 107 Easement B Easement B-1 Easement B-2 Easement B-3 Easement B-4	Easement	Includes Non-Exclusive Roadway Access Easement.	0.170 3.084 0.069 0.069 0.044 0.067
Easement D	Easement	Electrical.	1.363
Easement E	Easement	Roadway.	0.441
Easement F	Easement	Cable.	0.049
Easement G Part 1	Easement	Water.	0.671
Easement G Part 2	Easement	Water.	0.138
Easement H	Easement	Roadway.	0.028
Easement A Part 1	Easement	Access.	2.141

Name	Grant Type	Activity/Operational Element	Size (ac)
GHA Easement 1 GHA Easement 2	Easement	Ground hazard area.	2,039.167 69.579
		Main Base Easements Subtotal	**7,266.769**
		Main Base Total Leases and Easements	**7,658.42**

Key: ATFP = Antiterrorism and Force Protection; GHA=Ground Hazard Area.

List and Description of Leases and Easements at Kamokalā Ridge

Table D.1-2 includes a list of activities or operational elements for leases and easements at Kamokalā Ridge.

Table D.1-2 Navy Leases and Easements on State Land at Kamokalā Ridge

Name	Grant Type	Activity/Operational Element	Size (ac)
Tract E-3 Parcel 1 Tract E-3 Parcel 2	Lease	Magazines 1-12 are utilized for proper storage of explosives with effective flexibility to separate incompatible explosives.	25.686 48.777
Kamokalā Ridge Add	Lease	Magazines 12-13 are required for proper storage of explosives with effective flexibility to separate incompatible explosives.	14.372
		Kamokalā Ridge Leases Subtotal	**88.835**
Easement 106	Easement	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	176.372
Easement A Part 2 Por. A Easement A Part 2 Por. B Easement A Part 2 Por. C Easement A Part 2 Por. D Easement A Part 3	Easement	Includes Non-Exclusive Roadway Access Easement.	0.627 0.558 0.042 0.221 0.455
Easement G Part 3 Easement G Part 4 Easement G Part 5 Easement G Part 6	Easement	Water pipeline.	0.186 0.153 0.006 0.021
ESQD Easement S5604	Easement	Restrictive Use.	176.371
		Kamokalā Ridge Easements Subtotal	**355.012**
		Kamokalā Ridge Total Leases and Easements	**443.847**

Key: ESQD = Explosive Safety Quantity Distance.

List and Description of Leases at the Mānā Water Well

Table D.1-3 includes a list of leases at the Mānā Water Well.

Table D.1-3 Navy Leases on State Land at the Mānā Water Well

Name	Grant Type	Activity/Operational Element	Size
Tract E-4	Lease	Infrastructure associated with well.	0.264
Lot 12	Lease	Location of water well.	0.026
		Water Well Total Leases	**0.29**

List and Description of Leases at Miloliʻi Ridge

Table D.1-4 includes a list of activities or operational elements for leases at Miloliʻi Ridge.

Table D.1-4 Navy Leases on State Land at Miloliʻi Ridge

Name	Grant Type	Activity/Operational Element	Size (ac)
Miloliʻi Ridge No. 1 Miloliʻi Ridge No. 2 Miloliʻi Ridge No. 3	Lease	Location of frequency shift reflector used with radar and telemetry stations.	0.005 0.005 0.005
		Miloliʻi Ridge Total Leases	**0.015**

List and Description of Leases and Easements at Mākaha Ridge

Table D.1-5 includes a list of activities or operational elements for leases and easements at Mākaha Ridge.

Table D.1-5 Navy Leases and Easements on State Land at Mākaha Ridge

Name	Grant Type	Activity/Operational Element	Size
Parcel A – Mākaha Parcel B – Mākaha	Lease	The location has a guarded, secured entrance, a Frequency Interference Control Building, Maintenance Facility, Telemetry Building, a boresight tower, telemetry antennas, water tanks, a laboratory, radar sites, communications, a small power plant, antennas, and a helicopter landing pad. Most of these structures are on the top of the ridgeline and are in the line of sight of the Main Base. Unique location due to geography allowing coverage of both the base and ocean range.	35.04 167.05
Bore Site	Lease	Used to locate bore site targets for use with radar and telemetry stations.	1.012
		Mākaha Ridge Lease Subtotal	**203.102**
Parcel E Road	Easement	Includes Non-exclusive Roadway Access Easement.	4.53
Parcel D Road Parcel C Road	Easement	Includes Non-exclusive Roadway Access Easement.	26.25 10.82
Bore Site Access Road	Easement	Includes Non-exclusive Roadway Access Easement.	0.613
		Mākaha Ridge Easement Subtotal	**42.213**
		Mākaha Ridge Total Leases and Easements	**245.315**

D.2 List and Description of NASA Leaseholds

Table D.2-1 includes a list of activities or operational elements for leaseholds and easements at Kōkeʻe Park Geophysical Observatory (KPGO).

Table D.2-1 Navy Leases and Easements on DLNR Land at KPGO

Name	Grant Type	Activity/Operational Element	Size
Sites A – E (6 parcels)	Lease	Facility housing radar antenna. Unique location due to geography allowing coverage of both the base and ocean range.	22.900

D.3 General Description of Navy and NASA Real Estate Agreements with DLNR

Tables D.3-1 and **D.3-2** provide the location, number, size, type, expiration, and general type of associated actions for the existing leaseholds and easements. *Note to reviewer: This table, including acreages, will be updated when the Report to Congress is updated.*

Table D.3-1 Navy Leases on Kaua‘i with State of Hawai‘i

Site Name	City	Size (acres)	Type	Lessor	Expiration Fiscal Year	Renewal Fiscal Year
PMRF Lease S-3852	Kekaha	480.78	LEASE	State of HI	2029	2029
PMRF Lease S-3852	Kekaha	10.18	EASEMENT	State of HI	2029	2029
PMRF Mākaha Ridge Lease S-3952	Kekaha	203.10	LEASE	State of HI	2030	2030
PMRF Mākaha Ridge Lease S-3952	Kekaha	7722.21	EASEMENT	State of HI	2030	2030
PMRF Miloli‘i Ridge Easement S-5352	Kekaha	2108.75	EASEMENT	State of HI	2030	2030
PMRF Miloli‘i Ridge Easement S-5804	Kekaha	5326.23	EASEMENT	State of HI	2029	2029
PMRF Easement S-5604	Kekaha	176.37	EASEMENT	State of HI	2029	2029

Source: Draft Report to Congress on the Department’s Efforts to Renew Department of Defense Leases and Easements in Hawai‘i, September 2023.

Table D.3-2 NASA Leases on Kaua‘i with State of Hawai‘i

Site Name	City	Size (acres)	Type	Lessor	Expiration Fiscal Year	Purpose and Associated Actions
Kōke‘e Park Geophysical Observatory (6 parcels)	Waimea	23	LEASE, EASEMENT	State of HI	2030	Collect geodetic data, contribute to daily measurements of the Earth’s orientation in space and rotation.

Appendix E
No Action Alternative: Detailed List of Activities/Operations

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Table E-1 lists the operational impacts by lease and easement if succeeding agreements are not secured.

Table E-1 No Action Alternative: Operational Impacts

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Main Base			
Tract E-1	L	Contains ordnance related facilities, and lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	Leased area contains ordnance related facilities critical to the support of the PMRF mission. Inability to perform launch operations would result in lack of ability to support various Navy missions. Also, reduction in security posture and increased costs to meet ATFP requirements. Due to land limitations, there is nowhere else to relocate the buildings on Navy fee simple lands.
Tract E-2 Tract E-2-A	L	Operations. Includes lands required to comply with Federal ATFP guidelines regarding setback distances around military bases.	Reduction in security posture and increased costs to meet ATFP requirements.
Lot B	L	Encroachment.	Reduction in security posture and increased costs to meet ATFP requirements.
Lot 1	L	Drainage.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State of Hawaiʻi would take over management of the drainage.
Lot 9	L	Drainage.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State of Hawaiʻi would take over management of the drainage.
Lot 3	L	Access.	Used as secondary entrance to the base and is the ordnance gate (for transport of ordnance from main base to Kamokalā Ridge). There would be impacts to public safety if ordnance transport went through the main gate.
Lot 10	L	Drainage. Includes lands required to facilitate the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage.
Lot 13	L	Access. Includes lands required to facilitate access in support of the operation and maintenance of drainage ditches and pumps to protect adjacent lands from flooding.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Lot 7	L	Access. Includes Exclusive Roadway Access Easement.	Operations gate, which is open in the morning and afternoon, and provides secondary entrance to the base. Without this access, there would be no other entrance if the primary entrance were to be temporarily shut down, and this would impact access to critical PMRF facilities.
Lot A-1	L	Encroachment/Drainage. Includes Non-Exclusive Drainage Easement and Roadway Access Easement.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH hazards. Without PMRF management of that land, State would take over management of the drainage. Also, would impact access to critical PMRF facilities.
Easement 100 Easement 101 Easement 102 Easement 103 Easement 104 Easement 105	E	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	If existing agricultural lands were to flood, PMRF would experience increased vulnerability to encroachment and BASH events. 100-103 within GHA and ESQD arcs, 104-105 to prevent encroachment.
Easement 107 Easement B Easement B-1 Easement B-2 Easement B-3 Easement B-4	E	Includes Non-Exclusive Roadway Access Easement.	This would impact access to critical PMRF facilities, and impact access to the base's main source of potable water.
Easement D	E	Electrical.	Lack of access to critical PMRF facilities.
Easement E	E	Roadway.	Lack of access to critical PMRF facilities.
Easement F	E	Cable.	Lack of electrical service to critical PMRF facilities.
Easement G Part 1	E	Water.	Lack of communication service to critical PMRF facilities.
Easement G Part 2	E	Water.	Lack of water service to critical PMRF facilities.
Easement H	E	Roadway.	Lack of access to critical PMRF facilities.
Easement A Part 1	E	Access.	Lack of access to critical PMRF facilities.
GHA Easement 1 GHA Easement 2	E	The GHA for many of the ballistic and hypersonic missiles launched from PMRF extends into the Mānā Plain.	Restriction of the GHA to only federal property will mean no ballistic or hypersonic missiles can be safely launched from PMRF.
Kamokalā Ridge			
Tract E-3 Parcel 1 Tract E-3 Parcel 2	L	Magazines 1-12 are utilized for proper storage of explosives with effective flexibility to separate incompatible explosives.	Inability to meet ordnance safety storage requirements would result in lack of ability to support aerial target and ballistic and hypersonic missile missions.
Kamokalā Ridge Add	L	Magazines 12-13 are required for proper storage of explosives with effective flexibility to separate incompatible explosives.	Inability to meet explosive safety storage requirements resulting in lack of ability to support various missions at PMRF.
Easement 106	E	Includes use of the lands for agricultural purposes to preclude encroachment on operations by development.	Potential for encroachment due to development and incompatible uses to current Navy operations to include RF spectrum interference, lighting that may impact NVG training, AICUZ concerns, etc.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Easement A Part 2 Por. A Easement A Part 2 Por. B Easement A Part 2 Por. C Easement A Part 2 Por. D Easement A Part 3	E	Includes Non-Exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Easement G Part 3 Easement G Part 4 Easement G Part 5 Easement G Part 6	E	Water pipeline.	Lack of access to critical PMRF facilities.
ESQD Easement S5604	E	Restrictive Use.	Lack of access to critical PMRF facilities.
Mānā Water Well			
Tract E-4	L	Infrastructure associated with well.	Reduced reliability of potable water source and increased cost of water. Impacts to range operations from loss of water source.
Lot 12	L	Location of water well.	Reduced reliability of potable water source and increased cost of water.
Miloli‘i Ridge			
Miloli‘i Ridge No. 1 Miloli‘i Ridge No. 2 Miloli‘i Ridge No. 3	L	Location of frequency shift reflector used with radar and telemetry stations.	Inability to calibrate instrumentation and antennas which would limit effectiveness during data collection and could result in safety issues related to tracking of vehicles on the range.
Mākaha Ridge			
Parcel A – Mākaha Parcel B – Mākaha	L	Facility housing radar antenna. Unique location due to geography allowing coverage of both the base and ocean range. The vast majority of PMRF instrumentation exists at Mākaha Ridge to include radar systems, telemetry, communications, electronic warfare assets, etc.	Without the instrumentation located at Mākaha Ridge, almost all of PMRF's training and testing missions will be unsupportable since loss of the data provided by that instrumentation will make it impossible to provide range safety oversight, management and coordination of air and sea space under the control of PMRF, execution of exercises/tests and collection of customer required data.
Bore Site	L	Used to locate bore site targets for use with radar and telemetry stations.	Loss of this facility would limit PMRF support of Pacific Fleet training operations and national test initiatives. Inability to calibrate instrumentation and antennas which would limit effectiveness during data collection and could result in safety issues related to tracking of vehicles on the range.
Parcel E Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Parcel D Road Parcel C Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.
Bore Site Access Road	E	Includes Non-exclusive Roadway Access Easement.	Lack of access to critical PMRF facilities.

Name of Parcel	Grant Type (Lease/ Easement)	Activity/Operational Element	Operational Impact if Agreement Not Renewed
Kōkeʻe Park Geophysical Observatory			
S-3917 6 parcels	L	Includes facilities (buildings, RADAR, antenna, transmitters) that support Navy and NASA operations.	Loss of Navy radar and telemetry systems at KPGO would also limit effectiveness during data collection and could result in safety issues related to tracking on the range. Loss of Site B which includes the back-up plant diesel generator for Sites A, C, D, and E would impact the source of reliable power when systems at KPGO are supporting Navy range operations and NASA SGP activities. Without use of Sites A through E at KPGO, NASA would lose its northern Pacific VLBI and DORIS stations, and two GNSS stations, substantially reducing the capability of NASA's global Space Geodesy Project to support the following: spacecraft tracking; as well as military and civilian terrestrial, airborne, and maritime navigation; and the scientific disciplines that rely on the data produced at KPGO.

Key: AICUZ = Air Installation Compatible Use Zone; ATFP = Antiterrorism and Force Protection; BASH = Bird/Wildlife Aircraft Strike Hazard; DORIS = Doppler Orbitography and Radio-positioning Integrated by Satellite; ESQD = Explosive Safety Quantity Distance; GHA = Ground Hazard Area; GNSS = Global Navigation Satellite System; KPGO = Kōkeʻe Park Geophysical Observatory; NASA = National Aeronautics and Space Administration; NVG = Night Vision Goggles; PMRF = Pacific Missile Range Facility; RADAR=Radio Detecting and Ranging; RF=Radio Frequency; SGP = Space Geodesy Project; VLBI=Very Long Baseline Interferometry.

Attachment C

EVENTFUL

A SUNRISE TO SUNSET LOOK AT SOME OF THE BIGGEST EVENTS ON KAUA'I

EMAIL APANG@MIDWEEK.COM

MAY 25
YOGA MORNING

PHOTO COURTESY GETTY IMAGES/ AJA KOSKA

Participate in a yoga practice and a class at the Hanalei farmers market in Hale Hālāwai 'Ohana O Hanalei. Learn from international yoga and meditation teacher Mary Susan Stults. The farmers market will run from 9:30 a.m. to noon. Admission is $25.

Saturday, May 25, 10-11:30 a.m.
For more info, visit eventbrite.com (search "Yoga at the Farmers' Market in Hanalei, Hawaii")

23 MAY
DOG THERAPY

Youth ages 12-18 are welcome to de-stress with Gus Gus the mini golden-doodle at Līhu'e Public Library. Gus Gus will visit with his owner, Jeff. Attendees can pet, sit, talk to and hang out with the pup. A same-day sign-up is required and limited slots are available.

Thursday, May 23, 2:30-3:30 p.m.
For more information, call 808-241-3222

26 MAY
MAKERS MARKET

Every fourth Sunday of the month, the Wailua Bay Creators Fair takes over Hilton Garden Inn Kauai Wailua Bay. Vendors sell everything from art, clothing and accessories to photography, wood carvings, home decor and so much more — and it's all Kaua'i-made. There will also be live entertainment and food for purchase.

Sunday, May 26
8:30 a.m.-1 p.m.
For more information, visit gohawaii.com.

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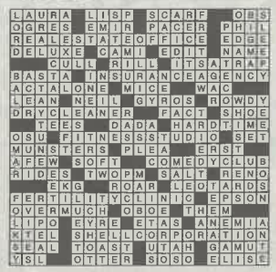
Answers To This Week's
SUDOKU PUZZLE

6	4	2	7	1	9	5	3	8
9	5	1	2	8	3	7	6	4
3	7	8	5	6	4	2	9	1
7	3	9	1	2	8	6	4	5
1	2	4	6	3	5	8	7	9
8	6	5	9	4	7	1	2	3
2	9	6	3	5	1	4	8	7
4	1	7	8	9	6	3	5	2
5	8	3	4	7	2	9	1	6

Answers To This Week's
CROSSWORD PUZZLE



Answers To This Week's
SPOT 10 DIFFERENCES

U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawai'i for the Pacific Missile Range Facility (PMRF) and the Kōke'e Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in the environmental planning process.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawai'i lands on Kaua'i for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawai'i land on Kaua'i for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

The Navy and NASA will host public scoping meetings at three locations on Kaua'i. Attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this planning process. Meetings will be held from 5 to 8 p.m. HST at the following locations:

PUBLIC SCOPING MEETINGS

Tuesday, June 4, 2024	Wednesday, June 5, 2024	Thursday, June 6, 2024
Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Līhu'e	Kekaha Neighborhood Center 8130 Elepaio Road, Kekaha	Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.	Project presentation by Navy and NASA.

The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawai'i Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

The public scoping period begins ***May 8, 2024, and ends June 17, 2024***. Please attend a public scoping meeting and visit the project website to learn more. For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Submit Comments in Person, Online, or by Mail. Submit comments by ***June 17, 2024***. The public may submit comments in any of the following ways: In person at a public scoping meeting, through the project website at PMRF-KPGO-EIS.com, by email to info@PMRF-KPGO-EIS.com, or by mail, postmarked by ***June 17, 2024*** to the following address: Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2, Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, 400 Marshall Road, Building X-11, Pearl Harbor, HI 96860.

For more information visit PMRF-KPGO-EIS.com

SALARY

Continued from **A1**

student performance rank in the top 10 nationwide. "That is a direct result from the superintendent, his team, our teachers, our principals and vice principals," he said.

However, Ward earlier called Hawaii's public education system mediocre.

"I would be willing to pay $500 million or $100 million, or $10 million, or whatever it takes to get us in the top five or the top 10 in the nation," Ward said. "Right now we can't even read and do math in third grade."

Ward said he would support increasing the superintendent's salary if the performance was worthy.

"I'm not sure we've agreed to reward something that otherwise is mediocrity," Ward said.

Currently, the state Board of Education does not have a suggested salary for the superintendent.

Former BOE Chair Warren Haruki previously said during a public meeting that the BOE should consider establishing a salary commission to review the superintendent's salary.

State Rep. Trish La Chica (D, Waipio-Mililani) — vice chair of the House Education Committee — emphasized that SB 3207 does not call for an immediate raise. The superintendent would still be subject to a thorough review process by the BOE.

"This is really a policy of ensuring stability in our leadership," she said.

Woodson later told the Honolulu Star-Advertiser that he's in "robust and very strong support" of SB 3207 and called Hayashi a "very hard worker."

The perception of those in opposition to the bill, Woodson said, does not align with reality.

He thanked Hayashi's team and his leadership in placing Hawaii's fourth grade reading scores in the top 10 nationwide, and praised Hayashi's "particular sprinting of how he worked during the fires."

If the superintendent's salary cap doesn't increase, Woodson said other salary problems could arise for positions including the assistant superintendent and deputy superintendent, whose pay are linked to the superintendent's.

"That would have compounding negative impacts because then you have the complex-area superintendents, whose pay is aligned with the deputies and assistants, and then you have principals and vice principals," Woodson said. "It would basically force all the compensation down to the school level, potentially downward. That is the wrong direction."

La Chica said during the House floor session that reducing the superintendent's salary back to $150,000 could trigger an exodus of "great administration and the leader" who oversee 20,000 employees.

Vanessa Otts, a former DOE teacher for 5-1/2 years, testified in writing that the superintendent should not be entitled to higher pay.

However, she also doesn't want other administrators' pay to be limited.

"If the superintendent's salary reverts to $150,000 after his contract expires in 2025, then anyone making more than that would also have a salary reduction because there's a rule that none of the Superintendent's subordinates can earn more than the boss," Otts wrote.

Otts then told the Star-Advertiser that raising the salary cap could be a good idea if the Legislature provides data in support.

During a March House Education Committee meeting, Haruki pointed out that among six other school districts of comparable size and student enrollment, Hayashi has the lowest salary at $248,000.

Among the six other districts, the second-lowest-paid superintendent earns $280,000. Others are paid $310,000, $330,000, $380,000 and $598,000 — in Georgia's Gwinnett County, Haruki said.

But Otts said Hayashi's salary of $248,000 earns him more than 30 0ther state superintendents across the country.

"This session, they were saying how there's no money for important things in the Department of Education and all they seem to be interested in is raising the salaries of people who are already making six figure salaries," Otts said. "It seemed like they wanted to raise the salaries simply so that they could raise all the other salaries underneath them."

PHOTOS BY **CINDY ELLEN RUSSELL** / CRUSSELL@STARADVERTISER.COM

CAMERAS

Continued from **A1**

on Thursday. "The majority of the victims for these crimes are tourists."

According to Resolution 64, "tourists are known to leave cameras, sunglasses, wallets, purses and other valuables in their vehicles while visiting the scenic points, making the vehicles susceptible to unauthorized entry into a motor vehicle violations (i.e. break-ins), thefts, and subsequent financial fraud and other related crimes."

Although auto burglaries are seasonal — with more incidents occurring during the summer as visitors arrive to the island — on average, HPD receives about 50 car break-in reports monthly, he said.

But as far as HPD's sought-after camera technology to catch thieves or avert crimes, Lynch said it's not anything new. "It's the same as being used in Chinatown and in Waikiki," he added.

Still, East Oahu's surveillance cameras will be a bit different.

Instead of being attached to street lights or poles at fixed locations in urban Honolulu, HPD wants to lease portable trailers that will feature cameras atop a mastlike pole.

"These cameras are the things you kind of see in Home Depot or Lowe's parking lot or even Longs

The Halona Blow Hole parking lot is one of the sites being considered for the mobile video surveillance cameras to deter vehicle break-ins. Above, Jasmin Platcer and Elizabeth Schirnhofer, both visiting from Austria, took a selfie Tuesday at the blow hole. At left, a camera towers over the Moiliili Longs Drugs parking lot.

Moiliili; there's the white trailer with the blue light on it, and it's got the tall mast," Lynch told the committee. "These cameras are deterrents, in the sense that when the bad guys know when someone is watching, they change their behaviors or they go somewhere else."

The cost to the city will be about $3,000 a month per security trailer, according to Lynch.

Video footage gleaned from these mobile cameras will be used to identify suspects. "If we can identify them, then we can go after them and prosecute them for the crime that they committed in front of the camera," he said.

Lynch said this program could be applied to other spots around Oahu. "Within the rules and the laws, they can be moved into other areas, and they can assist us in the same way the private sector uses them to protect their assets," he said.

Committee Chair Val Okimoto asked whether someone could steal these largely unattended mobile trailers.

"Well, they secure them," Lynch replied, adding, "What we used to do is take the tires off the trailer and put them on blocks. That way they can't take them away."

He noted the project's main benefit is that HPD will not be using city-owned equipment.

"We're going to lease them," said Lynch. "And so, if they get damaged or stolen or whatever … it's on the leasing company. … If it's broken or damaged, they pull the old one out, and they bring us a new one that's ready to go. So we don't have to deal with the maintenance or the fixing or the repairing or any of that."

And he stressed it would be premature for the city to own this equipment.

"There's a huge avenue of infrastructure required to have these cameras," he said, noting, "Footage is recorded and remotely monitored."

Okimoto also asked how the video footage would be reviewed, by HPD or others.

"Part of the lease is actually somebody sitting there watching it, not one of us," Lynch said, alluding to HPD's ongoing staffing shortage of more than 400 officers. "It's somebody with this leasing company that we would be dealing with. That's another attractive grab for us in the sense that it's cheaper to have this person do that than it would (be for the police). And then there's rules about us watching and stuff like that."

Lynch noted recorded video footage would only cover daylight hours. "Because at night these (crimes) don't happen," he added.

Before the meeting, City Council Chair Tommy Waters — whose Council district covers East Honolulu — told the Honolulu Star-Advertiser that HPD has allocated $64,000 toward this pilot project for fiscal year 2025 only, which begins July 1.

"Public safety remains our top priority. In 2023 alone, 225 vehicle break-ins were reported at East Honolulu lookouts," Waters said via email. "The proposed resolution aims to tackle the disturbing criminal activities at East Honolulu's scenic lookouts."

But HPD's proposed surveillance program has drawn mixed reactions.

Via written testimony, East Oahu resident Maddy Walsh said she backed the idea "because I believe it will enhance my own safety and peace of mind, deter theft and other crimes in these areas, and act as an efficient use of Hawaii's law enforcement resources."

"While the language of this resolution seems to be targeted more towards helping tourists, I think this resolution will have an overall positive impact on the safety and peace of mind of locals like me who leave their cars unattended to hike and visit these East Oahu sites," she said.

Oahu resident Natalie Iwasa said she opposed the project.

"Concerns I have with overt government surveillance include the impact it has on people, e.g., 'the chilling effect' of public surveillance," Iwasa wrote in her public testimony. "It can cause people to decide against exercising their basic rights, like freedom of speech or peaceful protest."

In spite of privacy concerns, Waters said the project has received other levels of support.

"Within the East Oahu communities, my understanding is that the Hawaii Kai Neighborhood Board and community members support the pilot project," he said. "Additionally, the Waialae-Kai Neighborhood Board requested overt video monitoring for the Diamond Head Lookouts at the April 18, 2024, meeting."

Although Resolution 64 was heard, Okimoto postponed the item. After the meeting, Jame Schaedel, Okimoto's policy adviser, said the resolution was deferred for amendments and will return May 23 for further review.

Meanwhile, HPD did not immediately respond to questions over which company will contract with the city to lease these security trailers.

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O'ahu housing market bounces back in April

Andrew Gomes
STAR-ADVERTISER

HONOLULU — O'ahu's housing market rebounded in April with year-over-year gains after mostly slumps in March.

Sale volume and median prices both rose for single-family houses and condominiums in April compared with the same month in 2023, according to data released Monday by the Honolulu Board of Realtors.

The single-family home market had bigger gains, with a 26 percent jump in sales to 262 in April from 208 a year earlier, and a 10 percent rise in the median sale price to $1,100,000 from $999,995.

For condos the number of sales edged up 2.6 percent to 431 in April from 420 a year earlier while the median price increased 5.6 percent to $528,000 from $500,000.

The gains in April followed mostly year-over-year decreases in March. For sales the declines in March ranged from 2.5 percent for single-family homes to 22.5 percent for condos.

Median prices in March were mixed, with a 1.5 percent tick higher for single-family homes and a 6.7 percent drop for condos.

The median price is a point at which half the sales were for more and half were for less.

Fran Gendrano, president of the Honolulu Board of Realtors and principal broker at KFG Properties Inc., said in a statement that despite the momentum change, sales remained at softened levels compared with recent years.

The report from the trade association said that based on a 12-month moving average of sales, April's average trailed the pre-pandemic moving average in 2019 by about 26 percent for single-family homes and 18 percent for condos, and was about 40 percent below the peak moving averages in 2021 and 2022.

CINDY ELLEN RUSSELL / STAR-ADVERTISER

This duplex property with a combined five bedrooms and four bathrooms on a 3,672-square-foot lot in Lilʻiha sold in April for $1.1 million, which also was the median sale price for all single-family homes sold on Oʻahu in April.

High mortgage interest rates, which more than doubled from about 3 percent in early 2022, have been a big drag on sales.

Yet, despite the average 30-year fixed rate rising to 7.2 percent last week from 6.6 percent in January, Gendrano said the positive movement in Oahu's housing market from March to April is a good sign.

"The month-over-month rise in sales indicates buyers are active in the market despite higher mortgage rates," she said.

Chad Takesue, chief operating officer for local real estate brokerage firm Locations, said in a Monday company report that Oʻahu's housing market is "muted but stable."

Takesue expects steady sales and moderate price increases to continue through summer months that represent the peak home-buying season.

"Pent-up buyer demand is counteracting the dampening effects of higher mortgage rates and economic uncertainty," he said in the report.

Takesue also said that some softness in the condo market has been due to challenges in the cost and availability of property insurance but that this situation is expected to be temporary because constraints in the affordability and availability of single-family homes will drive activity in the condo market.

Generally, levels of inventory of homes for sale and buyer demand continue to favor sellers.

Inventory of homes for sale at the end of April would be depleted in 2.8 months for single-family homes and 4.2 months for condos if no new inventory were added and demand stayed at the monthly average from the past 12 months, according to the Board of Realtors report.

'Compulsive gambler' asks for 30-month federal sentence

Peter Boylan
STAR-ADVERTISER

A Kona man who bilked 45 investors in his online lei business out of $1.2 million to fuel a high-stakes gambling habit in Las Vegas is asking a federal judge to sentence him Wednesday to 2-1/2 years in prison.

Newton Kaleo Okamoana Deleon, 48, is a "compulsive gambler," and his habit led him "down a path of destruction" that cost him his career as an educator, his marriage and a relationship with his three children, his attorney, Michael Green, wrote in a sentencing memorandum filed April 30.

From at least 2017 and continuing through December 2020, Deleon used money from his investors to pay for his wagering addiction.

When he was up big, Deleon wrote to senior U.S. District Judge Hellen Gillmor that he "lived a whole month in the Penthouse suite at the Bellagio. I was gambling everyday. I'd lose, then I'd get more money (through the fraudulent activity associated with the case) and I went on this crazy streak. At one point, I was up $600,000 in two days. … I bought two Rolexes and two cars, a Chevy Tahoe and a Chevy Traverse … and in less than 24 hours I lost all the money. I had to go back to the dealer to return my car."

His gambling got so severe that at one point Deleon was "living in his car with no money for shelter." After losing $300,000 in Las Vegas in 2020, Deleon wrapped the cord of a blow dryer around his neck and tried to kill himself.

Green also asked that Deleon be required to undergo treatment for addiction.

Deleon was on supervised release in California where he lived before sentencing, but has been in custody since Jan. 22 at the Metropolitan Detention Center, Los Angeles.

Deleon was allegedly arrested Jan. 22 in Santa Ana, Calif., "for an offense in violation of federal, state, or local law while on pretrial release, in violation of the standard conditions of pretrial release," according to federal court records.

Deleon was arrested following a fight with his fiancee, which Deleon described as a "loud verbal argument" in a letter to Gillmor.

Prior to his arrest, Deleon, who earned undergraduate and master's degrees, was working for the Vista Unified School District in North San Diego providing online classes to students enrolled in Advanced Placement biology and AP environmental science courses.

In 2018, with his "marriage in shambles," Deleon concocted a scheme to fuel his gambling habit where investors would put $5,000 into his business for a period of three months and get at least $7,500 back.

In the agreements he asked investors to sign with his business, leiorders.com, Deleon would repay the investors their "principal loan investment plus a substantial return within a set time frame, usually approximately one month," according to a federal criminal information authored by Assistant U.S. Attorney Rebecca A. Perlmutter and filed Sept. 6.

"(Deleon) also promised to repay a return of profit, ranging from approximately 10 percent to 40 percent and additional fees ranging between approximately $100 to $500 per day if the principal and return were not repaid by the agreement's designated approximate one-month period." Deleon "well knew that he would not be able to repay the principal" or additional return promised in the agreements.

Deleon allegedly told investors that he needed investment funds to buy "flowers and supplies for lei purchase orders that he already had executed with third parties," like well-known casino hotels in Las Vegas, according to federal court records.

He told one investor that once the lei were delivered to the third parties, the third parties would "take approximately one month to pay" Deleon and that Deleon would then "repay the principal investment loan and split the profit" with the investors as a return.

He created loan agreements and promissory notes to give the "false appearance of legitimate financial transactions upon which investors could rely."

Deleon used "unauthorized and false branded logos and forged signatures" to fool investors into buying Deleon's story that he had large business lei orders with third parties.

Deleon entered into a plea agreement with the U.S. Department of Justice on Sept. 25 to plead guilty to "engaging in a wire fraud scheme and artifice to defraud and engaging in monetary transactions in property derived from specified unlawful activity."

In exchange, federal prosecutors agreed not to file additional charges related to the wire fraud scheme, including any "aggravated identity theft charges," based on the information now known to the government.

He is facing up to 20 years in federal prison, up to a $250,000 fine and three years of federal probation after he gets out on the wire fraud charges and up to 10 years, a fine of up to $250,000 and three years of supervised release on the property transaction charge.

In an April 30 letter to Gillmor, Deleon apologized to the "victims who I hurt emotionally, financially and morally. I am very sorry for taking advantage of their kindness and honesty to commit the crimes I am guilty of. I am sorry for using the trust they had in me by taking their hard earned money and using it to feed my gambling addiction."

"There is no excuse for my action and for what I have done to all of them I take full responsibility," wrote Deleon.

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nation&world

AFP / GETTY IMAGES

The U.S. has stepped up its criticism of Israel, saying it's not doing enough to protect Palestinian civilians in the Gaza Strip. People inspected an impact crater Wednesday at the site of a building bombed by Israel in Rafah, in the southern Gaza Strip.

U.S. delays weapons shipment to Israel over invasion concerns

Jordan Fabian, Galit Altstein and Roxana Tiron
Bloomberg News

Defense Secretary Lloyd Austin said the U.S. has paused the supply of "high-payload" munitions to Israel over concerns about a potential military offensive on the Gazan city of Rafah.

The delivery was supposed to contain 3,500 bombs, split roughly evenly between 2,000-pound and 500-pound explosives, according to a senior administration official. Austin, speaking separately, said no final decision has been made on the shipment.

Israel needs to account for the protection of civilians in Rafah, where the U.S. wants "no major conflict to take place," Austin told a Senate Appropriations panel Wednesday. Washington is worried about the damage the large bombs could inflict on dense urban areas like Rafah, where about 1.4 million Palestinians are sheltering from Israel's war with Hamas.

Austin said a 2,000-pound bomb could do a lot of "collateral damage."

Israeli Prime Minister Benjamin Netanyahu's office declined to comment on the weapons delay, and it's unclear if it will have much impact on the military's operations in Gaza. Still, it speaks to growing tensions between Netanyahu and President Joe Biden, who's voiced opposition to an attack on Rafah and reaffirmed that message in a call between the leaders Monday.

Privately, Israeli officials have expressed deep frustration and warned their U.S. counterparts the delay could jeopardize cease-fire and hostage negotiations at a crucial moment, according to a person briefed on the discussions. The Israelis told U.S. officials that pressure should be put on Hamas, not on Israel, the person added, declining to be named in order to detail the sensitive discussions.

The U.S. has stepped up its criticism of Israel in recent months, saying it's not doing enough to protect civilians and allow aid into the besieged Palestinian territory, parts of which the United Nations says are on the verge of famine. "There have been far too many casualties in this battle space," Austin said.

At the same time, Biden has said his support for Israel is ironclad, and he's defended its right to pursue a strategy of destroying Hamas, an Islamist group backed by Iran.

Austin was questioned about the weapons shipment by members of the congressional panel. "Does this not send the wrong message to our ally Israel and embolden Iran and Iranian-backed groups?" asked Sen. Jerry Moran, a Kansas Republican. "We should not signal to our enemies that our support is conditional."

Republican Sen. Susan Collins of Maine called the pause "a decision that most members of Congress would take issue with."

But the Biden administration signaled it might hold up other shipments to Israel. In a briefing Wednesday, State Department spokesman Matthew Miller said the U.S. was "reviewing other potential weapon systems," although he declined to go into detail.

Biden's decision on the arms supplies marks one of the most significant moments of discord between Israel and its most important ally since Hamas' Oct. 7 assault, which started the war. Hamas, designated a terrorist organization by the U.S., killed 1,200 people and abducted roughly 250 when its fighters stormed into southern Israel from Gaza.

Israel's retaliatory bombardment and ground offensive on the Mediterranean enclave have killed almost 35,000 people, according to the Hamas-run health ministry.

This week, Israel told residents in some parts of eastern Rafah to move out immediately in a possible prelude to an assault. It urged them to travel north to a "humanitarian area" near the Gazan city of Khan Younis, much of which has been destroyed. Israel says it's working to ensure there will be enough tents, food and medicine for the civilians.

Israel's military also took control of and closed the Rafah border crossing between Gaza and Egypt on Tuesday. It's the main entry point for aid going into Gaza and the United Nations said it should be reopened quickly.

On Wednesday, Israel reopened the nearby Kerem Shalom crossing and said trucks with humanitarian supplies were moving into Gaza. For now, Israeli officials are saying their operations in Rafah are limited and are downplaying the notion that a full-on offensive has begun.

Airstrikes further strain Ukrainian energy system

By Anastasiia Malenko and Pavel Polityuk
Reuters

KYIV, UKRAINE >> Russian missiles and drones struck nearly a dozen Ukrainian energy infrastructure facilities Wednesday, causing serious damage at three Soviet-era thermal power plants and blackouts in multiple regions, officials said.

Ukraine's air force said it shot down 39 of 55 missiles and 20 of 21 attack drones used for the attack, which piles more pressure on the energy system more than two years after Russia launched its full-scale invasion.

"Another massive attack on our energy industry!" Energy Minister German Galushchenko wrote on the Telegram app.

Two people were injured in the Kyiv region and one was hurt in the Kirovohrad region, Interior Minister Ihor Klymenko said.

Galushchenko said power generation and transmission facilities in the Poltava, Kirovohrad, Zaporizhzhia, Lviv, Ivano-Frankivsk and Vinnytsia regions were targeted.

Some 350 rescuers raced to minimize the damage to energy facilities, 30 homes, public transport vehicles, cars and a fire station, the interior ministry said.

National power grid operator Ukrenergo said it was forced to introduce electricity cuts in nine regions for consumers and that it would expand them nationwide for businesses during peak evening hours until 11 p.m.

Ukrenergo CEO Volodymyr Kudrytskyi, interviewed by the Ukrainska Pravda media outlet, said electricity imports would not make up for power shortages. He said hydropower stations had also been hit, clarifying an earlier company statement omitting hydro stations from the list of affected facilities.

Russia's defence ministry said it struck Ukraine's military-industrial complex and energy facilities in retaliation for Kyiv's strikes on Russian energy facilities.

WWII anniversary

President Volodymyr Zelenskyy noted the attacks were launched on the day Ukraine marks the end of World War II.

"This is how the Kremlin marks the end of World War II in Europe, with a massive strike, attempting to disrupt the lives of our people with its Nazism," he said in his nightly video address.

In an earlier online address, Zelenskyy singled out what he said was the West's limited progress in curbing Russian energy revenue and some countries that attended President Vladimir Putin's inauguration for a fifth term in the Kremlin on Tuesday.

Fighting Nazism back then, he said, was "when humanity unites, opposes Hitler, instead of buying his oil and coming to his inauguration."

Convicts to serve

Ukraine's parliament passed a bill Wednesday that will allow some convicts to serve in the military in exchange for the possibility of parole at the end of their service, a move aimed at replenishing the army's depleted ranks after more than two years of war.

The bill must still be signed into law by Zelenskyy. It was not immediately clear if he would do so, given the sensitivity of the matter.

The policy echoes a practice used by Russia, which has committed tens of thousands of convicts to the war, allowing it to gain the upper hand in bloody assaults by sheer force of numbers. While Russia has enlisted all manner of prisoners, the Ukrainian bill says that those convicted of premeditated murder, rape or other serious offenses will not be eligible — although some lawmakers said involuntary manslaughter convictions could be considered.

The New York Times contributed to this report.

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Johnson survives Greene's ouster attempt

Catie Edmondson, Carl Hulse and Kayla Guo
THE NEW YORK TIMES

KENNY HOLSTON / THE NEW YORK TIMES

Rep. Marjorie Taylor Greene (R-Ga.) speaks to reporters outside the Capitol in Washington, D.C., after attempting to oust House Speaker Mike Johnson (R-La.) from his post on Wednesday, May 8, 2024.

WASHINGTON, D.C. — Speaker Mike Johnson on Wednesday easily batted down an attempt by Rep. Marjorie Taylor Greene of Georgia to oust him from his post, after Democrats linked arms with most Republicans to fend off a second attempt by GOP hard-liners to strip the gavel from their party leader.

The vote to kill the effort was an overwhelming 359-43, with seven voting "present." Democrats flocked to Johnson's rescue, with all but 39 of them voting with Republicans to block the effort to oust him.

Members of the minority party in the House have never propped up the other party's speaker, and when the last Republican to hold the post, Kevin McCarthy, faced a removal vote last fall, Democrats voted en masse to allow the motion to move forward and then to jettison him, helping lead to his historic ouster.

This time, the Democratic support made the critical difference, allowing Johnson, who has a minuscule majority, to avoid a removal vote altogether. While for weeks Greene had appeared to be on a political island in her drive to get rid of yet another GOP speaker, 11 Republicans ultimately voted to allow her motion to move forward.

That was the same number of Republicans who voted in October to allow the bid to remove McCarthy to advance — but back then, they were joined by every Democrat.

"I appreciate the show of confidence from my colleagues to defeat this misguided effort," Johnson told reporters shortly after Wednesday's vote.

"As I've said from the beginning and I've made clear here every day, I intend to do my job. I intend to do what I believe to be the right thing, which is what I was elected to do, and I'll let the chips fall where they may. In my view, that is leadership."

"Hopefully," he added, "this is the end of the personality politics and the frivolous character assassination that has defined the 118th Congress."

The lopsided vote solidified the dynamic that has defined Johnson's speakership, like McCarthy's before him: Each time the Republican leader has been faced with a critical task, such as averting a government shutdown or a catastrophic default on the nation's debt, he has relied on a bipartisan coalition of mainstream lawmakers to steer around far-right opposition and provide the votes to accomplish it.

The result has been the empowerment of Democrats at the expense of the hard right, the very phenomenon that Greene raged against as she rose on the House floor Wednesday — drawing boos from some of her colleagues — to lay out a scathing case against Johnson and what she called the "uniparty" he empowered.

"Our decision to stop Marjorie Taylor Greene from plunging the House of Representatives and the country into further chaos is rooted in our commitment to solve problems for everyday Americans in a bipartisan manner," Rep. Hakeem Jeffries of New York, the Democratic leader, told reporters shortly after the vote. "We will continue to govern in a reasonable, responsible and results-oriented fashion, and put people over politics all day and every day."

Greene's move to oust Johnson came roughly three weeks after the speaker pushed through a long-stalled $95 billion national security spending package to aid Israel, Ukraine and other U.S. allies over the objections of Greene and other right-wing Republicans who staunchly opposed sending additional aid to Ukraine.

Lawmakers loudly jeered Greene as she called up the resolution and read it aloud. As she recited the measure, a screed that lasted more than 10 minutes, Republicans lined up on the House floor to shake Johnson's hand and pat him on the back.

"Given a choice between advancing Republican priorities or allying with Democrats to preserve his own personal power, Johnson regularly chooses to ally himself with Democrats," Greene said, reading from her resolution.

She concluded with the official call for his removal: "Now, therefore be it resolved that the office of the speaker of the House of Representatives is hereby declared to be vacant."

It marked the second time in less than a year that Republicans have sought to depose their own speaker, coming about seven months after GOP rebels succeeded, with Democratic support, in removing McCarthy.

Earlier in the week, Greene had seemed to hesitate over whether she would actually call the ouster vote. For two consecutive days, she met for hours with Johnson, flanked by her chief ally, Rep. Thomas Massie of Kentucky, and floated a list of demands in exchange for not calling the vote.

Among the demands were cutting off all future U.S. aid to Ukraine, defunding the Justice Department and imposing a 1% across the board cut on all spending bills if lawmakers are unable to negotiate a deal to fund the government in September.

But Johnson had remained cool to their entreaties, and told reporters that he was not negotiating with Greene and Massie.

That put Greene, whose combative political brand is premised on her unrelenting appetite to fight with the establishment of her party, out on a limb.

She had little choice but to call up a vote she knew would fail, but had been threatening for weeks. Even after Jeffries made it clear that Democrats would vote to block any ouster attempt, she was still determined to undermine Johnson publicly and force Democrats to bail him out.

"This is exactly what the American people needed to see," she told reporters on the House steps after the vote. "I didn't run for Congress to come up here and join the uniparty, and the uniparty was on full display today."

"The Democrats now control Speaker Johnson," she added.

Just 32 Democrats voted to allow Greene's motion to move forward, while another seven voted "present," registering no position.

Greene initially filed the motion against Johnson in late March, just as lawmakers were voting on a $1.2 trillion spending bill he pushed through the House over the opposition of the majority of Republicans. She called the move a "betrayal" and said she wanted to send the speaker a "warning," then left the threat dangling for weeks.

Johnson plowed ahead anyway, putting together an aid package for Ukraine — a move Greene previously said was a red line that would prompt her to seek his ouster, but which did not lead her to immediately make good on her threat.

"I'm actually going to let my colleagues go home and hear from their constituents," Greene said following the vote, predicting that Republicans would join her bid to get rid of Johnson after getting an earful from voters irate about the foreign aid bill. Instead, many of them heard just the opposite and returned to Washington voicing skepticism about removing Johnson.

If she had been successful Wednesday, Greene would have prompted only the second vote on the House floor in more than 100 years on whether to oust the speaker.

When Rep. Matt Gaetz of Florida instigated McCarthy's removal in October, such a spectacle had not been seen in the chamber since 1910.

But this time, Greene had a more difficult time finding support for removing the speaker.

House Republicans were wary of throwing the chamber into another period of chaos like the one that paralyzed the House for weeks after McCarthy's ouster, and have privately seethed about the public disarray Greene's threat has sown.

Even ultraconservatives like Gaetz expressed uneasiness with firing another speaker, suggesting that the move risked handing over control of the House to Democrats given Republicans' rapidly narrowing margin of control.

Former President Donald Trump also came to Johnson's defense, urging Republicans on social media minutes after the vote to kill Greene's effort, arguing that polling showed Republicans doing well in the November elections, and that a show of division would undermine the party.

"If we show DISUNITY, which will be portrayed as CHAOS, it will negatively affect everything!" he wrote.

He called Johnson "a good man who is trying very hard," but did not slam the door altogether on the idea of removing him.

"We're not in a position" to do so now, with such a small Republican majority in the House, Trump wrote. "At some point, we may very well be, but this is not the time."

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U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park
Geophysical Observatory Real Estate Environmental Impact Statement

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawai'i for the Pacific Missile Range Facility (PMRF) and the Kōke'e Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in the environmental planning process.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawai'i lands on Kaua'i for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawai'i land on Kaua'i for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

The Navy and NASA will host public scoping meetings at three locations on Kaua'i. Attend any of the public **scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this** planning process. Meetings will be held from 5 to 8 p.m. HST at the following locations:

PUBLIC SCOPING MEETINGS

Tuesday, June 4, 2024	Wednesday, June 5, 2024	Thursday, June 6, 2024
Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Lihu'e	Kekaha Neighborhood Center 8130 Elepaio Road, Kekaha	Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.	Project presentation by Navy and NASA.

The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawai'i Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

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For more information visit PMRF-KPGO-EIS.com

Around the world

General Assembly to back Palestinian membership

UNITED NATIONS >> The United Nations General Assembly today is set to back a Palestinian bid to become a full U.N. member by recognizing it as qualified to join and sending the application back to the U.N. Security Council to "reconsider the matter favorably."

The Palestinians are reviving their bid to become a full U.N. member — a move that would effectively recognize a Palestinian state — after the U.S. vetoed it in April in the 15-member U.N. Security Council.

Japan to allow commercial hunting of large fin whales

TOKYO >> Japan will add large fin whales to its list of commercial whaling species, government spokesperson Yoshimasa Hayashi said Thursday, five years after leaving an international body that regulates the commercial hunt of the marine mammals.

Japan resumed commercial whaling in its territorial waters and exclusive economic zones in 2019, after withdrawing from the International Whaling Commission.

This week its Fisheries Agency sought public comment on a draft revision of its aquatic resource control policies that would allow commercial catching of fin whales. "Whales are important food resources and should be sustainably utilized, based on scientific evidence," said Hayashi, the chief cabinet secretary, referring to widening the allowable catch to include fin whales.

Camera footage released of police killing Black airman

Under mounting pressure to offer a justification for the fatal police shooting of a U.S. Air Force senior airman in his apartment last week, a Florida sheriff Thursday released body camera footage of the deadly encounter.

The footage shows Senior Airman Roger Fortson, 23, answering the door of his apartment in the Florida Panhandle and immediately being shot by a deputy from the Okaloosa County Sheriff's Office. The video also shows that Fortson was holding a gun, and authorities have maintained that the deputy "reacted in self-defense."

The release of the footage came amid growing questions from the airman's family and their lawyers who had accused the deputy of entering the wrong apartment, of not knocking or announcing himself and of bursting through the door.

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Justices rule against women whose cars were confiscated

By Adam Liptak
New York Times

NEW YORK TIMES / APRIL 16

By a 6-3 vote Thursday, the Supreme Court ruled that innocent owners of cars seized by police are not entitled to an immediate hearing to reclaim their vehicles.

WASHINGTON >> The Supreme Court on Thursday made it harder for people whose property had been seized by police to argue for its swift return.

By a 6-3 vote, the court ruled against two Alabama women who had sought prompt hearings to recover cars they owned that had been taken by police in connection with crimes committed by others.

"After a state seizes and seeks civil forfeiture of personal property, due process requires a timely forfeiture hearing but does not require a separate preliminary hearing," Justice Brett Kavanaugh wrote for the majority.

In dissent, Justice Sonia Sotomayor said the majority had adopted a wooden approach to a pressing problem.

"The majority today holds that due process never requires the minimal check of a retention hearing before a police officer deprives an innocent owner of her car for months or years," Sotomayor wrote.

Even as the court rejected the women's argument that the Constitution requires streamlined procedures, five justices expressed grave misgivings about the practice of confiscating property said to have been used to commit crimes, known as civil asset forfeiture.

The court ruled in two cases. One of them started after Halima Culley bought a 2015 Nissan Altima for her son to use at college. He was pulled over by police in 2019 and arrested when they found cannabis. They also seized Culley's car.

That same year, Lena Sutton lent her 2012 Chevrolet Sonic to a friend. He was stopped for speeding and arrested after police found methamphetamine. Sutton's car was also seized.

Alabama law in effect at the time let so-called innocent owners reclaim seized property, and both women ultimately persuaded judges to return their cars. It took more than a year in each case, though there was some dispute about whether the women could have done more to hasten the process.

Culley and Sutton filed class actions in federal court saying they should have been afforded prompt interim hearings to argue for the return of the vehicles while their cases moved forward. Lower courts ruled against them.

Kavanaugh wrote that the Constitution's due process clause does not require the preliminary hearing the women sought.

"Culley and Sutton's argument for a separate preliminary hearing appears in many respects to be a backdoor argument for a more timely hearing so that a property owner with a good defense against forfeiture can recover her property more quickly," he wrote. "But the court's precedents already require a timely hearing."

Alabama has since amended its forfeiture law to allow owners of seized property to request expedited hearings.

"Our decision today does not preclude those legislatively prescribed innovations," Kavanaugh wrote. "Rather, our decision simply addresses the baseline protection of the due process clause."

Chief Justice John Roberts and Justices Clarence Thomas, Samuel Alito, Neil Gorsuch and Amy Coney Barrett joined the majority opinion.

Ukraine attacks Russian oil facilities

By Constant Meheut
New York Times

KYIV, UKRAINE >> Ukrainian drones struck two oil depots and a refinery across Russia in a 24-hour period, including one deep in Russian territory, officials on both sides said Thursday, as Kyiv presses a campaign aimed at hampering the country's military operations and putting strain on its most important industry.

Radiy Khabirov, head of Russia's Bashkiria region, near Kazakhstan, said a drone hit the Neftekhim Salavat oil refinery, one of the country's largest, around midday Thursday, sending plumes of smoke into the sky. The facility is more than 700 miles from the Ukrainian border, in a sign that Ukraine is increasingly capable of striking farther into Russia.

An official from Ukraine's special services, speaking on condition of anonymity to discuss sensitive military matters, said Ukraine was behind the assault. The official said Ukraine was also responsible for two other drone strikes overnight that hit oil depots in Russia's Krasnodar region, southeast of Ukraine.

The strikes follow some 20 similar attacks since the beginning of the year. Military analysts say they are an attempt by Ukraine to disrupt the Russian military's logistical routes and combat operations by targeting the facilities that supply fuel for its tanks, ships and planes.

Ukrainian officials also hope the strikes can undermine the Russian energy complex, which is at the core of the country's economy and war effort — accounting for about one-third of Russia's federal budget revenue — although it is too early to say whether they can have any serious impact.

The U.S. government has publicly urged Ukraine to stop its attacks on Russian oil refineries out of concern that they could affect global oil markets.

But Ukraine has instead doubled down on its strategy. In April, Ukraine struck Russia's third-largest refinery, about 800 miles from its border with Russia. The refinery hit Thursday is also one of Russia's biggest, with a capacity to process 10 million metric tons of oil a year, according to Gazprom, its owner.

Ukraine's rationale for these attacks appears to be that by disrupting Russian military logistics, it could buy time for Ukrainian troops on the battlefield, who are outnumbered, undergunned and steadily losing ground to Russian forces.

In recent months Ukraine has increasingly relied on asymmetrical tactics to disrupt Russian operations, including sabotage activities against railway infrastructure and ammunition depots.

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In Budapest, China's Xi hails ties with Hungary

By Andrew Higgins
New York Times

WARSAW, POLAND >> Chinese President Xi Jinping on Thursday found another safe zone in a continent increasingly wary of his country, meeting in Budapest with Hungarian Prime Minister Viktor Orban, the European Union's perennial odd man out as a vocal supporter of warm relations with both China and Russia.

As happened at his previous stop in Serbia, Xi received a red-carpet welcome and was spared from protesters.

After their talks Thursday ended, Xi and Orban held what was billed as a news conference, but it consisted of their reading statements without taking questions, a format preferred by the Chinese leader.

They pledged to elevate already-friendly relations to an "all-weather comprehensive strategic partnership" — a sharp divergence from the view of China held by the European Union, of which Hungary is a member, as "a partner for cooperation, an economic competitor and a systemic rival."

Orban, under fire from many fellow European leaders for pushing what he calls a "policy of peace" in Ukraine — effectively a demand that its president, Volodymyr Zelenskyy, capitulate to avoid further bloodshed — offered "special thanks" to Xi for "the steps that the People's Republic of China is taking to create peace."

China has declined to condemn Russia's full-scale invasion of Ukraine and, according to the United States, has helped Russia's military continue its assault on Ukrainian territory by providing satellite imagery to Russian forces, along with jet fighter parts, microchips and other dual-use equipment.

"Our voice, the voice of Hungary, is a lonely voice in Europe. Today, Europe is on the side of war. The only exception is Hungary, which calls for an immediate cease-fire and peace negotiations," Orban said, applauding China's own vague peace plan, announced in 2023.

With nothing to announce on Ukraine beyond calls for peace, Hungary and China focused on economic cooperation. The Hungarian foreign minister, Peter Szijjarto, announced 18 joint projects, including a high-speed railway to the international airport from downtown Budapest and a new rail line across the country to transport electric cars, batteries and other products from Chinese factories planned for eastern Hungary to European markets in the West. They also agreed to cooperate on nuclear energy projects.

obituaries

H. Wallace 'Wally' Jaynes

1935-2024

A very good son, brother, a wonderful husband, a proud and loving dad, grand dad, great granddad and a strong, true and forever friend. A man who loved and respected God and country. Best not forget a kind and loving friend of animals.

Jaynes

Wally lived his life learning and doing what needed to be done and willingly facing whatever challenges life presented. A man of many interests, Wally loved working, diving, flying, reading and music; played guitar, bongos and keyboard. Wally started his early working career in the logging industry of Northern California, by the age of 19, he owned his own log hauling truck. He often worked two and sometimes three jobs while raising a family: his boys Kenny, Steve and Dean. Wally was a master carpenter, a builder and a contractor. Living in the Laguna Beach area was a major part of his life, he was naturally a water enthusiast and took up diving with his friends long before diving became such a popular sport. Diving and construction transitioned him to underwater construction and owning his own underwater construction company, Orca Divers in Laguna Beach. While working in that field he became an explosives expert and handled the explosives work required to build out the Dana Point Harbor and other projects along the So. California coast.

Strangely enough this led to Wally starting a career in photography. When underwater photos were needed for a 3-mile underwater pipeline job, he rented an underwater camera and successfully (with 15 minutes of instructions from the camera store owner) took the photos requested along with the doing the mechanical drawings he always provided for the job. (Wally's mom, Virginia was a wonderful artist who worked for Walt Disney and Walter Lantz back in the day, and his brother Ken was a Military man who taught him mechanical drawing.) From that experience Wally enrolled in So. Coast College to study photography, soon to open his own rental darkroom. The Darkroom soon became a Laguna Beach icon of some 35 years, darkroom, camera store, custom printing, studio, wedding and event photography, videography, postproduction, etc.

Wally was a man of many interests and skills. He designed, drew plans and built two homes for us and was a skilled furniture and cabinet maker.

At the age of 44 he met and soon married his wife Doris, then adding two teenage boys to his family. David and John Estrada became his boys, and they were blessed to have him as a father and friend.

Wally should have written a book. He had a great memory of his many adventures and could tell story after story.

Wally was a patriot at heart. Wally's love of the country was best expressed in his love of and 40 plus years as a volunteer with the Air Force Auxiliary, Civil Air Patrol. He loved the challenge of flying search and rescue missions, and among those missions his best moment was when finding a crash site with the plane crew alive and waiting for rescue (most 'finds' don't have such happy endings). He is ending his career with Civil Air Patrol as Lt. Colonel with many years as Safety Officer in both California and here in Hawai'i.

Wally would say the best part of life was being a friend and helping others. That is what really sums up his life. And of course, being the best husband and father ever. Love you forever.

A Celebration of his Life will be held on Thursday May 16, 2024, at St. Catherine's Church with visitation beginning 8:30 a.m., funeral mass beginning at 10 a.m. and burial to follow at St. Catherine's Kealia Cemetery.

In lieu of flowers the family requests donations be made to Kaua'i Hospice in memory of Wally Jaynes.

Kaua'i Memorial Gardens and St. Catherine's Church assisted the family with arrangements.

Michael Miyuki Cardinez

Michael Miyuki Cardinez, known for his ready smile and servant heart, peacefully left for Paradise on Feb. 28, 2024. He was an active member in the Kaua'i Church of Christ, Lihu'e. Michael was born in Waimea, Kaua'i, on Aug. 13, 1949. He served in the United States Navy for four years before becoming a Radar Technician at Makaha Ridge, Koke'e from where he retired.

Michael was preceded in passing by his father Steven Cardinez, mother Evelyn (Oyakawa) Estrada, brother Ronald Cardinez, sister Lydia Castillo, brother-in-law David Banquel and the mother of his children, Monda Haney.

He is survived by his brothers Clarence (Carmen) Cardinez of California, Manolo (Ces) Delos Reyes of Kaumakani, James (Angela) Delos Reyes of Kaumakani, Steven (Karen) Cardinez of Florida, Alex (Shari) Cardinez of California, sisters Frances Bunao of Lihu'e, Carol (Burt) Gonsalves of California, Alicia Estrada of Hanama'ulu, Celia Marie Mancia of Oregon, Nelda Banquel of Hanapepe and his stepmother Evelyn "Nana" Cardinez of Kaumakani (who sadly passed on March 14, 2024).

Michael also leaves behind his children Kalei (Alden) Cardinez of Hanama'ulu, Kananiokala (Harvey) Makekau of Hanama'ulu, Mikey (Carolan) Cardinez of Kapa'a and TC (Andrea) Cardinez of Wailua. He will remain a constant guide to his beloved grandchildren Cobie Cardinez, Megan Rego, Keona Nakamura, Kaiona Nakamura, Ricky Rego, Nainoa Cardinez, Auree Cardinez, Daniel Makekau and Sherilyn Makekau as well as his most precious great grandchildren Taiden Cardinez, Tia Cardinez, Kawehi Rego and Kamaielauli'i Yap and his grand pups Hale, Nani, Pepe, Mali'e, Li'i, Hema and Lilo. Michael is also survived by numerous cousins, nieces and nephews.

A celebration of his life will be held on Tuesday, May 28, 2024, at the Kaua'i War Memorial Convention Hall, starting at 11:30 am. The family requests casual attire and welcomes flowers. Please come, talk story and enjoy heavy pupu and desserts with his 'Ohana.

Borthwick Kaua'i Mortuary assisted the 'Ohana with arrangements.

Francisco 'Cisco' Campos Jr.

Francisco "Cisco" Campos Jr. passed away on Monday, April 29, 2024, at Straub Medical Center in Honolulu, at the age of 76 years old. He was born on March 27, 1948, in Waimea, Kaua'i.

Campos

He was a veteran of the U.S. Air Force who served in the Vietnam War. He worked for the County of Kauai Public Works Department Solid Waste Division for over 20 years and then retired as a baggage supervisor for United Airlines in 2016.

He is survived by his five daughters Tasha (Tommy) Stetter of Illinois, Leanna Campos (Rueben Games) of Waimea, Leilani Campos of Honolulu, Laola Campos (Chad Ishida) of Waimea, Noe Campos (Kawai Rapozo) of Waimea, grandchildren Jacey (Mana) Alquiza, Drayden, Jaycob, Daylen (Brennan) Ferrara, Pomai, Malu, Ezekiel, Ezra, Ivory, Kayce, great-grandchildren Kayzee-Marie, Tyson, Taelyn-Marie, Kaine, Irie Reign, sister Fely Dement of Hanapepe, numerous uncles, aunts, nieces, nephews and cousins.

A service will be held on Sunday, May 12, 2024, at the Garden Island Mortuary in Lawa'i, beginning at 2 p.m., and burial will be on Monday, May 13, 2024, at 11 a.m. at Kaua'i Veterans Cemetery in Hanapepe. The family suggests casual attire and requests that flowers be omitted.

Garden Island Mortuary assisted family with arrangements.

births

- Rachel Medeiros and Stephen Emayo greeted their daughter, Selena Evangeline Emayo, weighing 7 pounds, on March 14, 2024, at Kauai Veterans Memorial Hospital.
- Kaleigh and Nathan Smith greeted their daughter, Emma Nanea Smith, weighing 7 pounds, 11 ounces, on March 2, 2024, at Kauai Veterans Memorial Hospital.
- Dennis Erakdrik and Raini Henry-Erakdrik greeted their fifth child, a girls, Skylar Bethany Erakdrik, weighing 7 pounds, 3.9 ounces, on March 3, 2024, at Wilcox Medical Center.
- Naomi and Riley Harrington greeted their third child, a boy, Niall Nainoa Ryohei Harrington, weighing 7 pounds, 14 ounces, on March 4, 2024, at Wilcox Medical Center. Mrs. Harrington is the former Naomi Taylor.
- Melissa Vega-Guerpo and Romeo Guerpo greeted their son, Aven Guerpo, weighing 8 pounds, 7 ounces, on March 6, 2024, at Kauai Veterans Memorial Hospital.
- Stevie and Heather Sokei-Lutz greeted their fourth child, a boy, Huxley Kaito Itsuo Sokei-Lutz, weighing 8 pounds, 5 ounces, on March 7, 2024, at Wilcox Medical Center.
- Anais Werkmeister-Baumann and Ka'imi Hermosura greeted their son, Kekela Hermosura-Werkmeister, weighing 7 pounds, 4 ounces, on March 8, 2024, at Kauai Veterans Memorial Hospital.

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U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park
Geophysical Observatory Real Estate Environmental Impact Statement

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For more information visit PMRF-KPGO-EIS.com

NEWS OF THE WEIRD

Brown Bear, Brown Bear And 2 Driving Fools

A Scottish woman, Moira Gallacher, 72, and her friend, Charmian Widdowson, were touring Romania in April, enjoying a drive through the Carpathian Mountains, *People* reported. They happened upon two brown bears and stopped to get a picture with them. Then, Widdowson pulled up to the bear for another photo-op.

"I rolled down the window; I thought he wanted to be friends," Widdowson told STV News. "He started getting into the car and bit my friend."

She said she thought the bear approached because he heard the women talking about getting something to eat.

"I think he … decided he had to eat my friend."

Gallacher was wearing a thick jacket with two layers underneath; although the bear clamped down on her hand with its jaws, she escaped with minor wounds.

In other Weird happenings:

Shopping Cart Spree

On April 9, investigators caught their targets in a puzzling money-making scheme in Rochelle Park, New Jersey.

SEE PAGE 7

How These Bandits Roll
ILLUSTRATION BY MARK GALACGAC

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S·EVENTFUL

A SUNRISE TO SUNSET LOOK AT SOME OF THE BIGGEST EVENTS ON KAUA'I

EMAIL APANG@MIDWEEK.COM

1 JUNE

MUSIC CONCERT

Ebb & Flow Arts presents Duo Diorama, featuring violinist Minghuan Xu and pianist Winston Choi, at St. Michaels All Angels Episcopal Church in Līhu'e. The concert will also feature works by Béla Bartók, Alfred Schnittke, Dmitri Shostakovich, John Corigliano, Augusta Read Thomas and Robert Pollock. Admission is free.

Saturday, June 1, 7 p.m.
For more info, visit ebbandflowarts.org

2 JUNE

FOOD FESTIVAL

Enjoy dishes prepared by more than 25 island chefs, various musical entertainment groups and more at Taste of Hawai'i at Smith's Tropical Garden in Kapa'a. Gate admission is $200 and advance tickets on eventbrite.com are $165.

Sunday, June 2, 11:30 a.m.-3:30 p.m.
Purchase tickets at eventbrite.com (search "Taste of Hawaii is the ultimate Sunday Brunch by Rotary Club of Kapaa")

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JUNE 1

PRIDE PARADE

A Pride Parade to kick off Pride Month starts on Rice Street at Vidinha Stadium and ends at Historic County Lawn, where there will be a festival following the parade. Expect food trucks, small business and craft vendors, community resources, and live entertainment.

Saturday, June 1, 9 a.m.-2 p.m.
For more info, visit kauaiprideparade.com

PHOTO COURTESY AARON FEINBERG

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Serial criminal can keep $12.5M settlement

Peter Boylan
STAR-ADVERTISER

HONOLULU — The 38-year-old man awarded $12.5 million after he sued the city following injuries suffered in a 2021 police pursuit appeared in court Wednesday to face federal charges that he used a ghost gun while selling methamphetamine in Waianae.

It is the second time Jonaven Perkins-Sinapati was arrested on drug and gun charges this month.

Despite the criminal charges, there is no chance the city can recoup any of the $12.5 million awarded Perkins-Sinapati in the civil case.

"The City's settlement agreements are generally not contingent upon future conduct but are intended to compensate plaintiffs for verifiable damages resulting from negligent acts of the City or its employees and/or to resolve cases in the best interests of the City," according to a statement to the Honolulu Star-Advertiser from Scott Humber, Mayor Rick Blangiardi's communications director. "The Perkins-Sinapati settlement agreement did not include a contingency provision for future criminal conduct."

Perkins-Sinapati, a convicted felon with more than 40 arrests and citations, was charged by criminal complaint Saturday with possession with intent to distribute 50 grams or more of a mixture or substance containing a detectable amount of methamphetamine and possessing a firearm in furtherance of a drug trafficking crime, according to federal court records.

A hearing on the U.S. Department of Justice's motion to detain Perkins-Sinapati without bail until trial is scheduled for June 4 before U.S. Magistrate Judge Rom A. Trader.

Among the reasons cited by the government that Perkins-Sinapati should be held without bail is that he is a danger to the community, a flight risk and "the alleged offenses were "committed on release pending felony trial," according to the motion authored by Assistant U.S. Attorney Barbara Eucker.

Perkins-Sinapati's attorney, Michael Green, did not immediately return a Star- Advertiser request from comment.

A preliminary hearing on the federal charges is scheduled for Sept. 9 in Trader's court.

On May 23, the Honolulu Police Department got an anonymous tip that Perkins-Sinapati was operating a black Jaguar sport utility vehicle and was wanted on an outstanding state warrant with a bail amount of $1 million, according to a federal criminal complaint.

Perkins-Sinapati was previously charged in state court May 7 with several firearm and ammunition offenses, third-degree promotion of a dangerous drug, and second-degree reckless endangering.

He is scheduled for an arraignment and plea in that case on Monday at 8:30 a.m. At this time there is no court determination deferring one prosecution until resolution of the other.

On May 23, an HPD officer saw the black Jaguar SUV and witnessed a passenger throw a dark bag out of the window.

The officer recovered the bag and allegedly found 108 grams of methamphetamine.

In the bag, the officer also allegedly found a loaded, homemade 9mm pistol, "bearing no manufacturer number nor serial number," 14 rounds of 9mm Luger ammunition, and four rounds of 40-caliber Smith and Wesson Hornady ammunition.

HPD pulled Perkins-Sinapati over at the intersection of Farrington Highway and Lualualei Homestead Road.

The officer saw ammunition in the cup holder of the Jaguar. HPD arrested him and his passenger on suspicion of multiple state gun charges.

A fanny pack found in the car allegedly had 48 grams of methamphetamine in it.

Perkins-Sinapati faces enhanced penalties if convicted in state court because he has prior felony convictions for car theft, robbery and promotion of a dangerous drug.

On May 4 at about 1:13 p.m., Perkins-Sinapati allegedly fired a gun in a residential area near Ewa Makai Middle School.

The city agreed to pay $12.5 million to Perkins-Sinapati, the driver of a car that crashed on Sept 12, 2021, in Makaha during a pursuit by Honolulu police officers who allegedly left the scene, only to return and pretend they were not involved in the pursuit.

Three Honolulu Police Department officers are awaiting trial for allegedly causing the high-speed chase and crash and covering it up.

Officers Joshua J.S. Nahulu, 37, Erik X.K. Smith, 25, and Jake R.T. Bartolome, 35, were fired by the department in February. A fourth officer, Robert G. Lewis III, whose age was not released, also faces criminal charges in connection with the crash and cover-up.

All four entered not-guilty pleas on March 23, 2023, and go to trial Oct. 7. June 3.

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obituaries

Brian S. Kubota

Memorial services for Brian S. Kubota will be at Immanuel Lutheran Church at 3 p.m. on Friday, May 31, 2024. Brian died Sunday, May 19, 2024. He will be laid to rest at Oak Hill Cemetery in Lawrence, Kansas.

Kubota

Brian Shigeo Kubota was born in Waimea, Kaua'i, Hawai'i, on March 16, 1943, to Shigeomi and Bernice Aiko (Hamamura) Kubota. He attended Koloa Grammar School and Kaua'i High School in Lihu'e, Hawai'i. He graduated from Iowa State University, Ames, Iowa, with a degree in Landscape Architecture and Urban and Regional Planning. He married Virginia (Ginny) Gutz on April 29, 1967. In addition to his wife, he is survived by his children: Vicki, Chicago, Illinois, and Jeff, Lawrence, Kansas. Also surviving are siblings: Adele (Don) Stevens, Honolulu, Hawai'i; Louella Rita, Makawao, Maui, Hawai'i; Sue Kubota, Honolulu, Hawai'i; and Burt (Debra) Kubota, Koloa, Kaua'i, Hawai'i. He was also Uncle to eight nieces and nephews.

After graduating from Iowa State University, Brian was employed by Howard, Needles, Tammen & Bergendoff from 1966-1969. He then moved to Lawrence, Kansas, and worked for the city as the Assistant Planning Director. In 1970 he joined the partnership of Robertson, Peters, Erickson, and Williams and also worked as Assistant Professor of Architecture from 1972-1973. In 1978 he established Landplan Engineering, a branch of Peters, Kubota, Glenn. Some of Brian's well-known urban design projects are Downtown Lawrence, Maupintour Travel Service (International Headquarters Building), Lawrence City Hall, Alvamar Country Club, Broken Arrow and South Junior High Schools, Lawrence Public Library and Trailridge Apartments. Alvamar West Golf Course, Orchards Golf Course, Holcomb Park and Buford M Watson, Jr. Park are additional site plans he designed. Brian won awards for Maupintour, Lawrence Town Center, Lawrence City Hall, and the Federal Office Building, Topeka, Kansas.

Brian served as National President and Vice President of ASLA (American Society of Landscape Architects) and many boards and task forces throughout the years. He also served as ASLA Prairie Gateway Chapter trustee for several terms. He attained Fellowship status in ASLA due to his contributions, professional accomplishments, attitude, and character. He was President of the Boys' Club, Board Member of the Lawrence Chamber of Commerce, and Building Committee Member/Consultant of Immanuel Lutheran Church. He was also a Consultant for Corpus Christi Catholic Church and St. Lawrence Catholic Center.

After retiring from Landplan Engineering, he developed The Villas, one of Lawrence's first empty-nester, single-family home developments and The Cove, a townhouse empty-nester development. He's been a consultant for numerous developers throughout his career.

Brian and Ginny spent many winters in Naples, Florida. He also loved to golf and enjoyed trips on his Harley-Davidson motorcycle. Many family vacations were spent with relatives in Hawai'i and exploring other parts of the country. A little-known fact about Brian is that he enjoyed singing karaoke.

In lieu of flowers, the family suggests memorials to Immanuel Lutheran Church, 2104 Bob Billings Pkwy, Lawrence, KS 66049 or Visiting Nurses of Douglas County, P.O. Box 1260. Lawrence, KS 66044.

Online condolences made at rumsey-yost.com

Rev. Dr. Harold 'Doc' Itsuo Ayabe

Rev. Dr. Harold "Doc" Itsuo Ayabe, 89, of Kaneohe, former pastor of Windward Missionary Church and retired Department Chair and Professor Emeritus of Educational Psychology at the University of Hawai'i Manoa, went home to be with his Lord and Savior, Jesus Christ, on May 14, 2024. Doc was born on Dec. 29, 1934, in Lawa'i, Kaua'i, Hawai'i.

Ayabe

He is survived by daughter Rev. Dr. Sharon Ayabe, brother Tadashi Jerry, sister Kikumi Kay Harada, sisters-in-law Edna Holdeman, Gloria Young, Thelma Chikuma, Lillian Nishihara, hanai granddaughter Dr. Corrie Yoshimura Fang, numerous nieces and nephews.

He was preceded in death by his wife, the love of his life, Ann Satoko (Nishihara) Ayabe, daughter Dr. Cheryl Emiko Milanio, parents Shohachi and Kikuo (Nagano) Ayabe, older brothers Katsumi, Keiso Henry, Noboru and older sister Hitoe Hirano.

A Celebration of Life memorial service will be held at Kalihi Union Church Main Sanctuary, 2214 N King Street, Honolulu, Hawai'i on Wednesday, June 5, 2024. Visitation at noon. Services at 1 p.m.

Arrangements provided by Hosoi Garden Mortuary. Flowers by Beretania Florist.

Michael Manzano Abigania

Michael Manzano Abigania, of Mission Viejo, California, loving husband, father, grandfather, brother, and friend, went to be with the Lord on Sunday, March 17, 2024. He was born in Vigan, Ilocos Sur, Philippines on June 8, 1952.

Michael is survived by his wife, Arminda Pascual Abigania; daughters, Sherry (Franklin Jr.) Matthews, Michelle (Victor) Abigania-Libunao, Melany (Eric) Abigania-Chun; grandchildren, Makana, Kainani Libunao, Malia, Micah, Jacob, Jade Matthews; brothers, Louis (Edith) Abigania, Robert (Doris) Abigania, Richard (Tess) Abigania, Glenn (Sharon) Abigania, Reynold Abigania; sisters, Nancy Abigania, Vicky Abigania, Christine (Bernard Sr.) Mabini, Alice (Reggie) Hunt, and Brenda (Ho-Tai) Zerba.

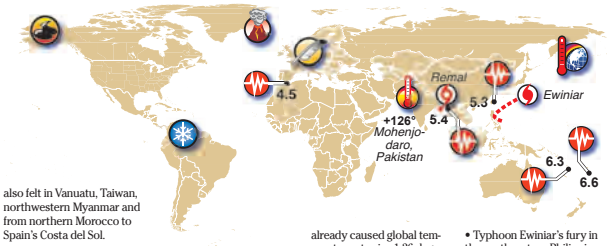
Michael was preceded in death by his parents Rufo and Mary Abigania and sister Cynthia Dela Cruz.

Family and friends are invited to a Celebration of Life on Saturday, June 8, at St. John's Episcopal Church located in Ele'ele, at 10 a.m. Casual attire is requested.

EARTHWEEK: DIARY OF A CHANGING WORLD

For week ending Friday

By Steve Newman



Orange rivers

Scientists say melting permafrost is likely turning dozens of Alaskan rivers and streams an orange color. The new rusty hue is believed to be caused by minerals once frozen in the soil now flushing into previously crystal-clear waterways. Researchers from the U.S. Geological Survey, the National Park Service and the University of California, Davis, say the degraded rivers and streams could have significant implications for drinking water and fisheries in Arctic watersheds. "We (now) see a lot of different types of metals in these waters," said researcher Taylor Evinge. "One of the most dominant metals is iron. That's what is causing the color change."

Earthquakes

The Tongan capital and other low-lying areas were evacuated due to fears of a tsunami following a massive undersea temblor that rocked the island nation.

• Earth movements were also felt in Vanuatu, Taiwan, northwestern Myanmar and from northern Morocco to Spain's Costa del Sol.

Bird flu vaccine

A new Dutch study finds that bird flu vaccines given to laying hens are effective and could soon be used to protect poultry from a virus that has ravaged birds and other species around the world. The tests were carried out at two farms and showed the vaccine was effective against the virus for eight weeks after vaccination. Egg prices have soared as the highly pathogenic avian influenza killed or forced the culling of millions of poultry around the world. Since there is a threat of the H5N1 strain of bird flu mutating to more easily infect people, researchers say swift vaccine development would be our best protection.

Warming yardstick

Researchers at Britain's University of Leeds have concluded that three individual years of very high global average temperatures will be enough to say that the world has breached the 1.5-degree Celsius climate warming goal set out in the 2015 Paris Agreement. Carbon emissions have already caused global temperatures to rise 1.26 degrees above pre-industrial levels, with some years almost reaching 1.5 degrees. "Once you've crossed the 1.5-degree threshold in your annual temperature changes on three occasions (consecutive or not), it's very likely that we will have crossed the Paris Agreement 1.5-degree level," said climate expert Lawrence Jackson.

Tropical cyclones

Cyclone Remal left at least 65 people dead across eastern India and Bangladesh, one of the longest-lasting on record.

• Typhoon Ewiniar's fury in the northeastern Philippines killed at least seven people amid flooding, toppled trees and fierce wind.

Vanished glaciers

Venezuela has become the first country in the Americas to lose all of its glaciers due to global heating. The six former glaciated peaks in the state of Merida were once a source of great pride and the origin of legends that relate them to mythical white eagles. The International Climate and Cryosphere Initiative recently declared that the remaining Humboldt Glacier, also known as La Corona or "the crown," is already too small to be classified as a glacier any longer. "Our tropical glaciers began to disappear in the 1970s and their absence is felt," astrophysicist Alejandra Melfo told the TV network Telemundo. "It is a great sadness, and the only thing we can do is use their legacy to show children how beautiful our Sierra Nevada once were."

Iceland eruption

Iceland's restive Reykjanes Peninsula produced its fifth eruption since December and the most powerful since the volcanic area became active again three years ago. The country's Met Office said lava fountains reached 115 feet in height. Residents of the small fishing town of Grindavik were forced to evacuate yet again as lava surged from the new fissure. The nearby Blue Lagoon geothermal spa was also closed and evacuated again.

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Distributed by Andrews McMeel Syndication; ©MMXXIV Earth Environment Service

Make peace with nature, official warns

By Jake Spring
Reuters

SAO PAULO >> The world must make peace with nature or risk fueling more global conflicts like the war in Gaza, the president of the upcoming United Nations COP16 biodiversity summit said Friday.

The October summit in Colombia is charged with negotiating next steps to implement the landmark 2022 Kunming-Montreal accord — likened to the Paris Agreement on climate change, but for nature — in order to address the drastic decline in biodiversity globally.

Climate change, deforestation, pollution and habitat destruction have led to a 69% decline in global wildlife populations since 1970, according to nonprofit WWF.

Colombia's environment minister, Susana Muhamad, laid out her priorities as COP16 president, along with a warning if the world fails to reform global governance to solve problems like the climate crisis.

"The situation currently in Palestine, where humanity is observing how a people of the world is being crushed militarily. And there's not even the capacity of the U.N. to provide the humanitarian relief," Muhamad said during a five-minute speech at the Atlantic Council think tank in Washington.

"That situation is what we could expect in a lack of governance and in a chaotic world because of the climate crisis."

Muhamad said the "suicidal war against nature" is causing conflict to increase, but did not elaborate on the connection.

Multilateral institutions are not equipped to deal with unprecedented challenges like climate change and must be overhauled or risk the world slipping into rule by the strong through violence, Muhamad said.

Colombia's top priorities for COP16 include an "intense" discussion on how to reform the global financial system that will allow developing countries to make strong environmental commitments without taking on more debt, she said.

Countries must submit biodiversity targets before the summit. Colombia will prioritize working with U.N. officials to measure how those commitments line up with 2030 goals in the Kunming-Montreal agreement, she said.

Colombia also will seek to boost the participation of Indigenous people and traditional communities in the process, by organizing three pre-summit events giving them an opportunity to lobby governments.

BRUNO KELLY / REUTERS / 2017

An aerial view shows deforested land in Brazil during "Operation Green Wave," conducted by a Brazilian environmental agency.

NOTICE REGARDING FILES OF DECEASED ATTORNEY
CLAYTON C. IKEI

Current and former clients of Clayton C. Ikei may attempt to recover their client files and funds. The Hawai'i Supreme Court appointed Eric Lee Niemeyer as Trustee to collect and inventory Mr. Ikei's client files and funds and return them to his clients. Such clients may respond to this notice within the next 90 days using the information below. Trustee prefers Email but will respond regardless. Trustee will destroy unclaimed files after the set time.

ERIC LEE NIEMEYER
700 Richards St., Ste. 1108
Honolulu, Hawai'i 96813
e-mail: hawaii.lawyer@hotmail.com
Telephone: (541)840-2840

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U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

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Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Līhu'e	Kekaha Neighborhood Center 8130 Elepaio Road, Kekaha	Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.	Project presentation by Navy and NASA.

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For more information visit PMRF-KPGO-EIS.com

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FDI-19160-A AECSPAD 22Mar22

Trump sees 'breaking point' for U.S. if he gets jail time

By Susan Heavey
Reuters

WASHINGTON >> Donald Trump said Sunday he would accept home confinement or jail time after his historic conviction on criminal charges by a New York jury last week but that it would be tough for the public to accept.

Trump is scheduled to be sentenced July 11, four days before Republicans gather to formally choose their presidential nominee to face Democratic President Joe Biden in November's election.

Prison time is rare for people convicted in New York state of felony falsification of business records, the charge Trump, the Republican presidential candidate, faced at his trial. The maximum sentence for such a charge is four years' imprisonment.

"I'm not sure the public would stand for it," the former president told Fox News of a potential prison sentence.

"I think it'd be tough for the public to take. You know, at a certain point there's a breaking point."

Trump has vowed to appeal his conviction by the New York jury, which found him guilty of 34 felony counts over falsifying documents to cover up a payment to silence a porn star ahead of the 2016 election.

To succeed on appeal, Trump, 77, must demonstrate that Justice Juan Merchan made significant errors overseeing the trial.

His lawyers have said they expect to take the case to the Supreme Court. On Sunday, Trump, who tried to oust Merchan from the case, repeated allegations of bias by the judge and the district attorney in the case.

"The United States Supreme Court MUST DECIDE!" Trump wrote on social media.

Trump plans to appeal after his July 11 sentencing date, his lawyers say. If an appeal in New York state courts proves unsuccessful, he could appeal to the Supreme Court. Trump's attorneys would have to persuade at least four of the court's nine justices to hear his case.

DOUG MILLS / NEW YORK TIMES

Former President Donald Trump on Sunday said he was not sure the U.S. public "would stand for it" if he were to receive a prison sentence for his felony business fraud conviction. Trump headed to a news conference Friday in New York.

To prevail, Trump would then have to demonstrate that the state prosecution violated his federal constitutional rights and that his legal team followed proper procedures during earlier stages of his legal proceedings.

'Speak out against this'

Trump has used his conviction to step up his fundraising efforts but has not otherwise sought to mobilize his supporters, in contrast to his comments protesting his 2020 loss to Biden that were followed by a deadly attack by his supporters on Jan. 6, 2021, on the U.S. Capitol.

Asked what Trump supporters should do if he were jailed, Republican National Committee Co-Chair Lara Trump told CNN, "Well, they're gonna do what they've done from the beginning, which is remain calm and protest at the ballot box on November 5th. There's nothing to do other than make your voices heard loud and clear and speak out against this."

Some Trump supporters have hung U.S. flags upside down following the verdict. The inverted flag has been a symbol of distress or protest in America for over 200 years.

At least one Democratic lawmaker expressed concern Sunday about the potential for Trump's supporters to respond violently to his conviction.

"His base listens to him. They don't listen to Lara Trump. And this is another dangerous appeal to violence," Democratic U.S. Rep. Adam Schiff told CNN.

But U.S. House Speaker Mike Johnson, a Trump ally, said any response must be lawful.

"We are the rule-of-law party — chaos is not a conservative value. We have to fight back, and we will with everything in our arsenal. But we do that within the confines of the rule of law," Johnson told "Fox News Sunday."

The matter is unlikely to be resolved before the November presidential election, when Trump will seek to take back the White House from Biden. Opinion polls show a close race between the two men and suggest that his conviction could hurt him with some Republican voters and independents.

In other developments:

>> Roughly a day since joining TikTok, Trump had attracted 3 million followers on the short video social media platform that he tried to ban as president on national security grounds.

Biden's election campaign is already on TikTok, with over 340,000 followers, although Biden has signed a bill that would ban the app, which is used by 170 million Americans, if its Chinese owner, ByteDance, fails to divest it.

Trump posted a launch video on his account, which has the address @realdonaldtrump, on Saturday night. The video, which has more than 56 million views, showed Trump greeting fans at an Ultimate Fighting Championship fight in Newark, N.J.

>> Lara Trump on Sunday denounced Larry Hogan, the Republican Senate candidate in Maryland, for urging Americans to "respect the verdict" against Trump — criticizing a prized recruit who has given the party a chance of winning a seat that has reliably been held by Democrats.

Hogan "doesn't deserve the respect of anyone in the Republican Party at this point, and quite frankly anybody in America, if that's the way you feel," Trump, who is married to Trump's son Eric, said in an interview on CNN. She did not directly answer follow-up questions about whether the Republican Party would continue to support Hogan.

The New York Times contributed to this report.

Around the world

Netanyahu aide says Israel accepts Biden's Gaza plan

JERUSALEM >> An aide to Prime Minister Benjamin Netanyahu confirmed Sunday that Israel had accepted a framework for winding down the Gaza war now being advanced by U.S. President Joe Biden, though he described it as flawed and in need of much more work.

In an interview with Britain's Sunday Times, Ophir Falk, chief foreign policy advisor to Netanyahu, said Biden's proposal was "a deal we agreed to — it's not a good deal, but we dearly want the hostages released, all of them."

Rising heat could worsen Gaza Strip crisis, U.N. warns

Aid groups remain unable to deliver "basic necessities" including tents and clean drinking water to millions of Palestinians in the Gaza Strip as temperatures rise and diseases spread, a United Nations humanitarian official said Sunday, as talks continued about reopening a critical border crossing that has been closed for weeks.

Scott Anderson, a senior official at UNRWA, the main U.N. agency aiding Palestinians in Gaza, told CBS News on Sunday that the trickle of supplies has not been enough to meet people's basic needs.

Boeing and NASA reschedule Starliner debut for Wednesday

Boeing and NASA said Sunday their teams are preparing the first crewed launch of the new Starliner space capsule Wednesday after scrubbing its inaugural test flight Saturday.

The craft will carry two astronauts to the International Space Station. NASA said its teams traced the problem encountered during Saturday's countdown to a ground power supply.

Teacher placed on leave over 'mock slave auction' in class

A fifth grade teacher in Massachusetts who held a "mock slave auction" and used a racial slur in a classroom has been placed on paid administrative leave, the district superintendent said.

The mock auction was held in January during a history lesson, the superintendent of Public Schools of Northborough and Southborough, Gregory Martineau, said in a letter to parents dated Wednesday. In April the teacher read a book to the class and used a racial slur not in the book.

Star-Advertiser news services

Hunter Biden to begin trial today in gun case

By Glenn Thrush
New York Times

WASHINGTON >> Hunter Biden will go on trial on gun charges Monday in Delaware within walking distance of his father's campaign headquarters in Wilmington, less than a week after former President Donald Trump's felony conviction in New York.

A year ago the younger Biden seemed unlikely to face trial on the weapon charges he was facing over a firearm application that prosecutors say was falsified, or from more serious charges of failing to pay taxes from overseas business activities at a time when he was using drugs and alcohol heavily and spending lavishly.

But a plea deal, which offered him some immunity from prosecution and did not include prison time, imploded in July. The judge in the case punched holes in the agreement, to the delight of Trump's Republican allies in Congress who tried to scuttle that deal and have portrayed Biden's legal problems as equivalent to those of their party's 2024 presidential candidate in an effort to impeach President Joe Biden.

Still, it is the son — not the father — who will be on trial twice during an election year.

He is set to report to the fourth-floor courtroom of Judge Maryellen Noreika when jury selection begins today at 9 a.m. in a trial expected to last three to five days. The other, set to begin in September, involves a series of tax offenses related to his failure to file returns for a number of years.

In September a federal grand jury charged Hunter Biden with three felonies: lying to a federally licensed gun dealer, making a false claim on the federal firearm application used to screen applicants and possessing an illegally obtained gun for 11 days, from Oct. 12 to 23, 2018.

"Hunter Biden possessed a firearm while knowing he was an unlawful user of or addicted to any stimulant, narcotic drug or any other controlled substance, in violation of federal law," prosecutors said.

If convicted, Biden could face up to 25 years in prison and $750,000 in fines. But nonviolent first-time offenders who have not been accused of using the weapon in another crime rarely get serious prison time for the charges. In fact, legal experts say it is more likely a sentence could include a central element of the original plea deal: mandatory enrollment in a firearm diversion program intended to reduce incarceration rates for the least serious gun crimes.

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For more information visit PMRF-KPGO-EIS.com

Red Hill tank ventilation rattles some residents

Kevin Knodell
STAR-ADVERTISER

HONOLULU — The Navy has begun tank ventilation and air quality monitoring at the Red Hill fuel storage facility.

Navy Closure Task Force-Red Hill announced on its mobile app last week that the state Department of Health had approved its plans to begin cleaning operations and venting of the facility's Tank No. 8.

It's the latest step in the closure process of the Red Hill facility. But some residents are nervous about potential health and environmental risks as the plan moves forward.

Walter Chun, a member of the Red Hill Community Representation Initiative, said in an email that the Navy's plan to "intentionally discharge the vapor and particulates from the 12.5M gallon fuel tank at Red Hill … to the environment (risks) human exposures to hazardous substances, especially for children and infants, and pose a potential wildfire risk for the nearby residential neighborhoods."

The Navy task force has installed nine air quality monitoring stations around Red Hill's perimeter, including the at Halawa Correctional Facility. Navy officials said the stations will monitor air quality as well as atmospheric data such as air speed and wind direction.

"NCTF-RH has worked closely with DOH to ensure ventilation of the tanks is done in a manner that will not pose a risk to human health," said task force deputy commander Rear Adm. Marc Williams in a statement included in the news release on the app. "Our team is committed to safely decommissioning the facility, and tank ventilation operations get us another step closer to this goal."

In November 2021, JP-5 jet fuel stored at Red Hill tainted the Navy's Oahu water system that serves 93,000 people. The facility sits just 100 feet above a critical aquifer which most of Honolulu relies on for drinking water and for years local health and water officials warned the fuel posed a serious risk to Oahu's water supply. The Navy for its part insisted the World War II-era facility was safe and critical for national security.

After months of resisting a state emergency order to drain the tanks, in March 2022 the Pentagon announced that Red Hill would be defueled and permanently shut down.

It took a joint military task force nearly a year to make repairs and upgrades to the aging facility and the pipelines connecting them to Joint Base Pearl Harbor-Hickam to safely extract over 104 million gallons of fuel from the tanks.

Repairs concluded in summer 2023 and by March the defueling task force had removed most of the fuel with the exception of residual sludge within the tanks that would require deeper cleaning to remove.

The defueling task force's commander Vice Adm. John Wade told the Honolulu Star-Advertiser in an exit interview before NCTF-RH took over operations that while the removal of the fuel got one major risk out of the way, many more dangers remain before the closure process is over.

"Defueling had its own challenges and risks, closure and long-term environmental remediation will bring new challenges and new risks," Wade said. "So it's critical to the … health of the workers and the community and the environment to focus on safety."

During the February meeting of the Red Hill Community Representation Initiative, the facility's former fuel director Shannon Bencs attended and asked officials how they will approach community safety as they try to clear out gases and chemicals. "Now that you've defueled the tanks and the pipelines, now there's poisonous toxic fumes in those tanks, and the only way to vent them out is through the top of Red Hill and then through the (vents)," Bencs said, warning that it will be "extremely toxic, and it will flow down to Halawa Valley and down to Pearl Harbor."

Rear Adm. Stephen Barnett, commander of Navy Region Hawaii, told Bencs, "that is something that we'll be working through as far as the ventilation," and that the Navy would ensure the community would be notified.

Members of the CRI have been critical of officials, accusing them of withholding information and dodging questions. The Navy has in turn argued that CRI members have been aggressive and disrespectful. The EPA has called for a mediator to be brought in to manage the dispute.

"Although the CRI raised concerns with the allowance of discharging contaminants and pollutants in March 2024, both the Navy and EPA ignored these concerns," said Chun. "Their focus since March was attempting to control the CRI meetings. Our focus in Hawaii must narrow in on the practices to allow intentional contaminants and pollutants to harm people and the environment."

The CRI put out a public notice Wednesday night that said venting operations would begin the next day and will continue until all 14 tanks that held fuel are degassed, with operations set to take place daily between 6 a.m. and 8 p.m. and advising "the discharge from the tanks is not filtered or captured. There is a risk of exposure to toxic fumes from the discharge. People are advised to be vigilant about their health."

The CRI advised that people living or working in the vicinity of Moanalua, Salt Lake, Halawa Correctional Facility, and all military housing surrounding the Red Hill fuel tanks should be aware and recommended people consider limiting time outdoors and wearing masks.

In a Thursday media release, state health officials said their conditional approval of the venting plan requires the Navy to notify the public at least 12 hours before the start of venting a tank, and that it immediate notify the Health Department if it detects an "exceedance" of expected chemicals in the air and stop the venting.

The approval also limits the number of tanks that may be vented in a calendar year to six, the number of tanks that may be vented at any time to two, and requires the Navy to notify DOH within 24 hours of starting to vent a second tank.

Green: Maui wildfire victims have until June 15 to register for One 'Ohana Fund

Kacie Yamamoto
STAR-ADVERTISER

Families who lost a loved one, or people who suffered serious injury, in the August wildfires on Maui now have until June 15 to submit a registration form for the One 'Ohana Fund, Gov. Josh Green announced Friday.

The deadline for registered claimants to submit completed claim forms is July 15.

The extension will give Maui wildfire survivors more time to decide whether they want to seek compensation through the fund.

Announced in November, the $175 million One 'Ohana Fund was designed to allow those eligible to participate in settlements and avoid lengthy and uncertain litigation for claims of wildfire-induced losses. The fund aims to provide money to affected families and individuals quickly.

Payments to surviving family members who lost loved ones will be $1.5 million, while settlements for people who suffered severe injuries will vary.

The deadline for applications was last extended to May 31 at the beginning of May.

"From the time we introduced the fund in November, our intention was to provide families with a timely option that would potentially allow healing and recovery more quickly," Green said in a news release.

"The response from the survivor community last time we extended the deadline was encouraging, and I want to respect the requests of other survivors and their counsel to have additional time to determine what is right for their families."

The fund encompasses contributions from Hawaiian Electric ($75 million), the state of Hawaii ($65 million), Kamehameha Schools ($17.5 million), Maui County ($10 million), Charter/Spectrum ($2.5 million), Hawaiian Telcom ($2.5 million) and West Maui Land Co. ($2.5 million).

"Survivors and their attorneys have been asking for additional time to complete their submissions of claims to the fund," retired Judge Ronald Ibarra, who serves as the fund's administrator, said in the release.

"We all believe that this compassionate extension is aligned with the mission of the fund, to give survivors the option of seeking compensation without the risks that accompany litigation."

The fund began accepting applications March 1, and since then it has received 48 registrations from families who have lost loved ones and 17 registrations from injured survivors, according to the release.

The fund is already processing these claims, and the extension will not delay this process for claims already submitted.

Ibarra said the program expects to begin making payments to those approved within the next 60 to 90 days.

Honolulu-based attorney Richard M. Sakoda, who represents an applicant family and has been communicating with other survivors' families, requested the first deadline extension in April and said he supports the most recent registration extension as well.

"I wholeheartedly support this extension and appreciate the compassion behind the decision," Sakoda said in the release.

"We have seen that claims to the fund have increased, as families have learned more about the uncertainties of litigation."

Phase I of the One 'Ohana Fund focuses on providing compensation to families who lost loved ones and to people severely injured in the fires. Phase II will involve the settlement of commercial and residential property claims.

The Maui wildfires killed at least 101 people and destroyed or damaged almost 3,000 structures.

Applications and more information for the fund can be found at www.mauicompensationfund.com.

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Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Lihu'e	Kekaha Neighborhood Center 8130 Elepaio Road, Kekaha	Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
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For more information visit PMRF-KPGO-EIS.com

nation&world

Biden to sign order letting him seal border

By Josh Wingrove and Erik Wasson
Bloomberg News

WASHINGTON >> President Joe Biden will sign an executive order today halting certain asylum claims at the U.S.-Mexican border until crossings fall dramatically, a sweeping attempt to curb the flow of migrants and address one of his biggest liabilities ahead of November's election with Republican Donald Trump.

The move would effectively prevent new asylum claims by migrants who walk across the border until levels drop by roughly two-thirds of where they stand today, according to people familiar with the matter, who requested anonymity to detail the plans before they are publicly announced.

The measure would kick in once levels hit roughly 2,500 crossings per day between ports of entry. U.S. authorities recorded about 4,300 encounters per day in April with undocumented migrants between ports of entry, the most recent data available. That means the administration can move quickly to bar a large swath of asylum claims, though the policy is sure to be challenged in court.

Lawmakers and others have been invited to the White House for an event this afternoon, the people said. Biden would allow asylum claims to resume only once border encounters fall to about 1,500 a day, the people said. The Associated Press reported earlier on the president's plans.

The order is Biden's most aggressive move yet to address the crisis on the U.S.-Mexican border, which has seen record levels of migrants and taxed communities across the country struggling to deal with the influx of new arrivals. A bipartisan Senate plan that would have given Biden similar powers was blocked by Republicans earlier this year at Trump's behest, denying the president a political win and prompting him to act unilaterally.

Today's order is politically risky. It will invite criticism from Biden's left flank, which has blasted moves to ramp up deportations as an inhumane approach to the crisis. That has the potential to stymie his efforts to shore up an electoral coalition already riven by divisions over his handling of the Israel-Hamas war and overarching concerns over his age and fitness to serve a second term.

But the move underscores how the administration has been compelled to act alone to address an issue that has become a centerpiece of the 2024 election. The action could allow Biden to highlight how Republicans killed the bipartisan bill.

CRAIG HUDSON / REUTERS

President Joe Biden is expected to sign an executive order today letting him temporarily seal the U.S. border with Mexico to migrants when crossings surge. Biden boarded Air Force One as he departed Monday for Connecticut from Delaware Air National Guard Base in New Castle, Del.

Trump has hammered Biden on the border, ramping up attacks on immigrants and spotlighting violent crimes allegedly committed by people who crossed the border. Polls show a close race between Trump and Biden, and voters say the border and immigration are critical issues.

Biden's timing reflects an effort to deter an increase in crossings that typically happens in summer and early fall right before the election, and comes amid a political transition in Mexico.

Outgoing Mexican President Andres Manuel Lopez Obrador has taken steps to curb crossings. His successor, Claudia Sheinbaum, who was elected the next leader Sunday, doesn't take office until Oct. 1, and it is unclear what actions she will continue to take. The U.S. administration has said it has no reason to expect a change.

Border crossings have already fallen from the highs seen in late 2023, and Biden has taken steps in recent weeks to tighten immigration rules and drive down those numbers further. In May the administration proposed a rule that would allow the U.S. to expedite expulsions of undocumented migrants seeking to claim asylum in certain cases, though the change will only affect a small percentage of those caught on the border.

Biden will look to enact some of the changes under Section 212(f) of the Immigration and Nationality Act, a disputed authority that will surely invite legal challenges. Trump's actions on immigration while president, including his controversial travel ban, also invoked those authorities and tested the boundaries of the law. Some of his measures were overturned in court, limiting the options available to Biden.

The American Civil Liberties Union led the charge against the Trump administration's attempt to block asylum in 2018. The group has signaled that it is ready to challenge any order that limits asylum at the border.

Top Department of Homeland Security officials have stressed the limits of executive action. More broadly, the White House has argued the main constraint on addressing the situation at the border is a lack of funding and staffing — issues Biden can't address on his own. The White House has repeatedly said any executive action it takes will not match the power that a bill passed by Congress would have.

Still, Republicans have criticized the expected move. "It's too little too late," House Speaker Mike Johnson told Fox News on Sunday. "The only reason he's doing that is because the polls say that it's the biggest issue in America."

The New York Times contributed to this report.

Trump's harder line on immigration appears to resonate, polls show

By Jazmine Ulloa
New York Times

WASHINGTON >> Former President Donald Trump has described his plans to remove large numbers of immigrants lacking permanent legal status from the country if elected to a second term by citing the mass deportations under President Dwight D. Eisenhower in the 1950s.

In that initiative, federal agents and law enforcement officers used military techniques such as sweeps, raids and surveillance checkpoints — as well as a blunt form of racial profiling — to round up workers living in the country illegally and load them onto buses and boats. As many as 1.3 million people were expelled, mostly Mexican and Mexican American workers, some of whom were U.S. citizens. Crucial to the initiative — named Operation Wetback, for the racial slur — was intense anti-immigrant sentiment. Officials at the time used that sentiment to justify family separations and overcrowded and unsanitary detention conditions — practices that the Trump administration would deploy decades later in its own immigration enforcement.

As the 2024 presidential election heats up, some Latino advocacy and immigrant-rights groups are sounding the alarm that Trump's tactics could amount to a repetition of a sordid chapter of American history. But recent polling shows that Trump's position on immigration appears to be resonating. About half of Americans have said they would support mass deportations of immigrants in the country illegally, according to a CNN poll conducted in January by the research firm SSRS.

Authorities have reported record numbers of migrant apprehensions at the southern border for three straight years, including 2.4 million apprehensions in the fiscal year that ended in September. Although the numbers have dropped sharply in recent months, immigration remains an albatross for President Joe Biden: Even some Democratic mayors have complained that they need help from the federal government to contend with the migrant populations in their cities.

Trump's restrictive approach to immigration, both legal and illegal, helped push Americans of various political stripes to support more permissive policies.

During his first term Trump narrowed the path to asylum, sharply reduced the numbers of visas and refugee admissions and enacted a travel ban on people from several countries, most of which had Muslim majorities. His administration rolled back protections for immigrants brought into the country illegally as children, and it separated migrant families at the southern border.

By the time he left the White House, more Americans favored increasing immigration for the first time in six decades of Gallup polling.

But more recent surveys from Gallup and others have found that the number of people who believe immigration is generally beneficial to the country's culture and economic growth has been slowly eroding from a recent high. A small but growing minority of Americans are increasingly concerned about its impact on drugs, crime, taxes and national identity.

An open-ended Gallup poll released April 30 found that for the third straight month, most Americans cited immigration as the most important problem facing the United States. That was the longest stretch that the issue had topped the list in the survey's 24-year history. A Gallup poll released Friday showed immigration dropping to second on the list in May, still high by historical standards.

It is not just illegal immigration causing consternation. A different poll in March from The Associated Press-NORC Center for Public Affairs Research found that Americans have become more worried about immigrants in the country legally committing crimes, though many studies have found no correlation between immigration and crime, regardless of whether people entered the country legally.

In February a nationwide New York Times/Siena College poll showed that 49% of voters either strongly or somewhat supported making it harder for migrants at the southern border to seek asylum in the United States, slightly more than the 43% who either strongly or somewhat opposed doing so.

As Democrats and Republicans have drifted further apart on immigration, Republicans are far more likely to cite immigration as a top concern.

A Pew study in February found that 70% of Republicans described the challenges at the southern border as a "crisis," compared with just 22% of Democrats. Another poll in 2023 from Gallup showed 73% of Republicans wanted immigration to be decreased. By contrast, only 18% of Democrats said they wanted the same. Republicans were also far more likely to see immigrants as worsening the country's social and moral values, job opportunities and taxes.

U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

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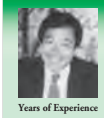

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City land donation proposed for homes

Andrew Gomes
STAR-ADVERTISER

HONOLULU — For the third time in two decades, city officials are seeking to make residential use out of a large parcel of vacant city land in Kailua.

Two Honolulu City Council members plan to introduce a resolution on Tuesday, June 4, proposing to largely give the 10-acre site, valued at $10.5 million, to the state Department of Hawaiian Home Lands (DHHL) so the agency can develop about 20 single-family homesteads for beneficiaries.

If successful, the plan would dispose of an unused property in the Kalaheo Hillside area that the city has owned for 63 years, and establish the first DHHL homestead in Kailua.

Two prior attempts, however, have failed. And some adjacent neighbors previously have opposed development of housing on the parcel despite it being zoned for single-family housing.

Council member Esther Kia'aina, whose district includes Kailua, has authored the resolution with Council Chair Tommy Waters.

Kia'aina said Friday that the proposal represents a historic opportunity for the city to establish the first-ever DHHL community in Kailua and to honor Prince Kuhio, who was pivotal in establishing the homestead program and the City and County of Honolulu.

"Through this city land transfer, we hope to address the critical need for housing on O'ahu while helping our Native Hawaiian community," she said in a statement. "Establishing a Hawaiian homestead in Kailua will ensure that Native Hawaiians can continue to live and thrive in this special place."

CRAIG T. KOJIMA / STAR-ADVERTISER

This vacant 10-acre parcel in the Kalaheo Hillside area of Kailua, Hawai'i, has been owned by the City of Honolulu since 1961 and is zoned for residential use. A pair of Honolulu City Council members proposed largely gifting the land to the state Department of Hawaiian Home Lands for homestead use.

Honolulu Mayor Rick Blangiardi endorsed the proposal.

"This initiative is consistent with the city's firm commitment to address O'ahu's affordable housing crisis by partnering with other organizations that share the responsibility and desire to facilitate the availability of affordable housing for Native Hawaiians — a community significantly impacted by the rising costs of land on O'ahu," he said in a statement.

The effort by Kia'aina and Waters represents a third try in the past two decades by city officials to have the land once slated for an elementary school to become housing.

The city bought the property from Kaneohe Ranch in 1961 to provide land for an envisioned Kalaheo Elementary School. At the time the city was in charge of building schools.

In the years since new-school development was transferred to the state Department of Education, plans for Kalaheo Elementary were abandoned because four existing elementary schools in the area — Aikahi, Kailua, Kainalu and Mokapu — were sufficient.

With no need for a school on the site, the state Board of Education approved the city's desire to dispose of the parcel, which has views of the ocean and borders 18 homes along with the Kailua Assembly of God church below roughly 200 acres of preservation land.

In 2006, city leaders identified the site as one of a dozen city properties suited for low-income or homeless transitional housing.

But that effort, which envisioned contributing the land to a public-private development partnership at little cost to produce 60 multifamily homes, was never realized despite motivation to help address a critical need for affordable housing.

Another plan was floated in 2015 to sell the property for fair market value to a private developer via sealed bids. The Council's then-chair, Ernie Martin, introduced a resolution to seek bidders, but that effort fizzled as well.

Martin's plan encountered pushback from area residents who expressed concerns with issues that included traffic and land stability.

Ikaika Anderson, who at the time was the area's representative on the Council, reported that an overwhelming message from Kalaheo Hillside residents was that the city shouldn't sell the land to the highest bidder for residential development.

"The community opposes development and any sale," Anderson said at the time.

Hawaii's affordable housing crisis has only gotten worse over the past two decades. At the same time, DHHL has a lot of capital to expand its homestead development work.

The state Legislature in 2022 appropriated $600 million for the agency to mainly develop homesteads for beneficiaries, who must be at least 50 percent Hawaiian to directly receive 99-year land leases for $1 a year from DHHL but must pay for or build their own houses.

About 28,700 applicants are on DHHL's wait list for homesteads, and the agency aims to use the $600 million to produce 2,180 lots. Most of these lot development projects are large-scale, such as 450 lots at East Kapolei II on O'ahu, 380 lots at Laiopua Villages on Hawai'i Island and 161 lots at Pu'uhona on Maui.

DHHL is pursuing some small projects as well. They include 20 lots in Ho'olehua on Molokai and 25 lots on 3 acres of preservation-zoned land in Hawai'i Kai being acquired from Kamehameha Schools.

If the Kailua land deal is approved, DHHL could establish its first homestead community in the Windward O'ahu community.

"This conveyance is much more than the passing of land from one government agency to another; it is about giving our ohana the opportunity to root themselves in a community for generations to come," DHHL Director Kali Watson said.

"Transferring this land from the city to DHHL is a priceless gift that will create lasting benefits for our ohana," Watson said in a statement. "This partnership paves the way for our beneficiaries to build a community in Kailua, underscoring the tangible outcomes achievable through collaborations like this."

The resolution proposes to mainly give DHHL the land as an important public purpose.

City property tax assessors value the land at $10.5 million. The resolution proposes a sale price of $495,323. This amount, according to the resolution, represents the city's cost for previously exchanging land in Ewa with DHHL as part of the city's rail project.

obituaries

Reynaldo Jacinto Abrigo

Reynaldo Jacinto Abrigo passed away on May 17, 2024, in Lihu'e at the age of 54. He was born on April 17, 1970, in the Philippines. He was a cook.

He was preceded in death by father Ramon Abrigo.

He is survived by mother Charito Abrigo, daughter Mina (Ferdie) Guerrero, sons Reyson Abrigo, Kasen Abrigo, sister Maribel (Lito) Mejia, brother Nino (Jodi) Abrigo, two grandchildren, numerous nieces and nephews.

A service is Thursday, June 13, 2024, at Immaculate Conception Church in Lihu'e. Visitation begins at 8:30 a.m., Mass at 10 a.m., and burial to follow at Kalapaki Bay Memorial Park.

Borthwick Kaua'i Mortuary is assisting the family with arrangements.

Susan Pedronan Andrade

Susan Pedronan Andrade passed away on May 18, 2024, in Aiea, O'ahu at the age of 83. She was born on July 6, 1940, in Bangui, Ilocos Norte, Philippines. She was a supply clerk and nurse aide.

She was preceded in death by husband Alfred Andrade, parents Gregorio Pedronan and Luisa Pedronan, brothers Marcello Pedronan Sr., Nicomedes Pedronan and Elpidio Pedronan.

She is survived by brother Flor Pedronan, sisters Nives Soriano and Helen Pedronan.

A service is Saturday, June 15, 2024, at Holy Cross Catholic Church in Kalaheo. Visitation begins at 8:45 a.m., Mass at 9:45 a.m., and burial to follow at Holy Cross Catholic Church Cemetery.

Borthwick Kaua'i Mortuary is assisting the family with arrangements.

Michael Manzano Abigania

Michael Manzano Abigania, of Mission Viejo, California, loving husband, father, grandfather, brother, and friend, went to be with the Lord on Sunday, March 17, 2024. He was born in Vigan, Ilocos Sur, Philippines on June 8, 1952.

Abigania

Michael is survived by his wife, Arminda Pascual Abigania; daughters, Sherry (Franklin Jr.) Matthews, Michelle (Victor) Abigania-Libunao, Melany (Eric) Abigania-Chun; grandchildren, Makana, Kainani Libunao, Malia, Micah, Jacob, Jade Matthews; brothers, Louis (Edith) Abigania, Robert (Doris) Abigania, Richard (Tess) Abigania, Glenn (Sharon) Abigania, Reynold Abigania; sisters, Nancy Abigania, Vicky Abigania, Christine (Bernard Sr.) Mabini, Alice (Reggie) Hunt, and Brenda (Ho-Tai) Zerba.

Michael was preceded in death by his parents Rufo and Mary Abigania and sister Cynthia Dela Cruz.

Family and friends are invited to a Celebration of Life on Saturday, June 8, at St. John's Episcopal Church located in Ele'ele, at 10 a.m. Casual attire is requested.

U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park
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JUNE 8
POKE FEST

The fourth annual Kaua'i Poke Fest returns to Kōloa Landing Resort with celebrity chef Sam Choy. The festival will feature live entertainment, 20 professional and amateur chefs and more than 600 pounds of fresh 'ahi poke. Proceeds will go toward Hawai'i Community Foundation's Maui Strong Fund.

Saturday, June 8, 2-7 p.m.
To purchase tickets, visit bit.ly/4bT49yc

8 JUNE

COMIC CON

Enjoy a day full of fun family entertainment at Kaua'i Comic Con 3, which takes place at Royal Sonesta Kaua'i Resort (3610 Rice St.) in Līhu'e. Comic cans can expect special guests, a cosplay contest and other activities. The event also features an array of vendors offering a range of merchandise and collectibles. Tickets are $25 for adults and free for children age 12 and under when accompanied by a paying adult.

Saturday, June 8, 11 a.m.-6 p.m.
For more info and ticket purchases, visit kauaicomicconvention.com

8 JUNE

ART EXHIBIT

Kaua'i Society of Artists' annual art exhibit, Washed Up, will have its opening reception at 2600 Kaumuali'i Hwy. in Līhu'e. Attendees can view unique artworks created out of marine debris cleaned up off of Kaua'i shorelines. Admission is free.

Saturday, June 8-Friday, June 28
For more info, visit kauaisocietyofartists.org

Answers To This Week's
SUDOKU PUZZLE

8	9	7	2	3	6	4	5	1
2	5	1	8	4	7	6	3	9
4	6	3	1	5	9	8	2	7
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5	7	2	3	1	8	9	6	4
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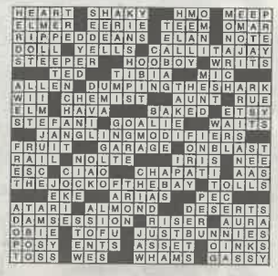
6	8	4	9	2	5	7	1	3

Answers To This Week's
CROSSWORD PUZZLE



Answers To This Week's
SPOT 10 DIFFERENCES

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The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawai'i Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

The public scoping period begins ***May 8, 2024, and ends June 17, 2024***. Please attend a public scoping meeting and visit the project website to learn more. For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Submit Comments in Person, Online, or by Mail. Submit comments by ***June 17, 2024***. The public may submit comments in any of the following ways: In person at a public scoping meeting, through the project website at PMRF-KPGO-EIS.com, by email to info@PMRF-KPGO-EIS.com, or by mail, postmarked by ***June 17, 2024*** to the following address: Naval Facilities Engineering Systems Command, Hawai'i, Environmental OPHEV2, Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, 400 Marshall Road, Building X-11, Pearl Harbor, HI 96860.

For more information visit PMRF-KPGO-EIS.com

No ka Hōʻola ʻŌlelo Hawaiʻi ma ka Heʻenalu

Na Kaʻiwakīkahapono L. Foster, Grade 12
S.M. Kamakau Public Charter School

A ʻau mālie
Eia mai ka makakai heʻenalu
Kai heheʻe kākala o ka moku
ʻAuhea ʻoukou e nā hoa heʻenalu, nā hoa haku mele, nā hoa aloha ʻōlelo, aloha lāhui.
Oʻahu o Kākuhihewa
Koʻolauloa, Koʻolaupoko
Aia nō Kona, Aia nō ʻEwa
Aia ʻo Waialua, Aia ʻo Waiʻanae
Aia ka piko i Kūkaniloko
Hānau ʻia nā aliʻi
Kani mai ʻo ʻŌpuku me Hāweo
Ola nā mamo o Kākuhihewa

Ikēia mahina e hoʻohanohano ai kākou i ko kākou ʻōlelo makuahine, ka ʻōlelo Hawaiʻi, haʻaheo au e hāpai i kēia lono hoʻohauʻoli hauli.

I ka makahiki i hala iho nei, ua hoʻokumu ko Kamakau i ka pūʻali heʻenalu ʻōlelo Hawaiʻi piha, mua loa o ko Hawaiʻi pae ʻāina, o kēia au. A komo mākou ma nā hoʻokūkū heʻenalu ʻāpuni ʻo kō Oʻahu pae ʻāina. A paio aku paio mai mākou me nā kula kiʻekiʻe ʻē aʻe, e like hoʻi me kō Kamehameha, kō Punahou, kō Kahuku, kō Waialua, kō Waiʻanae, a pēlā wale aku.

Ma ka wā iā Kākuhihewa, aia kekahi kūlana nalu kaulana āna i heʻe ai. ʻO ia ʻo Mākāhā, i Kou, i Honolulu.

"Kū ka puna, ke koʻa i uka
Ka mākāhā o ka nalu o Kākuhihewa
Ua ʻō ʻia, nohāhā ka papa"

Aloha nō! ʻAʻole hoʻi i kamaʻāina nā maka o kēia hanauna i ia kūlana nalu. ʻAʻole paha i kamaʻāina nā pepeiao o kēia hanauna i ke kani haʻihaʻi o ia poʻinanalu. ʻAʻole paha i kamaʻāina nā ihu o kēia hanauna i ke ea ʻehukai ke pā mai ka makani Kona. ʻAʻole nō hoʻi i pae kēia hanauna ma ua nalu ala no ke kūkulu ʻia o kekahi pā pōhaku pale kai ma laila. Minamina!

Eia nō naʻe ka manawa e ʻau, pae, a heʻe nei i mua. Ola nō kēia mau lama ʻālohilohi o ka wā i hala ma o nā moʻolelo, nā mele hīmeni, me nā mele oli. No kākou, nā mamo ʻōlelo Hawaiʻi o kēia hanauna ke kuleana e hoʻāla i nā inoa o kēia mau wahi i ola ma o nā mele, ma nā waihona noʻonoʻo, ma nā naʻau, a ma nā waha hoʻi o kēlā me kēia kanaka o Hawaiʻi pae ʻāina.

No laila e nā hoa, eia nō mākou, ko Kamakau e kū nei i ka welo o kēia ʻohana ʻōlelo Hawaiʻi ma ka hoʻōla ʻana i ka ʻōlelo Makuahine ma kā mākou mau hana like ʻole, e laʻa hoʻi me ka hoe waʻa me ka heʻe nalu.

Ola nā iwi iā kākou
Ola ka inoa ʻo Mākāhā!
Ola ka ʻōlelo!
Ola ka lāhui! ■

U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in the environmental planning process.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawaiʻi lands on Kauaʻi for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawaiʻi land on Kauaʻi for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

The Navy and NASA will host public scoping meetings at three locations on Kauaʻi. Attend **any of the public scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this planning process. Meetings will be held from 5 to 8 p.m. HST at the following locations:**

PUBLIC SCOPING MEETINGS

Tuesday, June 4, 2024	Wednesday, June 5, 2024	Thursday, June 6, 2024
Kauaʻi Veterans Center 3215 Kauaʻi Veterans Memorial Hwy, Līhuʻe	Kekaha Neighborhood Center 8130 Elepaio Road, Kekaha	Sheraton Kauaʻi Coconut Beach Resort 650 Aleka Loop, Kapaʻa

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.	Project presentation by Navy and NASA.

The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawaiʻi Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

The public scoping period begins *May 8, 2024, and ends June 17, 2024*. Please attend a public scoping meeting and visit the project website to learn more. For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Submit Comments in Person, Online, or by Mail. Submit comments by *June 17, 2024*. The public may submit comments in any of the following ways: In person at a public scoping meeting, through the project website at PMRF-KPGO-EIS.com, by email to info@PMRF-KPGO-EIS.com, or by mail, postmarked by *June 17, 2024* to the following address: Naval Facilities Engineering Systems Command, Hawaiʻi, Environmental OPHEV2, Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, 400 Marshall Road, Building X-11, Pearl Harbor, HI 96860.

For more information visit PMRF-KPGO-EIS.com

Attachment D

DEPARTMENT OF THE NAVY
COMMANDER, PACIFIC MISSILE RANGE FACILITY

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
GODDARD SPACE FLIGHT CENTER

5090
Ser N4/0306
April 30, 2024

Dear Sir or Madam:

SUBJECT: U.S. NAVY PACIFIC MISSILE RANGE FACILITY AND NASA KŌKEʻE PARK GEOPHYSICAL OBSERVATORY REAL ESTATE ENVIRONMENTAL IMPACT STATEMENT

The U.S. Department of the Navy and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended by the Fiscal Responsibility Act of 2023, and in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR) (Hawaiʻi Administrative Rules [HAR] § 11-200.1-23 (a)(4)).

In the EIS, the Navy and NASA will evaluate the potential environmental consequences of the Navy's and NASA's proposal to retain the use of 8,348 acres and 23 acres, respectively, of State lands presently utilized pursuant to leases and easements on Kauaʻi, Hawaiʻi, for operational continuity and sustainment at the Pacific Missile Range Facility (PMRF), and NASA's continued operations, including measurements of the Earth's rotation and local land motion, at Kōkeʻe Park Geophysical Observatory (KPGO). The Proposed Action is needed because the existing real estate agreements for these State lands are set to expire between 2027 and 2030. Preserving the long-term Department of Defense and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global and local significance.

For DLNR, in addition to its role as the lessor of State lands, the proposed real estate action presents an opportunity for the agency to secure a revenue source to support its management of public lands and associated environmental and conservation programs. Fees from leases and easements are put into a State fund as required by law.

By ensuring continued Navy and NASA operations on Kauaʻi, the real estate action would also preserve local jobs and income for the residents of Kauaʻi, financially contribute to the overall economic well-being of Kauaʻi, and maintain continued conservation management of natural and cultural resources on State lands at no cost to the State of Hawaiʻi.

The EIS will evaluate the potential environmental effects of the Proposed Action and alternatives, including the No Action Alternative. The EIS will satisfy both federal and State of Hawaiʻi requirements and provide the necessary analyses to allow the Navy, NASA, and DLNR to consider the environmental effects of the Proposed Action as part of their decision making.

For portions of PMRF, the Navy has lease agreements with the State of Hawai'i for 8,348 acres, comprised of 684 acres of leaseholds and 7,664 acres of easements. The Navy operates on 410 acres of the total acres leased from the State of Hawaiʻi. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the range's mission. The Navy's current leases and easements support mission operations, access, and utilities at five general locations: Main Base, Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge.

PMRF is the world's largest instrumented multi-domain training and testing facility. PMRF is an essential part of Department of Defense training, research, development, testing, and evaluation. PMRF is unique because of its ability to support simultaneous surface, subsurface, air, and space operations. On Kauaʻi, the Navy is the largest high-tech employer and third largest overall employer. Most of the 900 personnel at PMRF are civilians, including many from the local community. PMRF contributes approximately $150 million annually in salary, contract goods, and services to the local economy. PMRF supports operations from single-unit exercises to large-scale multiple-unit training events. PMRF is located on the southwest coast of the Hawaiian island of Kauaʻi.

NASA operates KPGO to collect geodetic data about the Earth's shape, orientation in space, and gravity. This data supports modern navigation technology such as the Global Positioning System (GPS) that is used every day in a wide variety of devices, from handheld smartphones to satellites. In addition, this data is used for scientific studies, spacecraft navigation, and the geolocation of Earth observations. Continued operation of KPGO is needed to ensure these data-related operations of global and local significance can continue, allowing multiple agencies' missions to persist without interruption. KPGO is located on a remote ridge within Kōkeʻe State Park in the western portion of Kauaʻi. NASA has issued a Use Permit to the Navy for use of portions of KPGO for mission support with radar, telemetry, and communications services.

For more information about KPGO, visit https://space-geodesy.nasa.gov/NSGN/sites/KPGO/KPGO.html. For more information about PMRF, visit https://cnrh.cnic.navy.mil/Installations/PMRF-Barking-Sands/.

PUBLIC SCOPING PERIOD

The Navy and NASA are initiating a public scoping period to receive comments on the scope of the EIS. The Navy and NASA will conduct the public scoping efforts in accordance with NEPA and Hawaiʻi Revised Statutes (HRS) Chapter 343. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42.

Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action, including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS.

The public scoping period for the EIS begins May 8, 2024, and ends June 17, 2024. The Navy and NASA are requesting public comments for consideration in development of the Draft EIS. Comments are requested to be postmarked by June 17, 2024. Public scoping meetings will be held June 4 to 6, 2024, on the island of Kaua‘i.

For more information, please review the enclosures and visit the project website at **PMRF-KPGO-EIS.com**. If you would like to request a briefing with our Navy and NASA team, please contact the PMRF Public Affairs Officer at **(808) 335-4740** or **PMRFPublicAffairs@us.navy.mil**. Thank you for your interest in the project.

Sincerely,

David A. Reth
Director, Management Operations
Goddard Space Flight Center
National Aeronautics and Space Administration

Sincerely,

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer
Pacific Missile Range Facility

Enclosures: 1. Public Scoping Meetings and How to Submit Public Scoping Comments
2. Project Location Map

Distribution: Commander, U.S. Pacific Fleet
Commander, Navy Region Hawaii
Commander, Navy Facility Engineering Systems Command Hawaii
Interested Parties Contacted During Scoping, Appendix C to Environmental Impact Statement Preparation Notice for PMRF and KPGO of May 2024

Public Scoping Meetings and How to Submit Public Scoping Comments

PUBLIC SCOPING MEETINGS

The Navy and NASA will host public scoping meetings at three locations on Kaua‘i. The public is encouraged to attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments. All meetings will be held from 5 to 8 p.m. HST at the following locations:

Tuesday, June 4, 2024
Kaua‘i Veterans Center
3215 Kaua‘i Veterans Memorial Hwy, Līhu‘e

Wednesday, June 5, 2024
Kekaha Neighborhood Center
8130 Elepaio Rd., Kekaha

Thursday, June 6, 2024
Sheraton Kaua‘i Coconut Beach Resort
650 Aleka Loop, Kapa‘a

Meeting Times: 5 to 8 p.m.
Agenda:

- **5 to 8 p.m.** Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.
- **6 to 6:30 p.m.** Project presentation by Navy and NASA.

HOW TO SUBMIT COMMENTS

Submit Comments in Person, Online, or by Mail

Submit comments by June 17, 2024. The Navy and NASA encourage the public to attend a public scoping meeting and visit the project website to learn more. Comments should be related to the proposed real estate action, including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS.

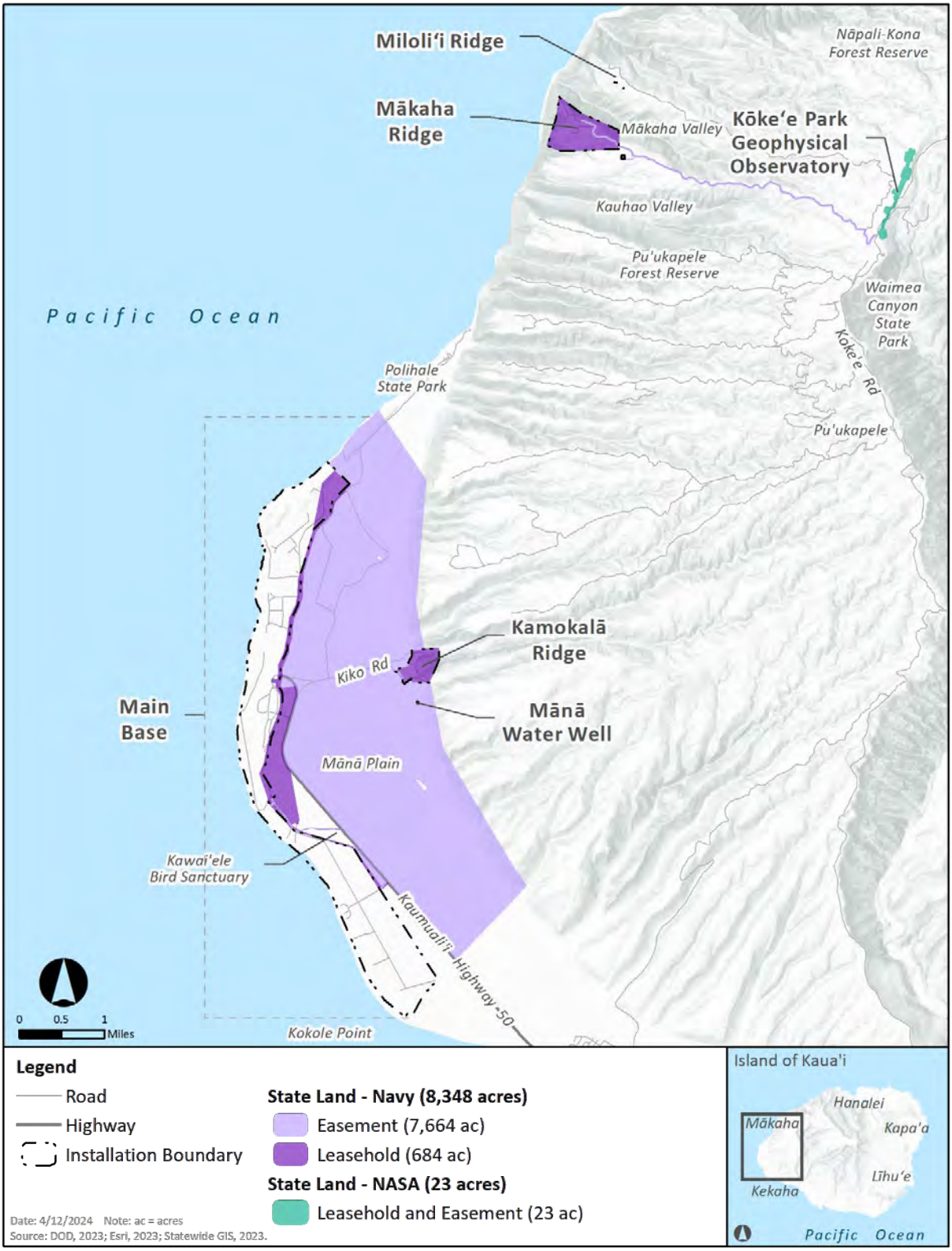
The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024, to the following address:
  Naval Facilities Engineering Systems Command, Hawai'i
  Environmental OPHEV2
  Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

For more information, visit the project website at **PMRF-KPGO-EIS.com**.

For language assistance or special accommodations, contact the PMRF Public Affairs Officer at **(808) 335-4740** or **PMRFPublicAffairs@us.navy.mil**. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Project Location Map



Attachment E

E Pane Mai Ka Nonoi O Nohili

Answering the requests of Nohili

U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park Geophysical Observatory Real Estate

Environmental Impact Statement

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in the environmental planning process.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawaiʻi lands on Kauaʻi for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawaiʻi land on Kauaʻi for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

The Navy and NASA will host public scoping meetings at three locations on Kauaʻi. Attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this planning process. Meetings will be held from 5 to 8 p.m. HST at the following locations:

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Wednesday, June 5, 2024
Kekaha Neighborhood Center, 8130 Elepaio Rd., Kekaha

Thursday, June 6, 2024
Sheraton Kauaʻi Coconut Beach Resort, 650 Aleka Loop, Kapaʻa

Agenda:

5 to 8 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.

6 to 6:30 p.m.
Project presentation by Navy and NASA.

For more information, visit PMRF-KPGO-EIS.com

Naval Facilities Engineering Systems Command, Hawai'i
Environmental OPHEV2
Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Public Comment Period

The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawai'i Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental review process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

The public scoping period begins ***May 8, 2024*** and ends ***June 17, 2024.*** Please attend a public scoping meeting and visit the project website to learn more.

For language assistance or special accommodations, contact the PMRF Public Affairs Officer at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Submit Comments in Person, Online, or by Mail

Submit comments by ***June 17, 2024.***
The public may submit comments in any of the following ways:

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- Through the project website at PMRF-KPGO-EIS.com
- By email to info@PMRF-KPGO-EIS.com
- By mail, postmarked by ***June 17, 2024*** to the following address:
  Naval Facilities Engineering Systems Command, Hawai'i
  Environmental OPHEV2
  Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

The Navy and NASA propose to evaluate potential environmental impacts to the following resource areas. The public is invited to provide input on these and other resources that should be considered in the EIS.

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Biological Environment

- Biological resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

Attachment F

PMRF KPGO
Real Estate EIS
Mailing List

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	**Category**	**Prefix**	**First**	**Last**	**Title**	**Organization Name**	**Address 1**	**Address 2**	**City**	**State**	**Zip**	**Phone**	**Email**	**Notes**	**NOI Letter**	**NOI Postcard**
28	04 - Federal Agency	Ms.	Heather	Tonneson	Refuge Manager, National Wildlife Refuge System	Kaua'i National Wildlife Refuge Complex	P.O. Box 1128		Kīlauea	HI	96754	808-828-1413 x2223		Added from Navy stakeholder list		X
97	08 - Environmental organizations and other NGOs - R	Ms.	Rayne	Regush		Sierra Club of Hawai'i, Kaua'i Group							RAYNEREGUSH@aol.com	Added from Navy stakeholder list		X
104	09 - Environmental organizations and other NGOs - Local					Kaua'i Monk Seal Watch Program	P.O. Box 1836		Koloa	HI	96756			Added from Navy stakeholder list		X
121	10 - Native Hawai'ian Organizations and Cultural Centers - Local					Hui Mālama Polihale							huimalamapolihale@gmail.com	Added from One Kaua'i list		X
122	10 - Native Hawai'ian Organizations and Cultural Centers - Local					The Children of the Land	4-831 Kuhio Hwy.		Kapa'a	HI	96746	808-821-1234		Added from Navy stakeholder list		X
136	12 - Schools/Universities	Ms.	Margaret	Sanchez	Interim Chancellor	Kaua'i Community College	3-1901 Kaumualii Hwy.		Līhu'e	HI	96766	(808) 245-8283	masanche@hawaii.edu			X
137	12 - Schools/Universities	Ms.	Tia	Koerte	Director	Ke Kula Ni'ihau O Kekaha Public Charter School	P.O. Box 129		Kekaha	HI	96752	(808) 337-0481				X
138	12 - Schools/Universities	Mr.	Joseph	Hicks	Principal	Kekaha Elementary School	P.O. Box 580		Kekaha	HI	96752	(808) 337-7655				X
139	12 - Schools/Universities	Ms.	Hedy	Sullivan	Principal	Kula Aupuni Ni'ihau A Kahelelani Aloha Public Charter School	P.O. Box 610		Kekaha	HI	96752	(808) 337-2022				X
140	12 - Schools/Universities	Mr.	Daniel	Hamada	Principal	Ni'ihau High and Elementary School	C/O Department of Education, Kaua'i Complex Area Office 3060 Eiwa Street	Suite 305	Līhu'e	HI	96766	(808) 274-3502	daniel.hamada@k12.hi.us	Mr. Hamada is also the contact for the entire Kaua'i District, so there is no separate entry for that entity (Kaua'i District, Waimea Complex).		X
141	12 - Schools/Universities	Ms.	Wendy	Castillo	Principal	St. Theresa School	P.O. Box 277		Kekaha	HI	96752	(808) 337-1351	office@sttheresakauai.com			X
142	12 - Schools/Universities	Dr.	Robin	Tinghitella		University of Hawai'i Kaua'i Agricultural Research Center	7370-A Kuamo'o Road		Kapa'a	HI	96746	(808) 822-4984	lihue@ctahr.hawaii.edu			X
143	12 - Schools/Universities	Dr.	Shaya	Honarvar	Director	University of Hawai'i Pacific Cooperative Studies Unit	3190 Maile Way		Honolulu	HI	96822-2279	(808) 956-0808	honarvar@hawaii.edu			X
144	12 - Schools/Universities	Mr.	Ray	Carvalho	Interim Principal	Waimea Canyon Middle School	9555 Huakai Rd.		Waimea	HI	96796	(808) 338-6830 ext. 102				X
145	12 - Schools/Universities	Ms.	Mahina	Anguay	Principal	Waimea High School	P.O. Box 339		Waimea	HI	96796	(808) 338-6800	Mahina.Anguay@k12.hi.us			X
146	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests				President	Hanapepe Economic Alliance	4111 Noho Rd.	Suite A	Koloa	HI	96756			Added from Navy stakeholder list		X
147	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests					Kānehūnāmoku Voyaging Academy	47-705 Kamehameha Hwy.	Unit A	Kāne'ohe	HI	96744	808-286-4176	info@kanehunamoku.org	Added from Navy stakeholder list		X
148	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Mr.	Mark	Perriello	President/CEO	Kaua'i Chamber of Commerce	4268 Rice Street		Līhu'e	HI	96766	(808) 245-7363	mark@kauaichamber.org			X
149	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Ms.	Laurie	Yoshida	Chairman	Kaua'i Economic Development Board	P.O. Box 3921		Līhu'e	HI	96766	808-245-6692	info@kedb.com	Added from Navy stakeholder list		X
150	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Ms.	Cyndi	Ayonon	President	Kaua'i Filipino Chamber of Commerce	P.O. Box 3618		Līhu'e	HI	96766	(808) 645-6343	info@kauaifilipinochamber.org			X
151	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Mr.	Allan	Smith	Chairman	Kaua'i Island Utility Cooperative	4463 Pahee St.	Suite 1	Līhu'e	HI	96766	808-246-4300	info@kiuc.coop	Added from Navy stakeholder list		X
152	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests					Kaua'i Sea Rider Adventure Tours	3417 Po'ipū Rd., #105	P.O. Box 853	Kōloa	HI	96756	808-742-7422	reservations+ksr@islandactivitygroup.com	Added from Navy stakeholder list		X
153	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Ms.	Sue	Kanoho	Executive Director	Kaua'i Visitors Bureau	4473 Pahe'e Street	Suite F	Līhu'e	HI	96766	(808) 245-3971	kauai@hvcb.org			X
154	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests					Kekaha Agriculture Association	8297 Kekaha Rd.		Kekaha	HI	96752	808-337-9262		Added from Navy stakeholder list		X
155	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests					Kōke'e Lodge	P.O. Box 565		Waimea	HI	96796	(808) 335-6061	info@kokeelodge.com			X
156	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Mr.	Mark	Paikuli-Stride		Luluku Farmer's Association	45-559c Luluku Rd.		Kāne'ohe	HI	96744			Added from Navy stakeholder list		X
157	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests					The Cabins at Kōke'e, Akamai Hawaii Properties	P.O. Box 1198		Waimea	HI	96796	(808) 652-6852				X
158	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Mr.	Eric	Nordmeire		West Kaua'i Business and Professional Association	P.O. Box 903		Waimea	HI	96796					X
159	13 - Small business associations, economic development/ tourism organization, and recreational and real estate interests	Ms.	Renaé	Hamilton-Cambeilh	Executive Director	YWCA Kaua'i Camp Sloggett	3094 Elua Street		Līhu'e	HI	96766	(808) 245-5959 ext. 236	director@ywcakauai.org	The YWCA owns Camp Sloggett.		X
160	14 - Fishing/Diving	Capt.	Rob	McGuckin	President	Hawai'i Big Game Fishing Club	P.O. Box 471		Kailua-Kona	HI	96745	(808) 329-8252	info@hbgfc.org			X
161	14 - Fishing/Diving	Mr.	Lance	Marugame		Hawai'i Freshwater Fishing Association	330 Walker Ave.		Wahiawa	HI	96786	(808) 927-3264	hffabass@gmail.com lmmarugame@hotmail.com			X
162	15 - Community planning groups, and other community and civic organizations	Ms.	Emma Emalia	Keohokalole	Secretary-Treasurer	'Ohana Keohokālole	P.O. Box 565		Kāne'ohe	HI	96744	808-371-3398	eek4@hawaii.edu	Added from Navy stakeholder list		X
163	15 - Community planning groups, and other community and civic organizations	Mr.	Lewellyn 'Billy'	Kaohelaulii		Aha Moku Council Kaua'i - Mano O Kalanipo	2249 Kuai Rd.		Kōloa	HI	96756	808-742-9575	terriehayes@gmail.com	Added from Navy stakeholder list		X
164	15 - Community planning groups, and other community and civic organizations					Ahahui Kiwila Hawai 'i O Mo'ikeha	P.O. Box 1383		Kilauea	HI	96754			Added from Navy stakeholder list		X
165	15 - Community planning groups, and other community and civic organizations	Mr.	Donovan Andrew	Lazarus	State Commander	AMVETS Department of Hawai'i	P.O. Box 2865		'Ewa Beach	HI	96706	(808) 888-0410 main (808) 382-6835 direct	admin@amvets-hawaii.org (main) donovan@amvets-hawaii.org (direct)			X
166	15 - Community planning groups, and other community and civic organizations					Boys and Girls Club, West Kaua'i	4590 Ola Rd.		Waimea	HI	96796	808-320-8353		Added from Navy stakeholder list		X
167	15 - Community planning groups, and other community and civic organizations					Church of Jesus Christ of Latter-Day Saints	4580 Ehiku St.		Līhu'e	HI	96766	808-425-7010		Added from Navy stakeholder list		X
168	15 - Community planning groups, and other community and civic organizations	Ms.	Roslyn	Cummings		E Ola Kākou Hawai 'i	P.O. Box 315		Kalāheo	HI	96741	808-652-9918	mana.eolakakouhawaii@gmail.com	Added from Navy stakeholder list		X
169	15 - Community planning groups, and other community and civic organizations					E Ola Mau Na Leo O Kekaha	8130 Elepaio Rd.		Kekaha	HI	96752			Added from One Kaua'i list		X
170	15 - Community planning groups, and other community and civic organizations	Ms.	Mahealani	Cypher	Descendent	George K. Cypher 'Ohana	c/o Denise e DeCosta 45-342 Lilipuna Rd.	#308	Kāne'ohe	HI	96744	808-226-4195	jhd6@hawaii.edu	Added from Navy stakeholder list		X
171	15 - Community planning groups, and other community and civic organizations				President	Hanalei Hawaiian Civic Club	P.O. Box 68		Hanalei	HI	96714	808-639-4048		Added from Navy stakeholder list		X
172	15 - Community planning groups, and other community and civic organizations	Mr.	Micah	Kāne	Chief Executive Officer & President	Hawai'i Community Foundation	4268 Rice Street	Suite K	Līhu'e	HI	96766	(808) 245-4585				X
173	15 - Community planning groups, and other community and civic organizations					Hawai'i Health Systems Corp. Kaua 'i Region	P.O. Box 669		Waimea	HI	96796			Added from Navy stakeholder list		X

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1	Category	Prefix	First	Last	Title	Organization Name	Address 1	Address 2	City	State	Zip	Phone	Email	Notes	NOI Letter	NOI Postcard
174	15 - Community planning groups, and other community and civic organizations		Dawn N.S.	Chang, Esq.	Chair	Hoʻokano Family Land Trust	P.O. Box 6280		Kāneʻohe	HI	96744	808-539-3583	dnschang@kuiwalu.com	Added from Navy stakeholder list. However, Ms. Chang is already on this mailing list for two other organizations.		X
175	15 - Community planning groups, and other community and civic organizations					Hoʻōla Lāhui Hawaiʻi	4491 Rice St.		Līhuʻe	HI	96766	808-240-0100	info@hoolalahui.org	Added from Navy stakeholder list		X
176	15 - Community planning groups, and other community and civic organizations	Mr.	Presley	Wann	President	Hui Makaʻāinana O Makana	P.O. Box 1225		Hanalei	HI	96714		info@huimakaainanaomakana.org			X
177	15 - Community planning groups, and other community and civic organizations	Mr.	Jonathan Kānekoa	Kukea Shultz	Executive Director	Kākoʻo ʻŌiwi	P.O. Box 5307		Kāneʻohe	HI	96744	808-741-3403	info@kakooiwi.org	Added from Navy stakeholder list		X
178	15 - Community planning groups, and other community and civic organizations	Mr.	Mark	Hubbard	Chair	Kauaʻi Planning & Action Alliance	2959 Umi Street	Suite 201	Līhuʻe	HI	96766	(808) 632-2005	kpaa@kauainetwork.org			X
179	15 - Community planning groups, and other community and civic organizations	Dr.	Sarah	Styan	Founder, President & CEO	Kauaʻi Community Science Center	P.O. Box 60		Waimea	HI	96796	808-431-4332	info@kauaicsc.org	Added from Navy stakeholder list		X
180	15 - Community planning groups, and other community and civic organizations	Ms.	Malia	Nobrega-Olivera		Kauaʻi Council of the Association of Hawaiian Civic Clubs	Moku o Manokalanipō PO Box 383		Hanapēpē	HI	96716		malianob@gmail.com	Added from Navy stakeholder list		X
181	15 - Community planning groups, and other community and civic organizations	Ms.	Lynn Maile	Taylor	President and CEO	Kauaʻi Sea Farm	P.O. Box 746		Kalāheo	HI	96741	808-645-0527	info@kauaiseafarm.com	Added from Navy stakeholder list		X
182	15 - Community planning groups, and other community and civic organizations					Kekaha Host Benefits Program Citizen Action Committee.							info@kekahahcb.net	Added from One Kauaʻi list		X
183	15 - Community planning groups, and other community and civic organizations	Mr.	Jose	Felix-Keamoai	President	Kekaha Pop Warner	c/o Kauaʻi Pop Warner P.O. Box 1264		Lāwaʻi	HI	96765	808-651-6573	josefelix808@gmail.com	Added from Navy stakeholder list		X
184	15 - Community planning groups, and other community and civic organizations					Kilauea Community Agricultural Center - Aina Hoʻokupu O Kilauea	P.O. Box 1023		Kīlauea	HI	96754	(808) 652-1857	nfo@ainahookupuokilauea.org			X
185	15 - Community planning groups, and other community and civic organizations	Ms.	D. Ululani	Bierne-Keawe	Pelekikena	Koʻolauloa Hawaiian Civic Club	P.O Box 532		Hauʻula	HI	96717	808-548-9774	Khcc532@gmail.com	Added from Navy stakeholder list		X
186	15 - Community planning groups, and other community and civic organizations	Mr.	Charles	Naumu	President	Koʻolaupoko Hawaiian Civic Club	P. O. Box 664		Kāneʻohe	HI	96744		KoolaupokoHCC@gmail.com	Added from Navy stakeholder list		X
187	15 - Community planning groups, and other community and civic organizations		Kevin K.J.	Chang, Esq.	Executive Director	Kuaʻāina Ulu ʻAuamo	47-200 Waiheʻe Rd.	c/o Key Project	Kāneʻohe	HI	96744	808-672-2545	info@kuahawaii.org	Added from Navy stakeholder list		X
188	15 - Community planning groups, and other community and civic organizations					KVMH Auxiliary Association	P.O. Box 337		Waimea	HI	96796	808-338-9488		Added from Navy stakeholder list		X
189	15 - Community planning groups, and other community and civic organizations		Lani	Maʻa Lapilio, Esq.		Maʻa ʻOhana	P.O. Box 6087		Kāneʻohe	HI	96744	808-540-5741	lani@aukahi.com	Added from Navy stakeholder list		X
190	15 - Community planning groups, and other community and civic organizations	Mr.	Kamealoha	Smith	Board Member	Mahamoku Ohana Council	P.O. Box 510015		Keālia	HI	96751	808-212-4356	khs96703@gmail.com	Added from Navy stakeholder list		X
191	15 - Community planning groups, and other community and civic organizations					Malama Anahola	P.O. Box 7		Anahola	HI	96703			Added from Navy stakeholder list		X
192	15 - Community planning groups, and other community and civic organizations	Ms.	Sara	Bowen	Executive Director	Mālama Hulēʻia	P.O. Box 662092		Līhuʻe	HI	96766	808-626-5210	sara.ed@malamahuleia.org	Added from Navy stakeholder list		X
193	15 - Community planning groups, and other community and civic organizations	Ms.	Abigail K.	Nishida		Na Kuʻauhau ʻo Kahiwakaneikopolei	P.O. Box 5411		Kāneʻohe	HI	96744			Added from Navy stakeholder list		X
194	15 - Community planning groups, and other community and civic organizations	Mr.	Noa	Mau-Espirito		Na Mookupuna O Wailua	6200 Olohena Rd.	Unit A	Kapaʻa	HI	96746	808-855-5575	nkeliiua@gmail.com	Added from Navy stakeholder list		X
195	15 - Community planning groups, and other community and civic organizations		Keith & Bruce	Robinson		Niʻihau – Niʻihau O Kahele Lani	P.O. 232		Kaumakani	HI	96747	808-335-3500	niihauisland@hawaiiantel.net	Added from Navy stakeholder list		X
196	15 - Community planning groups, and other community and civic organizations	Ms.	Liberta	Albao		Queen Deborah Kapule Hawaiian Civic Club	P.O. Box 164		Kapa'a	HI	96746			Added from Navy stakeholder list		X
197	15 - Community planning groups, and other community and civic organizations					Ruff Ryderz Baseball	9555 Huakai Rd.		Waimea	HI	96796	808-651-5250	ruffryderzbaseballkauai@gmail.com	Added from Navy stakeholder list		X
198	15 - Community planning groups, and other community and civic organizations	Ms.	Robin Puanani	Danner	Chairman	Sovereign Councils of the Hawaiian Homestead Associations	P.O. Box 646		Anahola	HI	96703	808-431-4067	info@hawaiianhomesteads.org	Added from Navy stakeholder list		X
199	15 - Community planning groups, and other community and civic organizations	Rev. Fr.	Edwin	Conselva	Pastor	St. Theresa Catholic Church	P.O. Box 159	8355 Kaumualii Hwy.	Kekaha	HI	96752	808-337-1548		Added from Navy stakeholder list		X
200	15 - Community planning groups, and other community and civic organizations	Mr.	Lance Kamuela	Gomes	Konohiki Chief	Wahiawa Ahupuaa LCA 7714B Apana 6 RP 7813	P.O. Box 382		Kalāheo	HI	96741	808-631-1737	kamuela@live.com	Added from Navy stakeholder list		X
201	15 - Community planning groups, and other community and civic organizations	Mr.	Jesse	Cummings		Wai Koa Kauaʻi	P.O. Box 315		Kalāheo	HI	96741	808-651-1468	jessekekoacummings@yahoo.com	Added from Navy stakeholder list		X
202	15 - Community planning groups, and other community and civic organizations					Waimea Theater	9691 Kaumualii Hwy.		Waimea	HI	96796	808-338-0282		Added from Navy stakeholder list		X
203	15 - Community planning groups, and other community and civic organizations	Mr.	Mike	Faye	President	West Kauaʻi (Waimea) Rotary	9852 Kaumualii Hwy.		Waimea	HI	96796	808-639-3900		Added from Navy stakeholder list		X
204	15 - Community planning groups, and other community and civic organizations					West Kauaʻi Lions Organization	P.O. Box 665		Hanapēpē	HI	96716			Added from Navy stakeholder list		X
205	15 - Community planning groups, and other community and civic organizations				Pastor	West Kauaʻi United Methodist Church	P.O. Box 298		Kekaha	HI	96752	808-337-1464	westkauaiumc@gmail.com	Added from Navy stakeholder list		X
206	15 - Community planning groups, and other community and civic organizations					Westside Christian Center	8041 Kekaha Rd.		Kekaha	HI	96752			Added from One Kauaʻi list		X
208	16 - Boating/Yacht Clubs/Marinas					Blue Dolphin Charters	Port Allen Marina Center 4353 Waialo Road	7B	ʻEleʻele	HI	96705	(808) 335-5553				X
209	16 - Boating/Yacht Clubs/Marinas	Captain	Andy			Captain Andy's	P.O. Box 876		ʻEleʻele	HI	96705	(808) 335-6833	fun@napali.com	Could not locate last name, but operator is named Andy.		X
210	16 - Boating/Yacht Clubs/Marinas	Mr.	Lani	Swain	Captain	Catamaran Kahanu	4353 Waialo Road		ʻEleʻele	HI	96705	(808) 645-6176	captainkahanu@gmail.com			X
211	16 - Boating/Yacht Clubs/Marinas					Holo Holo Charters	P.O. Box 50940		ʻEleʻele	HI	96705	(808) 335-0815	reservations@holoholocharters.com			X
212	16 - Boating/Yacht Clubs/Marinas					Kauaʻi Sailing Association	P.O. Box 3786		Lihuʻe	HI	96766	(808) 346-6051	kauaisailing@gmail.com			X
213	16 - Boating/Yacht Clubs/Marinas					Kauaʻi Sea Tours	4353 Waialo Road	2B	ʻEleʻele	HI	96705	(808) 335-5309	info@kauaiseatours.com			X
214	16 - Boating/Yacht Clubs/Marinas					Kikiaola Westside Boaters Club	P.O. Box 986		Kekaha	HI	96796			Added from Navy stakeholder list		X
215	16 - Boating/Yacht Clubs/Marinas					Makana Charters	4516 Alawai Road		Waimea	HI	96796	(808) 338-9980	info@makanacharters.com			X
216	16 - Boating/Yacht Clubs/Marinas	Mr.	Brandon	Elsasser	Captain	Nā Pali Riders	9600 Kaumualiʻi Highway		Waimea	HI	96796	(808) 742-6331	napaliriderskauai@gmail.com			X
217	16 - Boating/Yacht Clubs/Marinas	Mr.	Aaron	Taylor	Captain	Napali Odyssey	Kīkiaola Small Boat Harbor 2494 Niumalu Road		Lihuʻe	HI	96766	(808) 652-0823	napaliodyssey@gmail.com	Address is for the harbor where the boat is; no address found for the business. Potential addresses for business 335 ʻAina Lani Pl, Kapaʻa, HI 96746		X
218	16 - Boating/Yacht Clubs/Marinas	Mr.	Jeff	Jakus	Commodore	Nawiliwili Yacht Club	P.O. Box 3661		Lihuʻe	HI	96766	(808) 264-4845	commodore@nawiliwiliyachtclub.org			X
219	16 - Boating/Yacht Clubs/Marinas					Seasport Divers	2827 Poipu Road		Koloa	HI	96756	(808) 742-9303				X
220	16 - Boating/Yacht Clubs/Marinas					West Side Boaters Association										X
221	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Lyle	Tabata	Partner/RME	B&T Contractors, LLC	P.O. Box 662111		Lihu'e	HI	96766					X
222	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Darryl	Kua	Pastor	Westside Christian Center Assembly of God	P.O. Box 593		Kekaha	HI	96752	(808) 482-1717				X
223	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Dennis	Eguchi												X

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1	**Category**	**Prefix**	**First**	**Last**	**Title**	**Organization Name**	**Address 1**	**Address 2**	**City**	**State**	**Zip**	**Phone**	**Email**	**Notes**	**NOI Letter**	**NOI Postcard**
224	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Ms.	Marissa	Faye												X
225	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Charlie	Iona												X
226	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Ms.	Alethea	Kaohi & Ohana												X
227	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Ms.	Tia	Koerte										Already listed above as the director of a school.		X
228	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Terry	Lily	Biologist											X
229	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.		Kaua	Mata												X
230	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Josh	Mori												X
231	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Ms.	Keiko	Napier												X
232	17 - Individual community members (not associated with groups) interested in cultural and natural resources preservation, military use of the land, public access, etc.	Mr.	Toni	Ricci												X
233	18 - PMRF civilian and contract employees: Navy to send an All Hands message															X
301	20 - Libraries				Branch Manager	Hanapēpē Public Library	4490 Kona Rd		Hanapēpē	HI	96716					X
302	20 - Libraries				Branch Manager	Hawai'i State Library	478 S King St		Honolulu	HI	96813					X
303	20 - Libraries				Branch Manager	Kapa'a Public Library	4-1464 Kuhio Hwy		Kapa'a	HI	96746					X
304	20 - Libraries				Branch Manager	Koloa Public and School Library	3451 Poipu Rd		Koloa	HI	96756					X
305	20 - Libraries				Branch Manager	Lihu'e Public Library	4344 Hardy St		Lihu'e	HI	96766					X
306	20 - Libraries				Branch Manager	Princeville Public Library	4343 Emmalani Dr		Princeville	HI	96722			Temporarily Closed		X
307	20 - Libraries				Branch Manager	Waimea Public Library (Kaua'i)	9750 Kaumualii Hwy		Waimea	HI	96796					X

Attachment G

U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park
Geophysical Observatory Real Estate Environmental Impact Statement

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in the environmental planning process.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawaiʻi lands on Kauaʻi for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawaiʻi land on Kauaʻi for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

The Navy and NASA will host public scoping meetings at three locations on Kauaʻi. Attend any of the public **scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this** planning process. Meetings will be held from 5 to 8 p.m. HST at the following locations:

PUBLIC SCOPING MEETINGS

Tuesday, June 4, 2024	Wednesday, June 5, 2024	Thursday, June 6, 2024
Kauaʻi Veterans Center **3215 Kauaʻi Veterans Memorial Hwy,** **Līhuʻe**	**Kekaha Neighborhood Center** **8130 Elepaio Road,** **Kekaha**	**Sheraton Kauaʻi Coconut Beach Resort** **650 Aleka Loop,** **Kapaʻa**

AGENDA

5 to 8 p.m.	6 to 6:30 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.	**Project presentation by Navy and NASA.**

The Navy and NASA are initiating a public scoping period under the National Environmental Policy Act and Hawaiʻi Revised Statutes (HRS) Chapter 343 to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and HRS Section 6E-42. Your voice is important to this planning process.

The public scoping period begins *May 8, 2024, and ends June 17, 2024*. Please attend a public scoping meeting and visit the project website to learn more. For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil. Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

Submit Comments in Person, Online, or by Mail. Submit comments by *June 17, 2024*. The public may submit comments in any of the following ways: In person at a public scoping meeting, through the project website at PMRF-KPGO-EIS.com, by email to info@PMRF-KPGO-EIS.com, or by mail, postmarked by *June 17, 2024* to the following address: Naval Facilities Engineering Systems Command, Hawaiʻi, Environmental OPHEV2, Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells, 400 Marshall Road, Building X-11, Pearl Harbor, HI 96860.

For more information visit PMRF-KPGO-EIS.com

Attachment H

OFFICE OF PLANNING AND SUSTAINABLE DEVELOPMENT

The Environmental Notice

May 8, 2024

Josh Green, M.D., Governor
Mary Alice Evans, OPSD Director

The Environmental Notice provides public notice for projects undergoing environmental review in Hawai'i as mandated under Section 343-3, Hawai'i Revised Statutes, the Environmental Impact Statement Law. Along with publishing Environmental Assessments and Environmental Impact Statements for projects in Hawai'i, *The Environmental Notice* also includes other items related to the shoreline, coastal zone, and federal activities.

Engineered, uncemented rock revetments such as this may provide temporary protection and stability to sections of Kamehameha Hwy in windawrd O'ahu

Photo from project's Draft EA

235 South Beretania Street, Suite 702 • Honolulu, Hawai'i 96813 • (808) 586-4185 • dbedt.opsd.erp@hawaii.gov • https://planning.hawaii.gov/erp/

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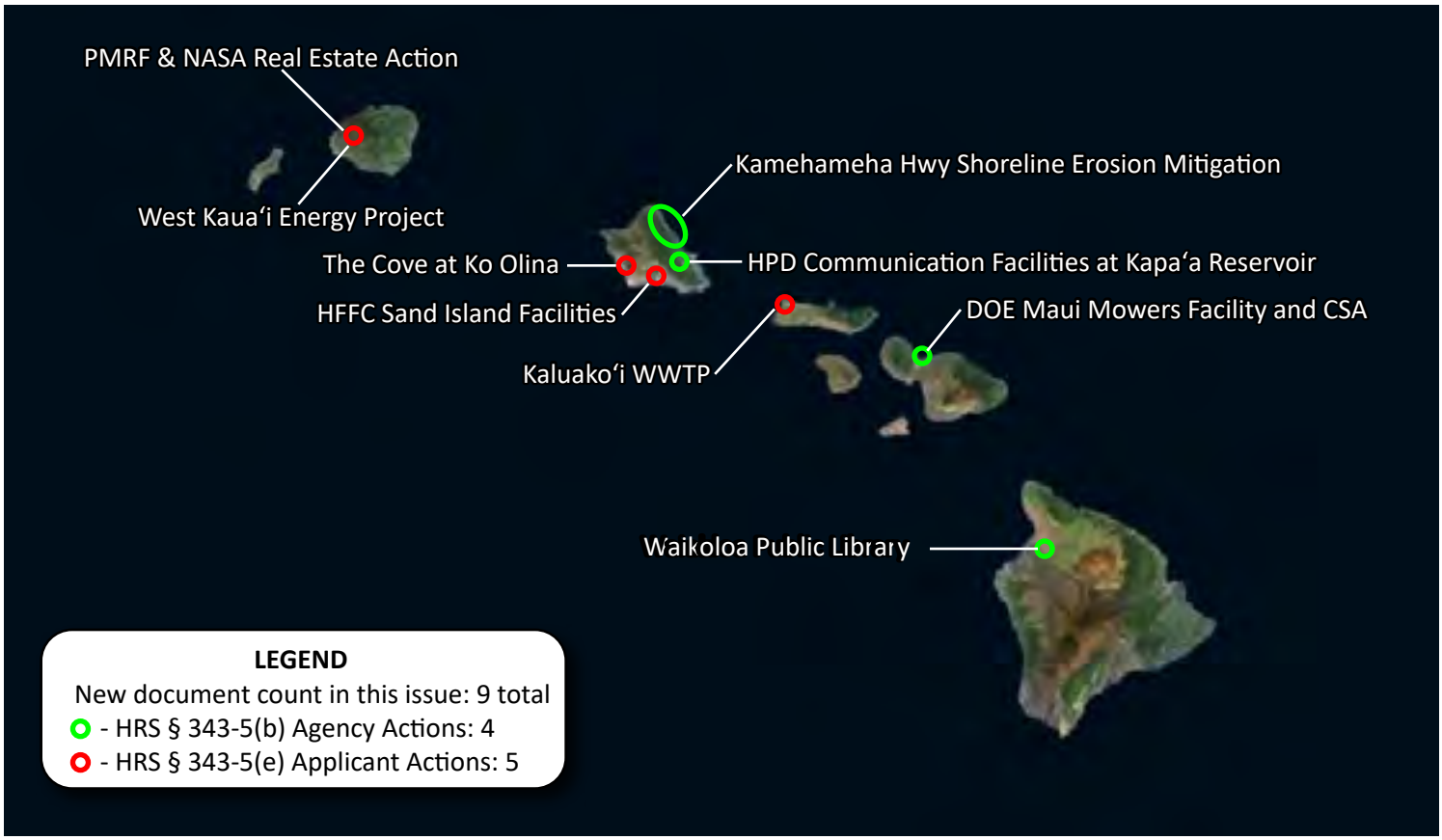

Kauaʻi EAs/EISs

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Action--(EISPN)

HRS §343-5(a) Triggers	(1) Propose the use of state or county lands or the use of state or county funds (2) Propose any use within any land classified as a conservation district
District(s)	Waimea
TMK(s)	Numerous (see document)
Permit(s)	Numerous (see document)
Approving Agency / Accepting Authority	State of Hawai'i, Department of Land and Natural Resources Russell Tsuji, (808) 587-0419, dlnr.land@hawaii.gov 1151 Punchbowl Street, Room 220, Honolulu, HI 96813
Applicants	US Department of the Navy; 400 Marshall Road, Building X-11, Pearl Harbor, HI 96860 Kerry Wells, (808) 473-0662, info@PMRF-KPGO-EIS.com US National Aeronautics and Space Administration, Goddard Space Flight Center, 34200 Fulton St., Wallops Island, VA 23337 Shari Miller, (757) 824-2327, Shari.A.Miller@nasa.gov
Consultant	Cardno GS-AECOM Pacific Joint Venture; 737 Bishop Street, Suite 3050, Honolulu, HI 96813 Michele Lefebvre, (808) 791-9872, info@PMRF-KPGO-EIS.com
Status	Administrative public review and comment period starts. Comments are due by June 17, 2024. Please address comments to the approving agency/accepting authority at info@PMRF-KPGO-EIS.com. EIS Public Scoping meetings will be held: June 4, 2024 - 5:00–8:00 p.m. at the Kauaʻi Veterans Center in Līhuʻe (3215 Kauaʻi Veterans Memorial Highway, Līhuʻe) June 5, 2024 - 5:00–8:00 p.m. at the Kekaha Neighborhood Center (8130 Elepaio Road, Kekaha) June 6, 2024 - 5:00–8:00 p.m. at the Sheraton Kauaʻi Coconut Beach Resort (650 Aleka Loop, Kapaʻa)

The Navy proposes to retain the use of 8,348 acres of State lands on Kauaʻi, Hawaiʻi, for operational continuity and sustainment (in support of continued military training, testing, and facility operations) at Pacific Missile Range Facility (PMRF). NASA proposes to retain the use of 23 acres of State lands on Kauaʻi, Hawaiʻi, in support of continued operations including measurements of the Earth's rotation and local land motion at Kōkeʻe Park Geophysical Observatory (KPGO). A similar entry for a federal Notice of Intent to prepare the joint HEPA/NEPA EIS is expected to be published in the Federal Register on May 9, 2024. The public scoping processes will run concurrently.

West Kauaʻi Energy Project--Withdrawal of FONSI and Final & Draft EAs

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds (2) Propose any use within any land classified as a conservation district
District(s)	Kauaʻi-multiple
TMK(s)	(4) 1-2-001: 003, 007; 1-2-002: 001, 016, 018, 019, 023; 1-4-001: 002, 003, 013, 014; 1-4-002: 008, 035, 036, 048, 066, 067, 068, 085
Permit(s)	Various (see EA)
Approving Agency	State of Hawai'i, Department of Land and Natural Resources Lauren Yasaka, (808) 587-0431, lauren.e.yasaka@hawaii.com 1151 Punchbowl Street, Room 220, Honolulu, HI 96813
Applicant	Kauaʻi Island Utility Cooperative and AES West Kauaʻi Energy Project, LLC; 4463 Paheʻe Street, Suite 1, Līhuʻe, HI 96766 Dawn Huff, (360) 483-6488, admin@joulegroup.com
Consultant	n/a
Status	The approving agency is withdrawing the Draft EA (published 8/23/2021), 2nd Draft EA (published 9/8/2022), and Final EA & FONSI for the subject action.

Pursuant to a Stipulation and Order that was filed in First Circuit Court on March 28, 2024, regarding Civil No. 1CCV-23-0000165(SMK), the Department of Land and Natural Resources requests the withdrawal of the Draft Environmental Assessments (EA), Final EA, and Finding of No Significant Impact (FONSI) determination for the West Kauaʻi Energy Project.

O'AHU EAs/EISs

Kamehameha Highway Shoreline Erosion Mitigation in NE O'ahu--Draft EA (AFNSI)

HRS §343-5(a) Triggers	(1) Propose the use of state or county lands or the use of state or county funds (2) Propose any use within any land classified as a conservation district (3) Propose any use within a shoreline area
District(s)	Ko'olauloa
TMK(s)	Numerous (see document)
Permit(s)	Numerous (see document)
Proposing/ Determining Agency	State of Hawai'i, Department of Transportation Mel Chung, (808) 832-3405, mungfa.chung@hawaii.gov 869 Punchbowl Street, Honolulu, HI 96813-5097
Consultant	AECOM; 1001 Bishop Street, Suite 1600, Honolulu, HI 96813 Courtney Hymes, (808) 529-7297, courtney.cacace@aecom.com
Status	Statutory 30-day public review and comment period starts. Comments are due by June 7, 2024. Please click on title link above to read the document, then send comments to the proposing/determining agency at courtney.cacace@aecom.com

The Kamehameha Highway Shoreline Erosion Mitigation in Kualoa, Ka'a'awa, Punalu'u, and Hau'ula Project would mitigate coastal erosion along nine discrete sections of the highway that the Hawai'i Department of Transportation has identified as needing action to maintain the usability of the highway in the near to mid-term, until a long-term plan to deal with the effects of sea level rise can be developed and implemented. The proposed action includes construction of rock revetments or hybrid seawalls with armor stone aprons at nine locations along the makai side of Kamehameha Highway.

The Cove at Ko Olina Redevelopment--Draft EIS Vol I, Vol II (Appendices), and public scoping meeting audio

HRS §343-5(a) Trigger	(3) Propose any use within a shoreline area
District(s)	'Ewa
TMK(s)	(1) 9-1-057:027
Permit(s)	Numerous (see document)
Approving Agency/ Accepting Authority	City and County of Honolulu, Department of Planning and Permitting Lena Phomsouvanh, (808) 768-8052, lena.phomsouvanh@honolulu.gov 650 South King Street, 7th Floor, Honolulu, HI 96813
Applicant	Cove Campbell Kobayashi LLC; 1288 Ala Moana Blvd., Suite 201, Honolulu, HI 96814 Matthew Pennaz, (808) 524-1508, mpennaz@kobayashi-group.com
Consultant	G70; 111 S. King Street, Suite 170, Honolulu, HI 96813 Tracy Camuso, (808) 523-5866, thecovekoolina@g70.design
Status	Statutory 45-day public review and comment period starts. Comments are due by June 24, 2024. Please send comments to the approving agency/accepting authority at thecovekoolina@g70.design

The Applicant, Cove Campbell Kobayashi LLC, proposes to redevelop the approximately 10.85-acre property located in the Ko Olina resort area of Kapolei, O'ahu. This will be the first major improvement of the property in over 25 years. The Project includes the replacement of dated structures and existing programming at the site with a new performing arts venue. The lū'au show will continue to be the focal point of the property. Improvements will also include ancillary uses, such as programming, restaurants, and retail, to create an authentic Hawaiian community gathering place that honors and reflects the history, culture, and connection to place.

O'AHU EAs/EISs (CONTINUED)

HPD Communication Facilities Upgrade at Kapa'a Reservoir--Final EA (FONSI)

HRS §343-5(a) Triggers	(1) Propose the use of state or county lands or the use of state or county funds (2) Propose any use within any land classified as a conservation district
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-017:016
Permit(s)	Conservation District Use Permit, Building Permit
Proposing/ Determining Agency	City and County of Honolulu, Department of Design and Construction Clyde Higa, (808) 768-8424, clyde.higa@honolulu.gov 650 South King Street, 11th Floor, Honolulu, HI 96813
Consultant	AGY LLC; 615 Pi'ikoi Street Suite 1806, Honolulu, HI 96814 Aolani Yamasato-Gragas, (808) 447-9849, aolani_y@yahoo.com
Status	Finding of No Significant Impact (FONSI) determination

The City and County of Honolulu Department of Design and Construction (DDC), Department of Information Technology (DIT), and Honolulu Police Department (HPD), intend to upgrade the public safety radio communication system at the Board of Water Supply (BWS) Kapa'a Reservoir parcel in Kāne'ohe, O'ahu. The existing communication facility, integral to Honolulu's emergency communications network, serves state, federal, and local public safety agencies. The facility prohibits public or commercial use. The project aims to replace one microwave truss tower with an 80-foot monopole tower able to withstand Category IV hurricanes, install a sidewalk, replace propane tanks with a single diesel tank, modify the building's interior, upgrade the generator, and upgrade the building and all critical appurtenances to withstand Category IV hurricanes. The proposed project involves approximately 305 square feet of improvements.

Hawaii Fueling Facilities Corporation Sand Island Facilities Upgrade Project--Final EA (FONSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	Honolulu
TMK(s)	(1) 1-2-025:020 & 021
Permit(s)	Special Management Area Major Permit, grading and building permits
Approving Agency	City and County of Honolulu, Department of Planning and Permitting Steve H. Tagawa, (808) 768-8024, stagawa@honolulu.gov 650 South King Street, Honolulu, HI 96813
Applicant	Hawaii Fueling Facility Corporation; 3201 Aolele Street, Honolulu, HI 96819 Jason Maga, (808) 833-3291, Jason.maga@signatureflight.com
Consultant	Burns & McDonnell; 833 Bishop Street, Suite 2150, Honolulu, HI 96813 Jeremy Jewell, (816) 601-4919, jjewell@burnsmcd.com
Status	Finding of No Significant Impact (FONSI) determination

The EPA-mandated upgrade to the secondary spill containment and storm water management system is for the Applicant's jet fuel storage facility at 6 Sand Island Access Road. The 8.4-acre facility, initially built in the 1960s, consists of 16 aboveground steel storage tanks, with a total capacity of 45 million gallons, is the sole supply of jet fuel for the Daniel K. Inouye International Airport. Jet fuel is transported to this facility via pipelines from the refinery in Kalaeloa (formerly Campbell Industrial Park). The Project involves soil excavation, new asphalt pavement & spray-on coating of exposed areas, 31 collection inlets, 4 lift stations with sump pumps and an above-ground oil-water separator. The site is on State-owned DOT land, which triggers the preparation of an EA per Chapter 343. The FONSI determination allows the SMA application to be accepted for processing by the Department of Planning and Permitting, with decision-making by the Honolulu City Council.

Maui EAs/EISs

Relocation of DOE Maui District Mowers Facility and Community School for Adults--Draft EA (AFNSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	Wailuku
TMK(s)	(2) 3-8-007:098
Permit(s)	HRS Chapter 6E, NPDES General Permit, County Grading Permit, Community Noise Permit, Building Permit, Roadway Permit, Water Use Permit, Sewage Connection
Proposing/ Determining Agency	State of Hawai'i, Department of Education Jenny Ho, (808) 784-5122, jenny.ho@k12.hi.us Facilities Development Branch, P.O. Box 2360, Honolulu, HI 96804
Consultant	Bowers and Kubota Consulting, Inc.; 2153 North King Street, Suite 200, Honolulu, HI 96819 Matthew Fernandez, (808) 836-7787, mfernandez@bowersandkubota.com
Status	Statutory 30-day public review and comment period starts. Comments are due by June 7, 2024. Please click on title link above to read the document, then send comments to the proposing/determining agency at mfernandez@bowersandkubota.com

The State of Hawai'i, Department of Education, Facilities Development Branch (DOE) is proposing to relocate and develop two new buildings on an undeveloped area within a larger State-owned property that is used by Maui High School. The project area would utilize approximately 2.2-acres of the 6.5-acres of the school property's undeveloped space.

The proposed DOE buildings are to be a new one-story building and parking lot for the Maui District Mowers Facility, and a new one-story building and parking lot for the McKinley School for Adults Maui Campus program. The Proposed Action will also involve constructing one new driveway to connect the new facilities to West Papa Avenue, landscaping, installation of fencing around the project site, and provide electrical, telecommunications, water, sewer, and drainage utilities and infrastructure to service the proposed facilities.

Moloka'i EAs/EISs

Replacement/Demolition of the Kaluako'i Wastewater Treatment Plant--Draft EA (AFNSI)

HRS §343-5(a) Trigger	(9)(A) Propose any wastewater treatment unit, except an individual wastewater system or a wastewater treatment unit serving fewer than fifty single-family dwellings or the equivalent
District(s)	Moloka'i
TMK(s)	(2) 5-1-003-008 (por.) and 024 (por.)
Permit(s)	Various (see document)
Approving Agency	County of Maui, Department of Planning on behalf of Moloka'i Planning Commission Sybil Lopez, (808) 270-7735, Sybil.Lopez@co.maui.hi.us 2200 Main Street, One Main Plaza, Suite 315, Wailuku, HI 96793
Applicant	Mosco, Inc.; P.O. Box 259, Maunaloa, HI 96770 Todd Svetin, (808) 552-2444, TSvetin@molokairanch.com
Consultant	Munekiyo Hiraga; 305 High Street, Suite 104, Wailuku, HI 96793 Mark Alexander Roy, (808) 244-2015, planning@munekiyohiraga.com
Status	Statutory 30-day public review and comment period starts. Comments are due by June 7, 2024. Please click on title link above to read the document, then send comments to the approving agency and copy the applicant and the consultant.

The proposed project consists of the construction of a new replacement Wastewater Treatment Plan (WWTP) and the demolition of the existing Kaluako'i WWTP as mandated by the State Department of Health. Once the replacement WWTP is operational, the existing Kaluako'i WWTP will be removed. The replacement WWTP will be designed with a treatment capacity of 102,000 Gallons Per Day (GPD) to service the community, a reduction of 58,000 GPD from the WWTP's original (160,000 GPD) capacity.

Hawai'i EAs/EISs

Waikoloa Public Library--Final EA (FONSI)

HRS §343-5(a) Trigger	(1) Propose the use of state or county lands or the use of state or county funds
District(s)	South Kohala
TMK(s)	(3) 6-8-041:020
Permit(s)	Chapter 343, HRS Compliance; Dust Control Plan; Noise Permit (if necessary); National Pollutant Discharge Elimination System (NPDES) construction site stormwater discharge permit; Americans with Disabilities Act (ADA) Compliance; Section 6E, HRS Review; Grading, Grubbing, and Stockpiling Permits; Building Permit (electrical, plumbing, civil); Certificate of Occupancy; and Plan Approval
Proposing/ Determining Agency	State of Hawai'i, Department of Accounting and General Services Brian Isa, (808) 586-0484, brian.s.isa@hawaii.gov 1151 Punchbowl Street, Room 430, Honolulu, HI 96810
Consultant	PBR HAWAII; 1001 Bishop Street, ASB Tower, Suite 650, Honolulu, HI 96813 Bradley Furuya, (808) 954-6348, bfuruya@pbrhawaii.com
Status	Finding of No Significant Impact (FONSI) determination

The proposed Project includes a new, approximately 12,000 square foot public library, approximately 3,000 square foot Early Learning Center (ELC), 71-stall surface parking lot, and complimentary landscaping. The proposed library includes shelving for a minimum of 50,000 books, private meeting rooms, a program room, a work room, support space, and a librarian's office. The ELC, connected to the library, will have two classrooms, each capable of accommodating roughly 20 students.

Previously Published Documents Open for Comment

Status: The comment period for these projects began previously. Please click on the links below to read a document, then send comments to the relevant agency and copy any relevant applicant and/or consultant identified in the submission form that follows the initial agency letter.

Comments Due May 8, 2024

Hawai'i

Hilo Medical Center New Administrative Services Building--Draft EA (AFNSI)

Maui

Honokōwai Water System Improvements--Draft EA (AFNSI)

O'ahu

Waimea Valley Economic Resiliency Project--Draft EA (AFNSI)

Comments Due May 23, 2024

Hawai'i

Hakalau Stream Bridge Rehabilitation--Draft EA (AFNSI)

Maui

Ledcor South Maui Properties and Improvements--Republished Draft EIS and scoping meeting audio

Please send comments to the approving agency/accepting authority at http://www.ledcorsouthmauipermitting.com.

Comments Due June 7, 2024

Hawai'i

Army Training Land Retention at Pōhakuloa Training Area--2nd Draft EIS Vol I, II, III, and scoping meeting audio

Maui

Air Force Maui Optical and Supercomputing (AMOS) Site Small Telescope Advanced Research Facility--EISPN

Lists of Exemption Notices

Pursuant to HAR § 11-200.1-17, State and county agencies that have determined specific actions to be exempt from the requirement to prepare an EA are required to submit a listing of such exemptions made during the previous month. Following are Lists of Exemption Notices submitted by various agencies for April 2024; contact the identified agency contact on each list for additional information about any specific exemption:

State of Hawaiʻi
Department of Accounting and General Services
Department of Education
Department of Land and Natural Resources

County of Hawaiʻi
Office of Housing and Community Development

County of Maui
Department of Public Works

City and County of Honolulu
Department of Transportation Services

Coastal Zone Management Notices

Federal Consistency Reviews

The following federal actions are being reviewed for consistency with the enforceable policies of the Hawaiʻi Coastal Zone Management (CZM) Program, including the CZM objectives and policies in Hawaiʻi Revised Statutes, Chapter 205A. Federal consistency, pursuant to Section 307 of the Coastal Zone Management Act of 1972 (CZMA), as amended, generally requires that federal actions, within and outside of the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved coastal management program. Federal actions include federal agency activities, federal license or permit activities, and federal financial assistance activities. This public notice is being provided in accordance with § 306(d)(14) of the CZMA, and federal regulations at 15 CFR § 930.2, § 930.42, and § 930.61. General information about federal consistency is available at the Hawaiʻi CZM Program web site, or call (808) 587-2878.

For specific information or questions about an action listed below, contact the CZM staff person identified for each action. The CZM Program is required to adhere to federal review deadlines, therefore, comments must be received by the date specified. Comments may be submitted by mail or electronic mail, to the addresses below.

Mail: Office of Planning and Sustainable Development
Department of Business, Economic Development and Tourism
P.O. Box 2359, Honolulu, HI 96804

Email: Debra.L.Mendes@hawaii.gov

County DPW Wilder Road Culvert Replacement Project

Proposed Action: Replace the existing drainage structure and eliminate the deteriorated conditions to ensure that the drainage system continues to convey the design storm water drainage flows from the surrounding area at South Wilder Road, in Kaūmana Ahupuʻa, Hilo, Hawaiʻi. The project involves the demolition of approximately 180 linear feet of existing dual, 96-inch diameter corrugated metal pipe culverts that pass under South Wilder Road, including demolition of above-ground road and walkway improvements, and replacement with two 8'x8' reinforced concrete box culverts and headwalls; restoration of approximately 82 linear feet of eroded protection in the downstream channel bottom with new grouted rubble pavement and cutoff wall; and reconstruction of road pavement, concrete walkway, guardrails and appurtenances.

Location: Kaūmana Stream at South Wilder Road, Hilo, Island of Hawiʻi
TMK(s): (3)2-5-045:999, (3)2-5-005:157 and (3)2-5-045:001, (3)2-5-005:158 and 159
Applicant: County of Hawaiʻi, Department of Public Works
Federal Action: Federal Permit
Federal Agency: U.S. Army Corps of Engineers
CZM Contact: Debra Mendes, (808) 587-2840, Debra.L.Mendes@hawaii.gov
Comments Due: May 22, 2024

Coastal Zone Management Notices (continued)

Special Management Area (SMA) Minor Permits

The SMA Minor permits below have been approved (HRS § 205A-30). For more information, contact the relevant county/state planning agency: Honolulu [(808) 768-8015]; Hawai'i [East (808) 961-8288], [West (808) 323-4770]; Kaua'i [(808) 241-4050]; Maui [(808) 270-7735]; Kaka'ako or Kalaeloa Community Development District [(808) 587-2846]

Location (TMK)	Description (File No.)	Applicant/Agent
Hawai'i: North Kohala District (5-3-007:047)	Establish Community Farm and Related Uses (PL-SMM-2024-000060)	Hale Ipu Kukui LLC
Kaua'i: Hanalei (5-5-001:042 Unit 1)	After-the-Fact Construction of a storage shed (SM(M)-2024-15)	Anthony Sutton
Maui: Kīhei (3-9-009:021)	Earhart Apartment Alteration. Enclose existing covered lanai and convert to living space (SM22024-00018)	Michelle Cockett
O'ahu: Kāne'ohe (4-6-001:009)	After-the-Fact Alterations of Three Single-Family Dwellings (2024/SMA-27)	Richard and Noreen Van Horn
O'ahu: Mokulē'ia (6-8-006:006) Parcel 6	Tang Ohana Unit Addition (2024/SMA-22)	Gordon Tang Family Trust

Shoreline Notices

Applications for Shoreline Certification

The shoreline certification applications below are available for review and comment at the Department of Land and Natural Resources offices on Kaua'i, Hawai'i, Maui, and Honolulu, 1151 Punchbowl Street, Room 220 (HRS § 205A-42 and HAR § 13-222-12). **Maps and photos of each application file can be viewed here**. All comments shall be submitted in writing to the State Land Surveyor, 1151 Punchbowl Street, Room 210, Honolulu, HI 96813 and postmarked no later than 15 calendar days from the date of this public notice of the application. For more information, contact Rebecca Anderson at rebecca.l.anderson@hawaii.gov

File No.	Location	TMK	Applicant	Owner
MA-825	4933 Uakea Road, Maui 96713	(2) 1-4-005:019	Kevin J. Clarke	Hana Aku LLC
MA-826	2780 Keka'a Drive, Maui 96761	(2) 4-4-008:007	Reed M. Ariyoshi	Royal Lahaina Owner LP

Proposed Shoreline Certifications and Rejections

The shoreline notices below have been proposed for certification or rejection by the Department of Land and Natural Resources (HRS § 205A-42 and HAR § 13-222-26). Any person or agency who wants to appeal shall file a notice of appeal in writing with DLNR no later than 20 calendar days from the date of this public notice. Send the appeal to the Board of Land and Natural Resources, 1151 Punchbowl Street, Room 220, Honolulu, Hawai'i 96813.

File No.	Status	Location	TMK	Applicant	Owner
OA-2051	Proposed	608 Kaimalino Place, O'ahu 96734	(1) 4-4-039:023	Ross K. Tanaka	Stuart Family Trust
OA-2052	Proposed	61-821 Papailoa Road, O'ahu 96712	(1) 6-1-004:097	Ross K. Tanaka	John D. and Marie-Niege H. S. Whittington
OA-2055	Proposed	55-119 and 55-113 Kamehameha Highway, O'ahu 967	(1) 5-5-001:013 & 056	Benjamin E. K. Guieb	Devin J. Moncur
OA-2090	Proposed	Kaluanui Stream Bridge, Kamehameha Highway, O'ahu 9677	(1) 5-3-009:047	ControlPoint Surveying, Inc.	City & County of Honolulu
OA-2098	Proposed	58-207 H Kamehameha Highway, O'ahu 9672	(1) 5-8-001:021	Leaps & Boundaries, Inc.	Edward Weldon & Katherine Weldon
MA-819	Proposed	111 Aleiki Place, Maui 96779	(2) 2-6-012:072	Action Survey LLC	111 Aleiki Place LLC
HA-644	Proposed	12-7235 Moana Kai Pali Street, Hawai'i 96778	(3) 1-2-030:012	Daniel Berg c/o dlb & Associates, LLC	Equity Trust Co. fbo Mike Stehle IRA and Lisa Stehle-Doggett
HA-645	Proposed	45-5034 Nanaina Kai Road, Hawai'i 96727	(3) 4-5-002:016 & 080	L. Edward Pare	Stephen & Cheryl Winter, Trustees

Federal Notices

As a courtesy, listed below are some relevant entries from the Federal Register published since the last issue of *The Environmental Notice*. For more information, click on the title link, also available at www.federalregister.gov.

Notice: Western Pacific Fishery Management Council; Public Meetings (published by the National Oceanic and Atmospheric Administration on 04/29/2024

The Western Pacific Fishery Management Council (Council) will hold meetings of its Archipelagic Plan Team (APT) and Pelagic Plan Team (PPT) to discuss fishery management issues and develop recommendations for future management of fisheries in the Western Pacific Region. The APT will meet on Monday and Tuesday, May 13-14, 2024, (HST). The APT will meet jointly with the PPT on Wednesday, May 15, 2024, HST. The PPT will meet on Thursday and Friday, May 16-17, 2024, HST. The meetings will be a hybrid format (web conference and in person) For specific details, times and agendas, click on the title link above.

Notice: Endangered Species; Receipt of Recovery Permit Applications (published by the Fish and Wildlife Service on 04/29/2024)

The U.S. Fish and Wildlife Service has received applications for permits to conduct activities intended to enhance the propagation and survival of various endangered bird, sea turtle and plant species in Hawaii under the Endangered Species Act. We invite the public and local, State, Tribal, and Federal agencies to comment on these applications. Before issuing the requested permits, we will take into consideration any information that we receive during the public comment period that ends on May 29, 2024. For additional information, please click on the title link above.

Proposed Rule: International Fisheries; Pacific Tuna Fisheries; Safe Handling and Release Practices for Sharks on Longline Vessels and Revision to Vessel Monitoring System Requirements in the Eastern Pacific Ocean (published by the National Oceanic and Atmospheric Administration on 04/25/2024

NMFS is proposing regulations under the Tuna Conventions Act of 1950, as amended, to implement Resolutions C-23-07 (Conservation Measures for the Protection and Sustainable Management of Sharks) and C-23-11 (On the Establishment of a Vessel Monitoring System) adopted by the Inter-American Tropical Tuna Commission (IATTC) at its meeting in August 2023 in Victoria, Canada. This proposed rule would implement provisions of these Resolutions and would require U.S. longline vessels fishing for tuna or tuna-like species in the eastern Pacific Ocean (EPO) that have incidental shark catch to release sharks by leaving them in the water and cutting the branchline so that less than 1 meter remains on each animal. The proposed rule would also require large vessels fishing for tuna or tuna-like species in the EPO to make manual reports every six hours in the event of a malfunctioning vessel monitoring system (VMS) unit. This action is necessary for the United States to satisfy its obligations as a member of the IATTC. Comments on the proposed rule and supporting documents must be submitted in writing by May 28, 2024. For additional information, please click on the title link above.

Notice: Permanent Advisory Committee To Advise the U.S. Commissioners to the Western and Central Pacific Fisheries Commission; Meeting Announcement (published by the National Oceanic and Atmospheric Administration on 04/26/2024)

NMFS announces a public meeting of the Permanent Advisory Committee (PAC) to advise the U.S. Commissioners to the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPFC) via web conference on May 13, 2024, from 10 a.m. to 1 p.m. HST. Click on the title link to this entry for supplementary information about this meeting.

Notice: Changes in Flood Hazard Determinations (published by the Federal Emergency Management Agency on 04/22/2024)

This notice lists communities (including the County of Maui) where the addition or modification of Base Flood Elevations (BFEs), base flood depths, Special Flood Hazard Area (SFHA) boundaries or zone designations, or the regulatory floodway (hereinafter referred to as flood hazard determinations), as shown on the Flood Insurance Rate Maps (FIRMs), and where applicable, in the supporting Flood Insurance Study (FIS) reports, prepared by the Federal Emergency Management Agency (FEMA) for each community, is appropriate because of new scientific or technical data. The FIRM, and where applicable, portions of the FIS report, have been revised to reflect these flood hazard determinations through issuance of a Letter of Map Revision (LOMR), in accordance with Federal Regulations. For further and supplemetary information, please click on the title link above.

Glossary of Terms and Definitions

Agency Actions
Projects or programs proposed by any department, office, board, or commission of the state or county government which is part of the executive branch of that government per HRS 343-2.

Applicant Actions
Projects or programs proposed by any person who, pursuant to statute, ordinance, or rule, requests approval for a proposed action per HRS 343-2.

Draft Environmental Assessment
When an Agency or Applicant proposes an action that triggers HRS 343, an Environmental Assessment shall be prepared at the earliest practicable time to determine whether the action's environmental impact will be significant, and thus whether an environmental impact statement shall be required per HRS 343-5(b), for Agency actions and HRS 343-5(e), for Applicant actions. For actions for which the proposing or approving agency anticipates a Finding of No Significant Impact (AFNSI), a Draft EA (DEA) shall be made available for public review and comment for 30 days and public notice is published in this periodic bulletin.

Final Environmental Assessment and Finding of No Significant Impact
The action's proponent shall respond in writing to comments on a DEA received during the 30-day review period and prepare a Final EA (FEA) that includes those responses to determine whether an environmental impact statement shall be required. If there are no significant impacts, then the Agency will issue a Finding of No Significant Impact (FONSI). An Environmental Impact Statement (EIS) will not be required and the project has cleared HRS 343 requirements. The public has 30 days from the notice of a FONSI in this bulletin to challenge the FONSI in the Environmental Court and seek a ruling to require the preparation of an EIS.

Final Environmental Assessment and Environmental Impact Statement Preparation Notice
An EIS shall be required if the Agency finds that the proposed action may have a significant effect on the environment. The Agency shall file notice of such determination with OPSD called an EIS Preparation Notice (EISPN) along with the supporting Final EA. After the notice of the FEA-EISPN is published in this bulletin, the public has 30 days to request to become a consulted party and to make written comments. The public (including the Applicant) has 60 days from the notice of the EISPN in this bulletin to ask a court to not require the preparation of an EIS.

Act 172-2012, Direct-to-EIS, Environmental Impact Statement Preparation Notice (with no EA)
Act 172 in 2012 amended HRS 343 by providing for an agency to bypass the preparation of an environmental assessment for various actions that in the experience of the agency would clearly require the preparation of an EIS. The agency must submit its determination that an EIS is required for an action (Act 172-2012, EISPN) with a completed publication form detailing the specifics of the action. This starts a 30-day scoping period in which the agency or applicant must hold a public scoping meeting for the preparation of the Draft EIS. Written comments and responses on the EISPN must be incorporated into the subsequent Draft EIS and oral comments from the public scoping meeting must be recorded and submitted to OPSD with the Draft EIS.

HEPA
While technically there is no "Hawai'i Environmental Policy Act," HRS 343 is often referred to by this term.

Act 312-2012, Secondary Actions in the Highway or Public Right Of Way
Act 312-2012, amended HRS 343, by adding a new section (HRS 343-5.5, entitled "Exception to applicability of chapter"). HEPA allows for a statutory exception for "secondary actions" (those that involve infrastructure in the highway or public right-of-way) provided that the permit or approval of the related "primary action" (those outside of the highway or public-right-of-way and on private property) is not subject to discretionary consent and further provided that the applicant for the primary action submits documentation from the appropriate agency confirming that no further discretional approvals are required. An aid to understanding this is to visualize residential driveway improvements in the public right-of-way, versus, retail outlet driveway improvements in the public right-of-way.

Draft Environmental Impact Statement
After receiving the comments on the EISPN, the Agency or Applicant must prepare a Draft Environmental Impact Statement (DEIS). The content requirements of the DEIS shall contain an explanation of the environmental consequences of the proposed action including the direct, indirect and cumulative impacts and their mitigation measures. The public has 45 days from the first publication date in this bulletin to comment on a DEIS.

Final Environmental Impact Statement
After considering all public comments filed during the DEIS stage, the Agency or Applicant must prepare a Final EIS (FEIS). The FEIS must respond in a point-by-point manner to all comments from the draft and must be included in the FEIS. For Applicant projects, the Approving Agency is the Accepting Authority and must make a determination within 30 days or the FEIS is deemed accepted as a matter of law. For an Agency project, the Governor or the Mayor (or their designated representative) is the Accepting Authority, and unlike applicant actions, there is no time limit on the accepting authority reviewing the FEIS. Only after the FEIS is accepted may the project be implemented.

Acceptability
The Accepting Authority must be satisfied that the FEIS meets three criteria (process, content, response to comments) to accept it. Whether the FEIS is accepted or not accepted, notice of the Acceptance Determination is published in this bulletin. The public has 60 days from publication to legally challenge the acceptance of a FEIS. For both Applicant and Agency actions, the Applicant or the proposing Agency can prepare a Revised DEIS after a non-acceptance determination.

Maui sunset Photo by Thomas Hawk

National Environmental Policy Act
The National Environmental Policy Act (NEPA) requires federal projects to prepare a Federal EA or EIS. In many ways it is similar to Hawai'i's law. Some projects require both a State and Federal EIS and the public comment procedure should be coordinated. Upon request by a federal agency, OPSD publishes NEPA notices in this bulletin to help keep the public informed of important federal actions.

Conservation District
Proposed uses of land in the State Conservation District require a Conservation District Use Application (CDUA). These applications are reviewed and approved/denied by the Department or Board of Land and Natural Resources. Members of the public may intervene in the permit process. This bulletin will include EAs & EISs for actions proposed within the Conservation District.

Special Management Area and Shoreline Setback Area
The Special Management Area (SMA) is along the coastline of all islands; development in this area is generally regulated by HRS 205A, and county ordinance. A portion of the SMA that is addressed by HRS 343 is the Shoreline Area, which includes land between the State-certified shoreline and the county-determined shoreline setback line. This bulletin will include EAs & EISs for actions proposed within the Shoreline Setback Area. Some projects going through the SMA permit process on O'ahu are also required to go through an environmental review process that mirrors HRS 343; these "ROH Chapter 25" EAs/EISs are included in this bulletin.

Shoreline Certifications
State law requires that Hawai'i shorelines be surveyed and certified when necessary to clearly establish the shoreline setback from the certified shoreline. The public may participate in the process to help assure accurate regulatory boundaries. Private land owners often petition to have their shoreline certified by the State surveyor prior to construction. This bulletin publishes notice from the Department of Land and Natural Resources of shoreline certification applicants and final certifications or rejections.

Environmental Advisory Council
The Environmental Advisory Council is a 15-member citizen board appointed by the Governor. They serve as a liaison between the Director of OPSD and the general public concerning ecology and environmental quality. Agendas of their regular meetings are posted on the Internet and the public is invited to attend.

Agency Exemption Lists
Government agencies may keep a list describing the minor activities they regularly perform that are exempt from the environmental review process. These lists and any amendments shall be submitted to the Council for review and concurrence (HAR 11-200.1-16). This bulletin will publish an agency's draft exemption list for public comment prior to Council decision making, as well as notice of the Council's decision on the list.

Endangered Species
This bulletin is required by HRS 343-3(c), to publish notice of public comment periods or public hearings for Habitat Conservation Plans (HCP), Safe Harbor Agreements (SHA), or Incidental Take Licenses (ITL) under the federal Endangered Species Act, as well as availability for public inspection of a proposed HCP or SHA, or a proposed ITL (as a part of an HCP or SHA).

Navy Region Hawaii
May 8 at 6:03 PM ·

The Navy and NASA invite you to participate. The Navy and NASA are jointly preparing an Environmental Impact Statement (EIS) for proposed continued use of State of Hawai'i lands for the Navy's Pacific Missile Range Facility (PMRF) and NASA's Kōke'e Park Geophysical Observatory (KPGO), through potential updated real estate agreements. The Navy and NASA are initiating a public scoping period to receive comments on the scope of the EIS. The scoping meetings will also serve as an opportunity to receive public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawai'i Revised Statutes Section 6E-42. Attend any of the public scoping meetings on Kaua'i listed below to talk story, learn more, and submit written or oral comments. Submit comments by June 17, 2024. Your voice is important to this planning process.

Meeting Times: 5 to 8 p.m., with Navy and NASA presentation from 6 to 6:30 p.m.:

Tuesday, June 4, 2024
Kaua'i Veterans Center
3215 Kaua'i Veterans Memorial Hwy, Līhu'e

Wednesday, June 5, 2024
Kekaha Neighborhood Center
8130 Elepaio Rd, Kekaha

Thursday, June 6, 2024
Sheraton Kaua'i Coconut Beach Resort
650 Aleka Loop, Kapa'a

In addition to the scoping meetings, the public may submit comments in any of the following ways:
• In person at a public scoping meeting
• Through the project website at PMRF-KPGO-EIS.com
• By email to info@PMRF-KPGO-EIS.com
• By mail, postmarked by June 17, 2024, to the following address:
Naval Facilities Engineering Systems Command, Hawai'i
Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

Visit PMRF-KPGO-EIS.com to learn more.

4 3 comments 1 share

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Post

Navy Region Hawaii
@NavRegHawaii

Follow

Navy & NASA invite you to participate in the Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement. Attend public meetings June 4-6, and submit comments by June 17, 2024. Visit PMRF-KPGO-EIS.com to learn more.

From pmrf-kpgo-eis.com

12:07 PM · 5/8/24 From Earth · **91** Views

Post your reply

Pacific Missile Range Facility
May 8 at 11:00 AM ·

The Navy and NASA invite you to participate.

The Navy and NASA are jointly preparing an Environmental Impact Statement (EIS) for proposed continued use of State of Hawai'i lands for the Navy's Pacific Missile Range Facility (PMRF) and NASA's Kōke'e Park Geophysical Observatory (KPGO), through potential updated real estate agreements. The Navy and NASA are initiating a public scoping period to receive comments on the scope of the EIS. The scoping meetings will also serve as an opportunity to receive public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawai'i Revised Statutes Section 6E-42. Attend any of the public scoping meetings on Kaua'i listed below to talk story, learn more, and submit written or oral comments. Submit comments by June 17, 2024. Your voice is important to this planning process.

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Pearl Harbor, HI 96860

Visit https://pmrf-kpgo-eis.com/ to learn more.

PMRF-KPGO-EIS.COM
PMRF & KPGO EIS
Welcome to the project website for the Pacific Missile Range Facility and Kōke'e Park Geophysi...

7 5 shares

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MEDIA RELEASE: THE U.S. NAVY AND NASA JOINTLY PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR CONTINUED USE OF STATE LANDS THROUGH PROPOSED REAL ESTATE AGREEMENTS WITH THE STATE OF HAWAI‘ I

08 May 2024

FROM COMMANDER, NAVY REGION HAWAII PUBLIC AFFAIRS

The U.S. Department of the Navy and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) and welcome the community's input in the environmental planning process. The public's participation in this initial phase of the environmental planning process is important to ensuring community concerns are identified and addressed in the environmental analysis.

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Welcome to the project website for the Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Aloha and Welcome

The U.S. Navy and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO). The Navy and NASA invite the public to participate in the environmental planning process.

This project website provides the latest information on the EIS. Please review this site for:

- information on the status and schedule of the EIS
- documents and references available for review
- opportunities for public involvement
- methods to submit comments during the designated public comment periods

This website will be updated throughout the project. Please check back often for updates.

Public Scoping Period

Privacy - Terms

Public involvement is an integral part of the environmental planning process. The public has an important role in providing input during this process to help the Navy and NASA make more informed decisions about the proposed real estate action.

The Navy and NASA are initiating a public scoping period to receive comments on the scope of the EIS. The public can participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS.

The public scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawaiʻi Revised Statutes Section 6E-42.

To submit a public comment, please click here to access the Comment Form **(https://pmrf-kpgo-eis.com/comment-form/)** .

To add your name to the mailing list to receive notifications about the project, please click here to access the Mailing List Form **(https://pmrf-kpgo-eis.com/mailing-list/)** .

How to Submit Scoping Comments

The Navy and NASA welcome your scoping comments. Comments should be related to the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS.

The public may submit comments in any of the following ways:

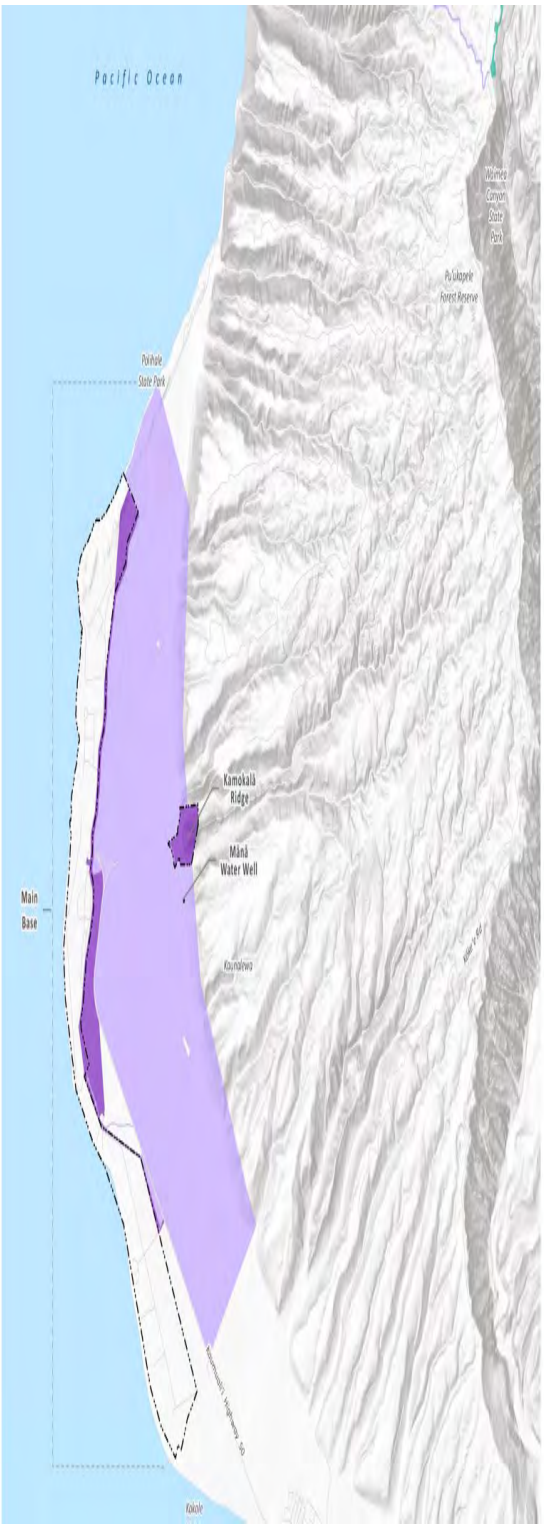
- In person at a public scoping meeting, where comments will be accepted orally and in writing
- In writing via the online Comment Form **(https://pmrf-kpgo-eis.com/comment-form/)**
- In writing via email to info@PMRF-KPGO-EIS.com **(mailto:info@pmrf-kpgo-eis.com)**
- In writing via postal mail, postmarked by June 17, 2024 to the following address:
  Naval Facilities Engineering Systems Command, Hawaiʻi
  Environmental OPHEV2
  Attn: PMRF and KPGO RE EIS Project Manager,
  Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

Public Scoping Meetings

The Navy and NASA will host public scoping meetings at three locations on Kauaʻi. The public is encouraged to attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments.

Tuesday, June 4, 2024 Kauaʻi Veterans Center	**Meeting Times: 5 to 8 p.m.** **Agenda:**

3215 Kaua‘i Veterans Memorial Hwy, Līhu‘e **Wednesday, June 5, 2024** Kekaha Neighborhood Center 8130 Elepaio Rd, Kekaha **Thursday, June 6, 2024** Sheraton Kaua‘i Coconut Beach Resort 650 Aleka Loop, Kapa‘a	• **5 to 8 p.m.** Information stations – meet the projec team, talk story, and ask questions. Visit the comments station to provide a written or oral comment. • **6 to 6:30 p.m.** Project presentation by Navy and NASA.



Proposed Action

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawai‘i lands on Kaua‘i for operational continuity and sustainment of the military readiness mission. NASA proposes to maintain long-term use of 23 acres of State of Hawai‘i land on Kaua‘i for continued operations of Kōke‘e Park Geophysical Observatory.

Click here to learn more.
(/environmental-planning/proposed-action/)

Get Involved

The Navy and NASA are initiating a public scoping period to receive public comments on topics to be considered in the development of the Environmental Impact Statement. Attend any of the upcoming public scoping meetings to talk story, learn more, and submit written or oral comments.

The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawaiʻi Revised Statutes Section 6E-42.

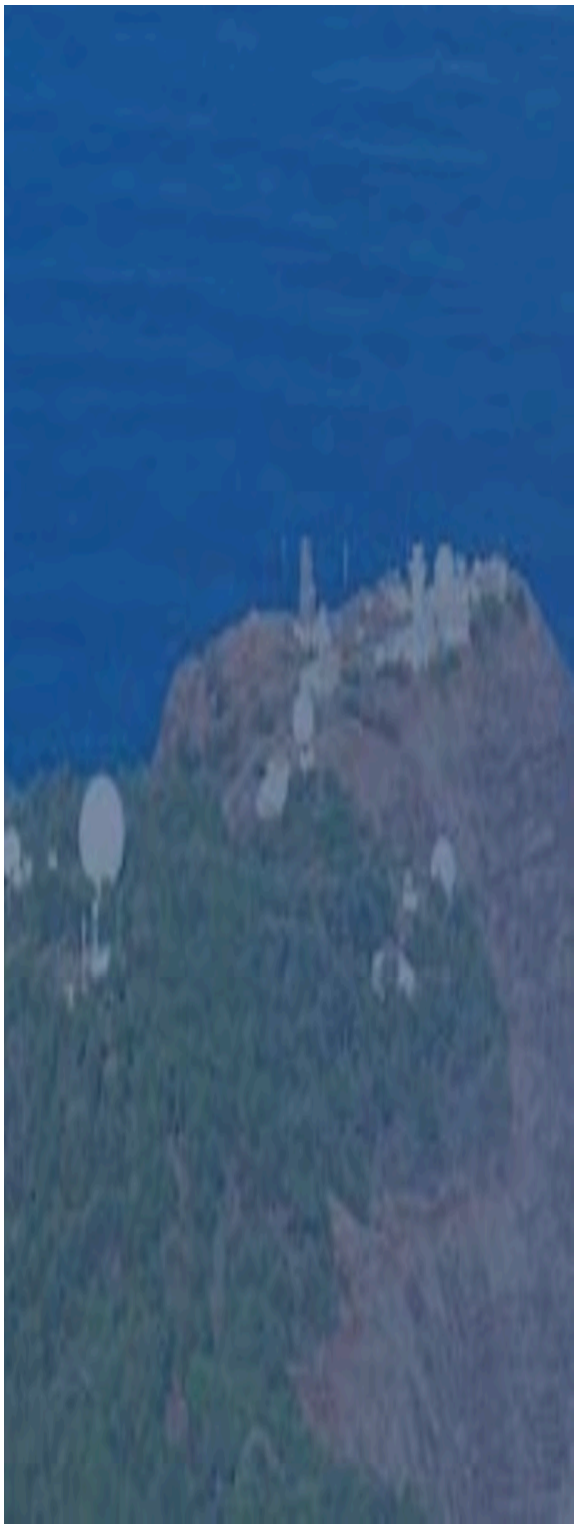
Click here to learn more.
(/public-involvement/)

Environmental Planning Process

The Navy and NASA are preparing an Environmental Impact Statement in accordance with the requirements of the National Environmental Policy Act (NEPA) and Hawaiʻi Revised Statutes (HRS) Chapter 343 and Hawaiʻi Administrative Rules (HAR) Chapter 11-200.1, collectively referred to as the Hawaiʻi Environmental Policy Act (HEPA).

Click here to learn more.

(/environmental-planning/environmental-review-process/)



FAQs

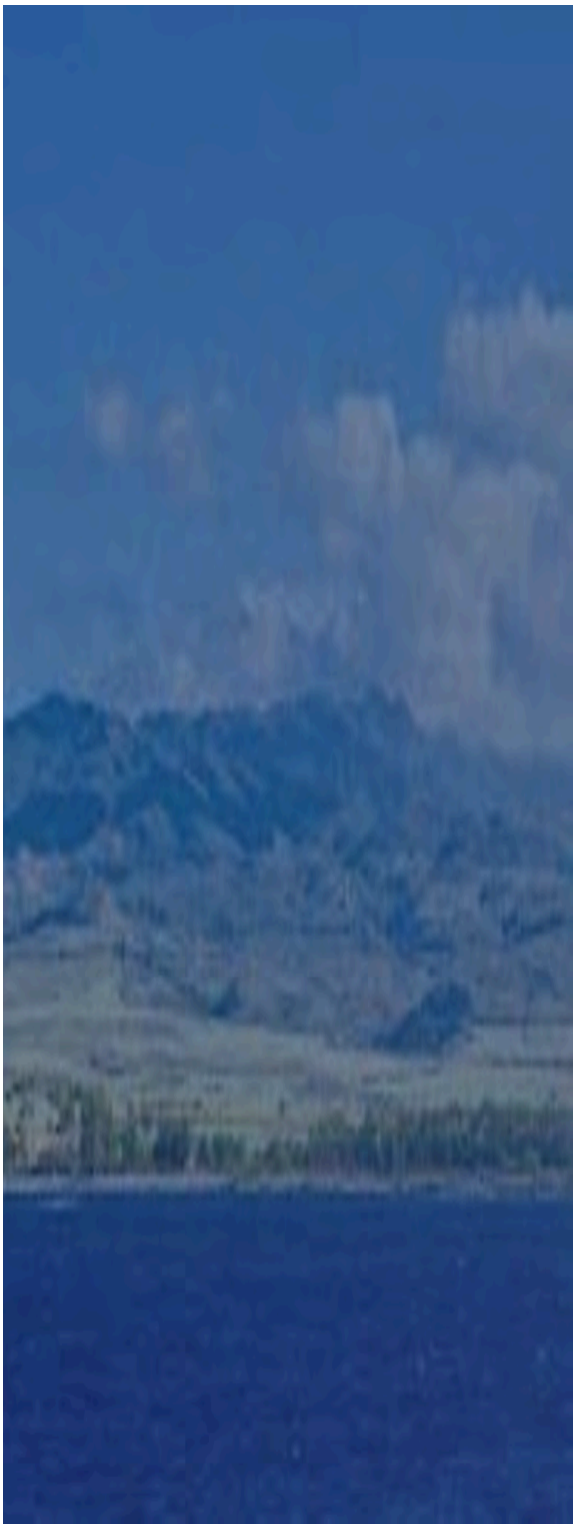
Click here for responses to common questions.

(/faqs/)

Documents

Find documents and informational materials related to the project.

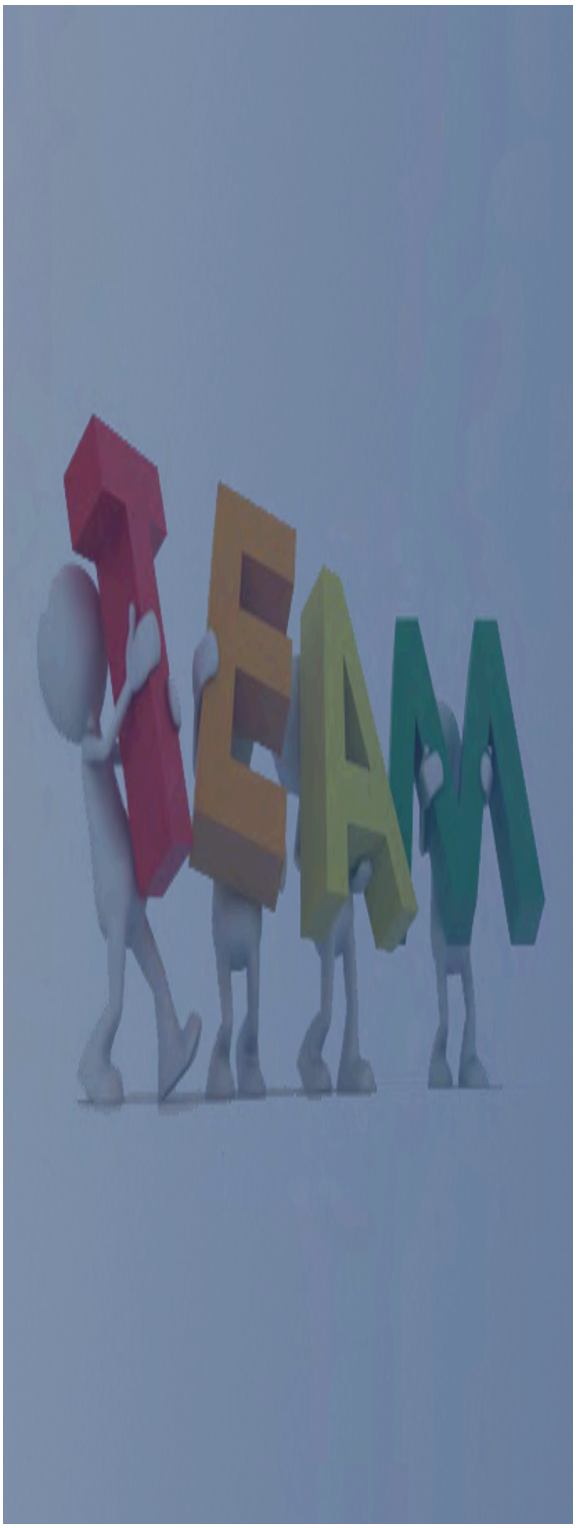
(/documents/)



Contact Us

Have a question? Click here to contact the project team.

(/contact-us/)



Project Team

Click Here

(/members-area/)

Please revisit this website as the content will be updated frequently.

This website is compliant with Section 508 of the Rehabilitation Act. This allows assistive technology to be used to obtain the available information from the website. Due to the nature of graphics, figures, tables, and images occurring in the website, accessibility is limited to a descriptive title for each item.

© 2024 Privacy Policy (/privacy-policy/) Section 508 (https://www.compliance.af.mil/Resources/Section-508-Compliance/)

Attachment I

E Pane Maí Ka Nonoí O Nohíli

Answering the requests of Nohili

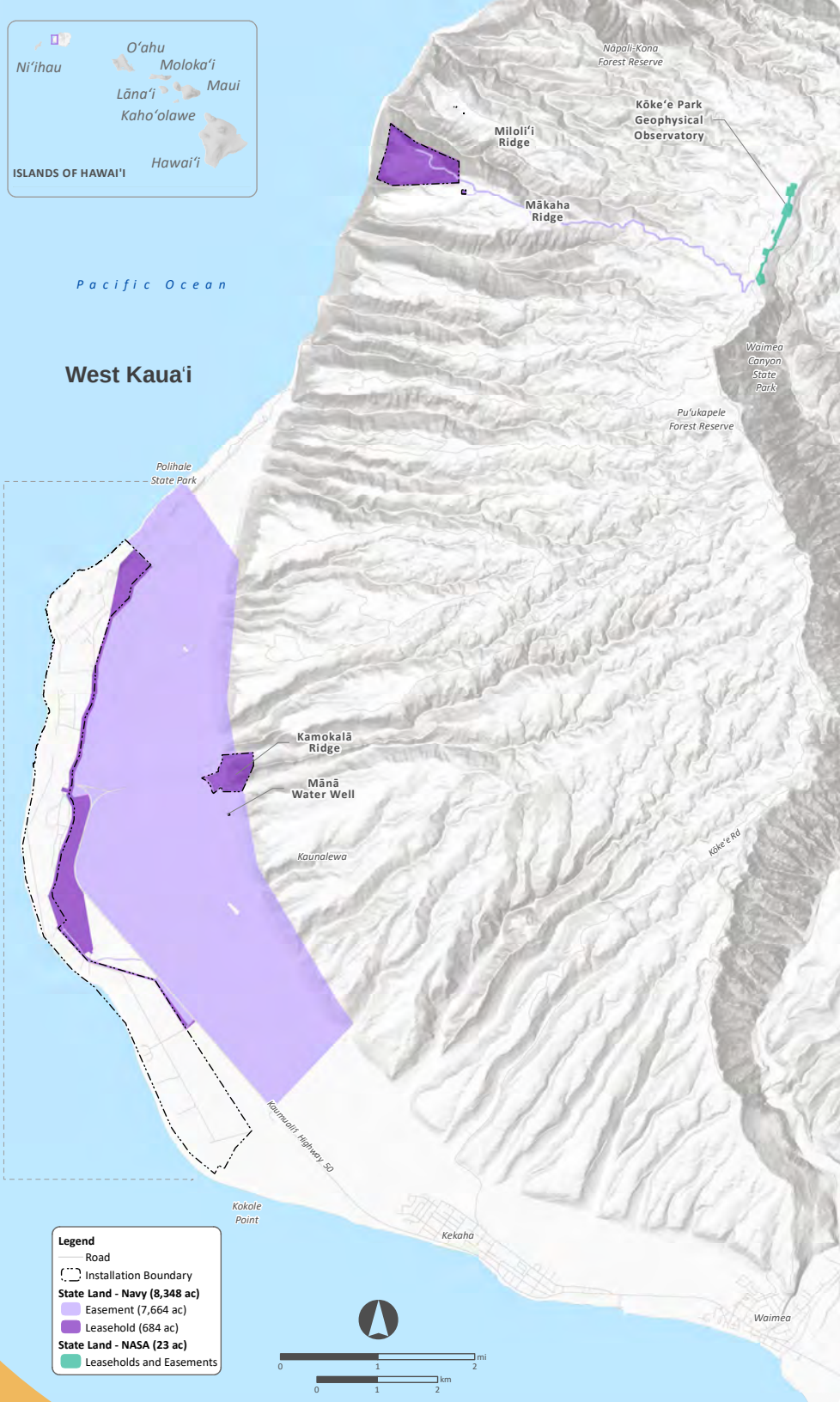
U.S. NAVY PACIFIC MISSILE RANGE FACILITY AND NASA

KŌKEʻE PARK GEOPHYSICAL OBSERVATORY REAL ESTATE ENVIRONMENTAL IMPACT STATEMENT

The Navy and NASA invite you to participate in the environmental planning process and submit comments.

The U.S. Department of the Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawaiʻi for the Pacific Missile Range Facility (PMRF) and the Kōkeʻe Park Geophysical Observatory (KPGO). The Navy and NASA are initiating a public scoping period to receive comments on the scope of the EIS. The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawaiʻi Revised Statutes Section 6E-42.

The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State of Hawaiʻi lands on Kauaʻi for operational continuity and sustainment of the military readiness mission. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. NASA proposes to maintain long-term use of 23 acres of State of Hawaiʻi land on Kauaʻi for continued operations of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.



The Navy and NASA will host public scoping meetings at three locations on Kaua‘i. Attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments. Your voice is important to this planning process.

Meetings will be held from 5 to 8 p.m. HST at the following locations:

Public Scoping Meetings:

Tuesday, June 4, 2024
Kaua‘i Veterans Center
3215 Kaua‘i Veterans Memorial Hwy, Līhu‘e

Wednesday, June 5, 2024
Kekaha Neighborhood Center
8130 Elepaio Rd., Kekaha

Thursday, June 6, 2024
Sheraton Kaua‘i Coconut Beach Resort
650 Aleka Loop, Kapa‘a

Agenda:

5 to 8 p.m.
Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.

6 to 6:30 p.m.
Project presentation by Navy and NASA.

For language assistance or special accommodations, contact the PMRF Public Affairs Officer at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.
Requests for language assistance or special accommodations should be made at least seven days prior to the public meeting.

For more information, visit PMRF-KPGO-EIS.com

Submit Comments in Person, Online, or by Mail

Submit comments by *June 17, 2024*.
The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at PMRF-KPGO-EIS.com
- By email to info@PMRF-KPGO-EIS.com
- By mail, postmarked by *June 17, 2024* to the following address:

  Naval Facilities Engineering Systems Command, Hawai‘i
  Environmental OPHEV2
  Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

The Navy and NASA propose to evaluate potential environmental impacts to the following resource areas. The public is invited to provide input on these and other resources that should be considered in the EIS.

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

Biological Environment

- Biological resources

Preserving the long-term Department of Defense and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global and local significance.

It also ensures the continued conservation management by the Navy and NASA of natural and cultural resources on these lands.

May 2024

Attachment J

Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Welcome to the project website for the Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Aloha and Welcome

The U.S. Navy and the National Aeronautics and Space Administration (NASA) are jointly

Public Scoping Meetings

Proposed Action and Preliminary Alternatives

Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

Proposed Action

The Navy proposes to maintain long-term Department of Defense use of the 8,348 acres of State of Hawai'i lands on Kaua'i for operational continuity and sustainment of the military readiness mission. NASA proposes to maintain long-term use of the 23 acres of leaseholds and easements on Kaua'i for continued operation of Kōke'e Park Geophysical Observatory (KPGO). The Navy and NASA existing real estate agreements for State lands were established in 1964 and 1965 and are set to expire between 2027 and 2030.

Alternative 1: Succeeding Current Real Estate Agreements.

Under this alternative, the Navy and NASA would apply to the Department of Land and Natural Resources for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements. The Navy's agreements would include 684 acres of land leased exclusively by the Navy and 7,664 acres of easements. NASA's agreements would include 16 acres of land leased exclusively by NASA, 7 acres of easement lands, and would continue its Use Permit with the Navy. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds.

Under this alternative, the Navy and NASA would pursue fee simple acquisition of 700 acres (684 acres for Navy use and 16 acres for NASA use) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1. The new Navy fee simple land of 684 acres would include 392 acres of land at the Main Base, 89 acres at Kamokalā Ridge, 0.29 acre at the Mānā Water Well, 0.015 acre at Miloli'i Ridge, 203 acres at Mākaha Ridge, and the NASA fee simple land would include 16 acres at KPGO. This acreage would be transferred from ownership by the State of Hawai'i to the United States. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 3: No Action Alternative.

Conservation & Community

Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

The Navy at PMRF takes great pride in its role as caretakers of the cultural and natural resources entrusted to it.

The Navy believes it is the responsibility of all personnel, all commands, and all contractors to help protect Hawai'i's environment. The Navy strives to comply with environmental requirements and protect and preserve natural and cultural resources with which it is entrusted.

Over its 65-year history at PMRF, the Navy has established many successful stewardship programs. Conservation management of natural and cultural resources is a priority for both stewardship and mission readiness. This includes activities such as protecting the endangered Hawaiian monk seal (*Neomonachus schauinslandi*), green sea turtle (*Chelonia mydas*), protected birds to include the Nene Hawaiian goose, wetlands, precontact archaeological sites, iwi kūpuna (ancestral remains), and historic buildings and structures. The Navy also protects natural and cultural resources, including native Hawaiian sacred resources.

PMRF's awareness of the importance of Native Hawaiian cultural values is embodied in PMRF's slogan: ***E Pane Mai Ka Nonoi O Nohili – Answering the Requests of Nohili.***

The table below (Table 1) lists Navy funded and managed natural and cultural programs on State lands.

Table 1 Navy Programs on State Lands

Program	*Description*
	Mitigation for the effects of sea level rise on agricultural land on the Mānā Plain by: • creating an open floodable space to reduce the quantity and improve the quality of stormwater runoff discharged from agricultural drainage ditches into the nearshore

Public Involvement

Pacific Missile Range Facility and Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

The Navy and NASA value and welcome input from the community, as well as the chance to share, communicate, and inform the community about the Environmental Impact Statement and the need for the real estate agreements.

Public Scoping Meetings

The Navy and NASA hosted public scoping meetings at three locations on Kaua'i. The public was encouraged to attend any of the public scoping meetings to talk story, learn more, and submit written or oral comments. The public scoping meetings were held on the dates below.

Tuesday, June 4, 2024 Kaua'i Veterans Center 3215 Kaua'i Veterans Memorial Hwy, Līhu'e **Wednesday, June 5, 2024** Kekaha Neighborhood Center 8130 Elepaio Rd, Kekaha **Thursday, June 6, 2024** Sheraton Kaua'i Coconut Beach Resort 650 Aleka Loop, Kapa'a	**Meeting Times: 5 to 8 p.m.** **Agenda:** • **5 to 8 p.m.** Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment. • **6 to 6:30 p.m.** Project presentation by Navy and NASA.

Attachment K

U.S. Navy Pacific Missile Range Facility and NASA Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

Public Scoping Fact Sheet

Public Scoping Meeting Schedule

Attend any of the three public scoping meetings to talk story, learn more, and submit comments. Your voice is important to this planning process.

DATE	LOCATION	AGENDA
Tuesday, June 4, 2024	Kaua`i Veterans Center 3215 Kaua`i Veterans Memorial Hwy, Līhu`e	• 5 to 8 p.m. Information stations – meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment. • 6 to 6:30 p.m. Project presentation by Navy and NASA.
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Thursday, June 6, 2024	Sheraton Kaua`i Coconut Beach Resort 650 Aleka Loop, Kapa`a	**MEETING TIME:** 5 to 8 p.m. HST

Please Check In!

Scoping is the public’s opportunity to provide comments to help the Navy and NASA focus their analysis. Please visit the project website at PMRF-KPGO-EIS.com

Welcome

The U.S. Navy (Navy) and the National Aeronautics and Space Administration (NASA) are jointly preparing an Environmental Impact Statement (EIS) to evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawai`i for the Pacific Missile Range Facility (PMRF) and the Kōke`e Park Geophysical Observatory (KPGO). The Navy and NASA invite you to participate in this environmental planning process.

What are the Navy and NASA Proposing?

The Navy currently leases or holds easements for approximately 8,348 acres of State of Hawai`i land primarily for passive encroachment buffer as well as for mission readiness, access, and utilities for PMRF on Kaua`i. The Navy proposes to maintain long-term Department of Defense use of the 8,348 acres of State of Hawai`i lands on Kaua`i for operational continuity and sustainment of the military readiness mission.

The Navy operates on 410 acres of the total acres leased from the State of Hawai`i. The remaining acres are used as buffer zones, conservation areas, infrastructure, and access corridors.

NASA currently leases or holds easements for 23 acres of State of Hawai`i land for operations of KPGO. NASA has issued a Use Permit to the Navy for use of portions of KPGO to conduct PMRF mission support with radar, telemetry, and communications services.

NASA operates KPGO to collect geodetic data about the Earth's shape, orientation in space, and gravity. This data supports modern navigation technology such as the Global Positioning System (GPS) that is used every day in a wide variety of devices, from handheld smartphones to satellites. In addition, this data is used for scientific studies, spacecraft navigation, and the geolocation of Earth observations.

NASA proposes to maintain long-term use of the 23 acres of leased lands and easements for continued operation of KPGO. The Proposed Action is needed because existing real estate agreements for these State lands are set to expire between 2027 and 2030.

On Kaua`i, the Navy is the largest high-tech employer and third largest overall employer. Most of the 900 personnel at PMRF are civilians, including many from the local community. PMRF contributes approximately $150 million annually in salary, contract goods, and services to the local economy.

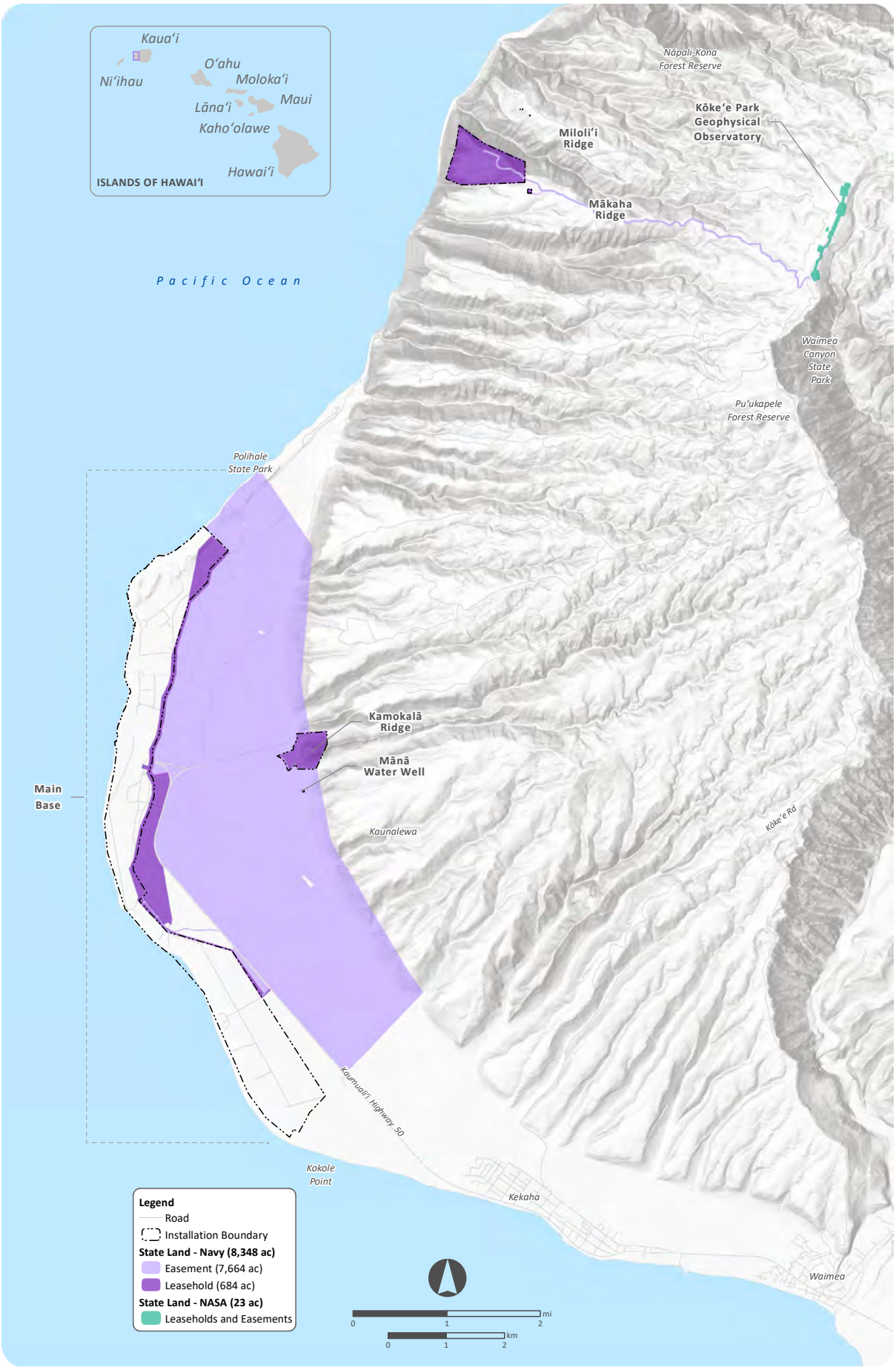


Figure 1. Project Map

Action Alternatives

Alternative 1: Succeeding Current Real Estate Agreements.

Under this alternative, the Navy and NASA would apply to the Department of Land and Natural Resources for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements. The Navy's agreements would include 684 acres of land leased exclusively by the Navy and 7,664 acres of easements. NASA's agreements would include 16 acres of land leased exclusively by NASA, 7 acres of easement lands, and would continue its Use Permit with the Navy. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds.

Under this alternative, the Navy and NASA would pursue fee simple acquisition of 700 acres (684 acres for Navy use and 16 acres for NASA use) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1. The new Navy fee simple land of 684 acres would include 392 acres of land at the Main Base, 89 acres at Kamokalā Ridge, 0.29 acre at the Mānā Water Well, 0.015 acre at Miloli‘i Ridge, 203 acres at Mākaha Ridge, and the NASA fee simple land would include 16 acres at KPGO. This acreage would be transferred from ownership by the State of Hawai‘i to the United States. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 3: No Action Alternative.

Under the No Action Alternative, the Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place, from Navy and NASA leased and easement lands.

Preliminary Environmental Resources to be Studied

The Navy and NASA propose to evaluate potential environmental impacts for each of the alternatives on the following resource areas. The public is invited to provide input on these and other resources that should be considered in the EIS.

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Biological Environment

- Biological resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

PMRF honors ancestral Native Hawaiians in summer solstice event.

Sea turtle on beach at PMRF.

Nohili Dunes.

Waiokapua Bay, at PMRF.

Hawai'i's state bird, the nēnē, or Hawaiian goose.

Solar panels at PMRF.

About the Navy Pacific Missile Range Facility and NASA Kōke`e Park Geophysical Observatory

Pacific Missile Range Facility

PMRF is the world's largest instrumented multi-domain training and testing facility. What makes PMRF unique is its ability to simultaneously support surface, subsurface, air, and space operations. For portions of PMRF, the Navy has lease agreements with the State of Hawai`i for 8,348 acres, comprised of 684 acres of leaseholds and 7,664 acres of easements. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. For more information, visit https://cnrh.cnic.navy.mil/Installations/PMRF-Barking-Sands/

PMRF engages and actively participates with the community. Personnel who work at PMRF take great pride in their role as caretakers of the cultural and natural resources they are entrusted with. As the third largest employer on Kaua`i, many of the personnel are from the community.

Kōke`e Park Geophysical Observatory

NASA's Kōke`e Park Geophysical Observatory (KPGO) is located on a remote ridge within Kōke`e State Park. NASA operates the observatory to collect geodetic data that contributes to daily measurements of the Earth's orientation in space and rotation. This data is used for scientific studies and a wide variety of positioning and navigation applications. For more information, visit https://space-geodesy.nasa.gov/NSGN/sites/KPGO/KPGO.html

Preserving the long-term Department of Defense and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global and local significance. It also ensures the continued conservation management by the Navy and NASA of natural and cultural resources on these lands.

PMRF and KPGO Timeline

- **1964 - 2007** — Navy and NASA enter into real estate agreements with the State of Hawai'i
- **1988** — Navy establishes Natural Resources Management Plan for PMRF
- **1998** — Navy establishes Integrated Cultural Resources Management Plan for PMRF
- **2014** — Navy establishes Readiness and Environmental Protection Integration Program projects for PMRF
- **2019** — Lua Kupapa'u O Nohili (crypt) is constructed
- **2027 - 2030** — Current real estate agreements expire

What is the Space Geodesy Project at KPGO?

The Space Geodesy Project (SGP) maintains a global network of space geodetic observing instruments. The network is comprised of sites around the world that use four primary observation techniques:

- Very Long Baseline Interferometry (VLBI)
- Satellite Laser Ranging
- Doppler Orbitography by Radiopositioning Integrated on Satellite (DORIS)
- Global Navigation Satellite System (GNSS)

The International Terrestrial Reference Frame (ITRF) is determined by the observations made from the instruments listed above and is the foundation for virtually all Earth observations and georeferenced data used by society. This data is fundamental for:

- Positioning and navigation in space/air and on land/sea
- Tracking sea level changes
- Tsunami early warning systems
- Volcano deformation measurements
- Predicting flood patterns
- Studying glacier dynamics

What is KPGO?

The Kōke`e Park Geophysical Observatory (KPGO) is one of the core sites for NASA's SGP. The mission of KPGO is to collect geodetic data to support the geolocation of Earth observation from both land and space as well as scientific investigations of the Earth's surface and interior.

Why is KPGO Important?

NASA and the scientific community use the data collected by KPGO to study ecosystems, water cycles, geological hazards, sea-level change, crustal-dynamics, and many other Earth science topics. Many of these applications rely on the long history and continuity of the geodetic data collected from the current KPGO location.

Why Kōke`e State Park?

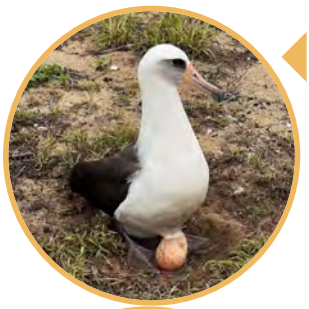
KPGO is in Kōke`e State Park at an elevation of 3,600 feet near the Waimea Canyon, isolated from radio broadcasts that would interfere with the sensitive measurements made by the VLBI system. The location on the island of Kaua`i is also critical for tying the Hawaiian Islands into the ITRF that contributes towards improving positioning and navigation accuracy on and around Hawai`i.

Stewardship and Care of the Land

Personnel who work at PMRF take great pride in their role as caretakers of the cultural and natural resources they are entrusted with.

E Pane Mai Ka Nonoi O Nohili
Answering the requests of Nohili

NATURAL RESOURCES CONSERVATION THROUGH PARTNERSHIPS



Conservation of Laysan albatross through translocation program.

Conservation of green sea turtles and their nests.

Conservation of sensitive species at Honopū Valley.

CULTURAL RESOURCES PRESERVATION

The Lua Kupapa'u O Nohili (crypt) preserves and honors iwi kūpuna (ancestral remains) found on PMRF.

Mānā Town Japanese cemetery from the sugar plantation days.

COMMUNITY SERVICE

Local scientists and students take part in natural resource surveys.

PMRF celebrates with the community at Kekaha Family Fun Day.

PMRF hosts the community at Earth Day events.

CLEAN ENERGY AND RESILIENCY THROUGH RENEWABLE ENERGY PROJECTS

Solar facility and battery energy storage system at PMRF.

In 2023, the Department of Defense Readiness and Environmental Protection Integration (REPI) program awarded $5.29 million to natural resource conservation projects on Kaua`i. Approximately $26.7 million was awarded for all of Hawai`i.

NEPA/HEPA/Historic Preservation Process and Community Involvement

The Navy and NASA are jointly preparing the EIS pursuant to the National Environmental Policy Act (NEPA). The EIS will also be used by the Hawai`i Department of Land and Natural Resources under Hawai`i Revised Statutes (HRS) Chapter 343 and Hawai`i Administrative Rules Chapter 11-200.1, collectively referred to as the Hawai`i Environmental Policy Act (HEPA), in its decision making as to whether and what type of real estate agreement it may grant the Navy and NASA.

The EIS Process diagram (at right) illustrates the stages of public involvement in the NEPA and HEPA environmental processes. The public involvement processes for NEPA and HEPA for this EIS are running concurrently to meet the requirements for both state and federal laws and regulations.

The NEPA/HEPA scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and HRS Section 6E-42.

Community Involvement

The Navy and NASA are initiating a public scoping process to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS, and the project's potential to affect historic properties pursuant to Section 106 of the NHPA and HRS Section 6E-42.

The Navy and NASA are proud contributing members of the local community. The Navy and NASA value and welcome input from the community, as well as the chance to share, communicate, and inform the community about the EIS and the need for the real estate agreements.

Opportunities for formal public participation in the EIS process occur during two stages:

1. During the scoping period, following publication of the Notice of Intent (NOI) and the Environmental Impact Statement Preparation Notice (EISPN).
2. During the comment period following publication of the Draft EIS.

What is Scoping?

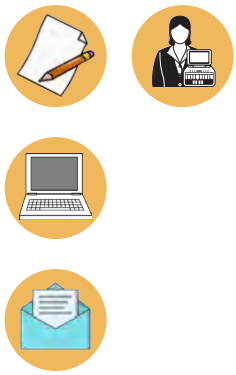
Scoping occurs at the beginning of the NEPA/HEPA process to help the Navy and NASA understand community-specific concerns regarding the Proposed Action and the planned analysis. Scoping encourages the participation of other federal, state, and local agencies, Native Hawaiian Organizations, environmental, cultural, and other groups, and the general public. Scoping helps determine what should be studied in this EIS including the alternatives and resources to be analyzed.

How to Submit Comments

Submit Comments in Person, Online, or by Mail.

Submit comments by ***June 17, 2024***. The Navy and NASA encourage the public to attend a public scoping meeting and to visit the project website to learn more.

The public may submit comments in any of the following ways:



- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, **postmarked by *June 17, 2024*** to the following address:

  Naval Facilities Engineering Systems Command, Hawai`i
  Environmental OPHEV2
  Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.

Notes:

We appreciate your time and interest.

For more information visit the project website at PMRF-KPGO-EIS.com

Attachment L

E Pane Mai Ka Nonoi O Nohili

Answering the requests of Nohili

U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

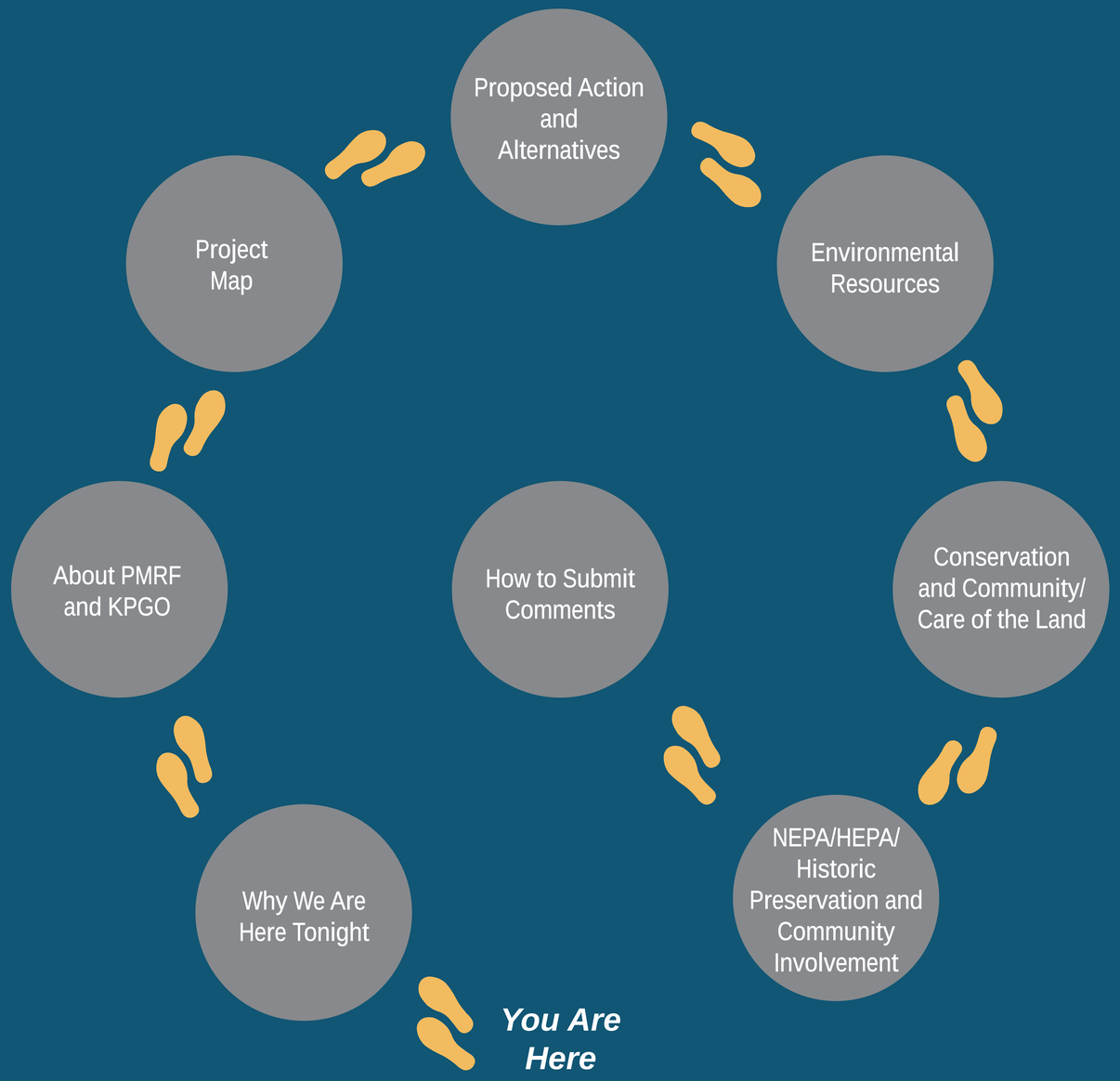
Aloha and Welcome

Your participation is important to this planning process

PMRF-KPGO-EIS.com

Why We Are Here Tonight

- The Navy and NASA will evaluate the potential environmental impacts of proposed real estate agreements with the State of Hawai‘i, Department of Land and Natural Resources for the Pacific Missile Range Facility and Kōke‘e Park Geophysical Observatory.
- The scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act and Hawai‘i Revised Statutes Section 6E-42.
- This is the beginning of the environmental planning process.
- The Navy and NASA invite you to participate and to provide your comments.
- Your comments can help the Navy and NASA evaluate potential environmental impacts.



About the Navy Pacific Missile Range Facility (PMRF)

PMRF is the world's largest instrumented multi-domain training and testing facility. What makes PMRF unique is its ability to simultaneously support surface, subsurface, air, and space operations.

Personnel at PMRF engage and actively participate with the community.

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- **2027 - 2030** — Current real estate agreements expire

About the Kōke‘e Park Geophysical Observatory (KPGO)

The Kōke‘e Park Geophysical Observatory (KPGO) is located on a remote ridge within Kōke‘e State Park in the western portion of Kaua‘i.

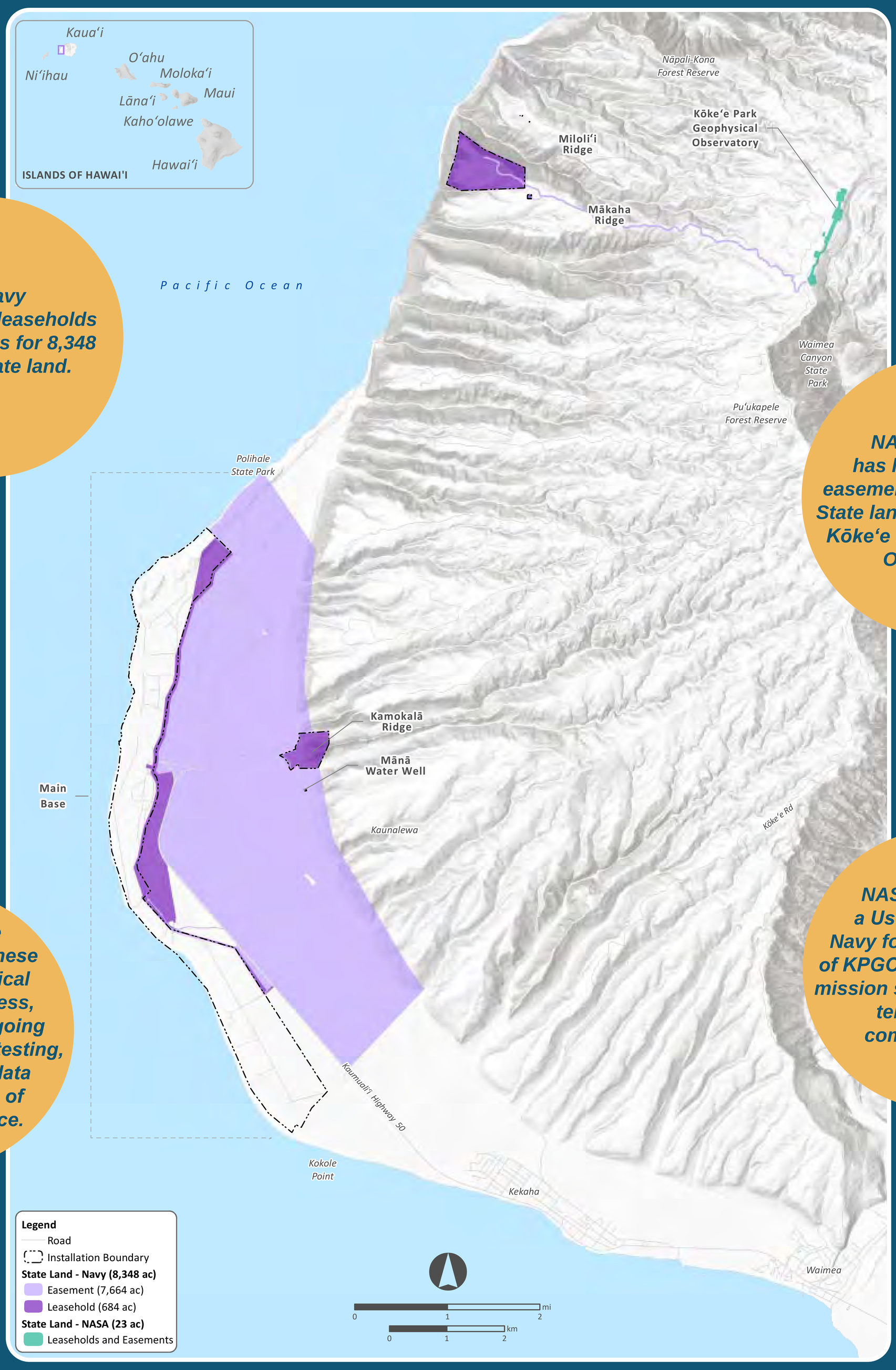
NASA operates KPGO to collect geodetic data about the Earth’s shape, orientation in space, and gravity. This data supports modern navigation technology such as the Global Positioning System (GPS) that is used every day in a wide variety of devices, from handheld smartphones to satellites. This data is also used for scientific studies, spacecraft navigation, and the geolocation of Earth observations.

Continued operations at KPGO would ensure that data-related operations of global and local significance can continue, allowing multiple agencies’ missions to persist without interruption.

NASA has issued a Use Permit to the Navy for use of portions of KPGO to conduct PMRF mission support with radar, telemetry, and communications services.

NASA’s lease began in 1965 when KPGO was part of the NASA Manned Space Flight Network. Since that time, KPGO has supported many NASA and external projects and has hosted a variety of equipment; it is a highly flexible and crucial geodetic site.

NASA’s Space Geodesy Project maintains a global network of space geodetic observing instruments. The network is comprised of sites around the world that use four primary observation techniques.



The Navy currently has leaseholds and easements for 8,348 acres of State land.

NASA currently has leaseholds and easements for 23 acres of State land for operations at Kōke'e Park Geophysical Observatory.

Preserving the long-term use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global significance.

NASA has issued a Use Permit to the Navy for use of portions of KPGO to conduct PMRF mission support with radar, telemetry, and communications services.

Current Land Agreements – West Kaua'i

PROPOSED ACTION

- The Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State lands on Kaua‘i for operational continuity and sustainment of the military readiness mission.
- The 8,348 acres is comprised of:
  - 684 acres of leaseholds
  - 7,664 acres of easements
- NASA proposes to maintain long-term use of 23 acres of leased lands and easements on Kaua‘i for continued operation of Kōke‘e Park Geophysical Observatory (KPGO).

The Navy and NASA existing real estate agreements for State lands were established in 1964 and 1965 and are expiring between 2027 and 2030.

The Navy operates on 410 acres of the total acres leased from the State of Hawai‘i. The remaining acres are used as buffer zones, conservation areas, infrastructure, and access corridors.

ALTERNATIVES

- **Alternative 1: Succeeding Current Real Estate Agreements.** The Navy and NASA would apply to the State of Hawai‘i Department of Land and Natural Resources for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements.
- **Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds.** The Navy and NASA would pursue fee simple acquisition of 700 acres (684—Navy, 16—NASA) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1.
- **Alternative 3: No Action Alternative.** The Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030.

The Navy and NASA propose to evaluate the potential environmental impacts of each of these alternatives in the Environmental Impact Statement.

ENVIRONMENTAL RESOURCES

The Navy and NASA propose to evaluate potential environmental impacts for each of the alternatives on the following resource areas. The public is invited to provide input on these and other resources that should be considered in the Environmental Impact Statement.

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Biological Environment

- Biological resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

Waiokapua Bay, at PMRF

Sea turtle on beach at PMRF

Laysan albatross at PMRF

PMRF hosts Hālau Hula at Nohili Dunes

Nohili Dunes

Hawai'i's state bird, the nēnē, or Hawaiian goose

Sea turtle hatchling

CONSERVATION AND COMMUNITY

Stewardship and Care of the Land

Personnel who work at the Pacific Missile Range Facility (PMRF) take great pride in their role as caretakers of the cultural and natural resources they are entrusted with.

CULTURAL RESOURCES PRESERVATION

The Lua Kupapaʻu O Nohili (crypt) preserves and honors iwi kūpuna (ancestral remains) found on PMRF

Mānā Town Japanese cemetery from the sugar plantation days

NATURAL RESOURCES CONSERVATION THROUGH PARTNERSHIPS

Conservation of Laysan albatross through translocation program

Conservation of green sea turtles and their nests

Conservation of sensitive species at Honopū Valley

CLEAN ENERGY AND RESILIENCY THROUGH RENEWABLE ENERGY PROJECTS

Solar facility and battery energy storage system at PMRF

COMMUNITY SERVICE

Local scientists and students take part in natural resource surveys

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PMRF hosts the community at Earth Day events

E Pane Mai Ka Nonoi O Nohili

Answering the requests of Nohili

NEPA/HEPA/Historic Preservation Process and Community Involvement

WE WANT TO HEAR FROM YOU

The National Environmental Policy Act (NEPA); Section 106 of the National Historic Preservation Act (NHPA); Hawai‘i Revised Statutes (HRS) Chapter 343 and Hawai‘i Administrative Rules (HAR) Chapter 11-200.1, collectively referred to as the Hawai‘i Environmental Policy Act (HEPA); and HRS Section 6E-42 require federal agencies and the State of Hawai‘i Department of Land and Natural Resources, respectively, to:

- Consider the environmental impacts of proposed projects.
- Consider the potential effects of their actions on historic properties and look for ways to avoid, minimize, or mitigate them.
- Get early public input on resources and alternatives to be evaluated.

COMMUNITY INVOLVEMENT

Opportunities for formal public participation in the EIS process occur during two stages:

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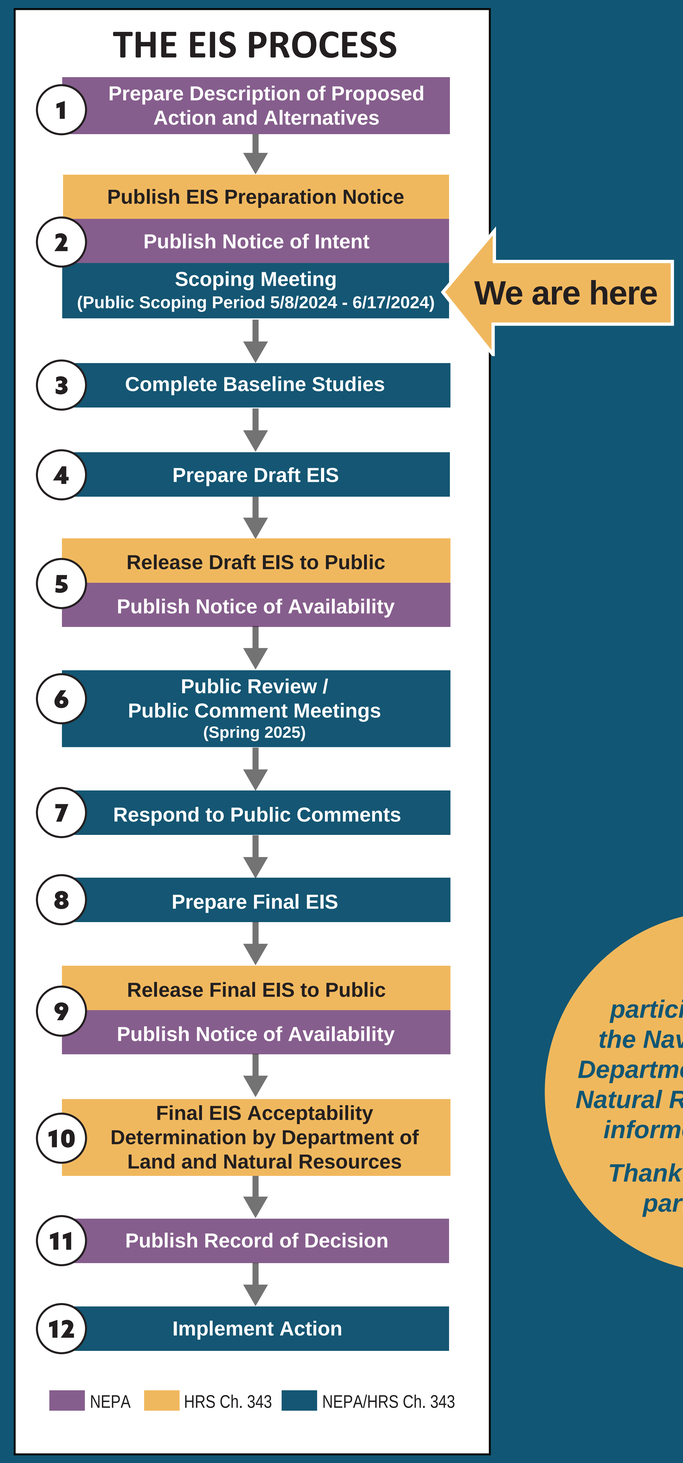

Public participation helps the Navy, NASA, and Department of Land and Natural Resources make informed decisions.

Thank you for your participation.

How to Submit Comments

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Submit comments by ***June 17, 2024***. The public may submit comments in any of the following ways:

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Attachment M

U.S. Navy Pacific Missile Range Facility and NASA Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

Public Scoping Fact Sheet

Public Scoping Meeting Schedule

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Welcome

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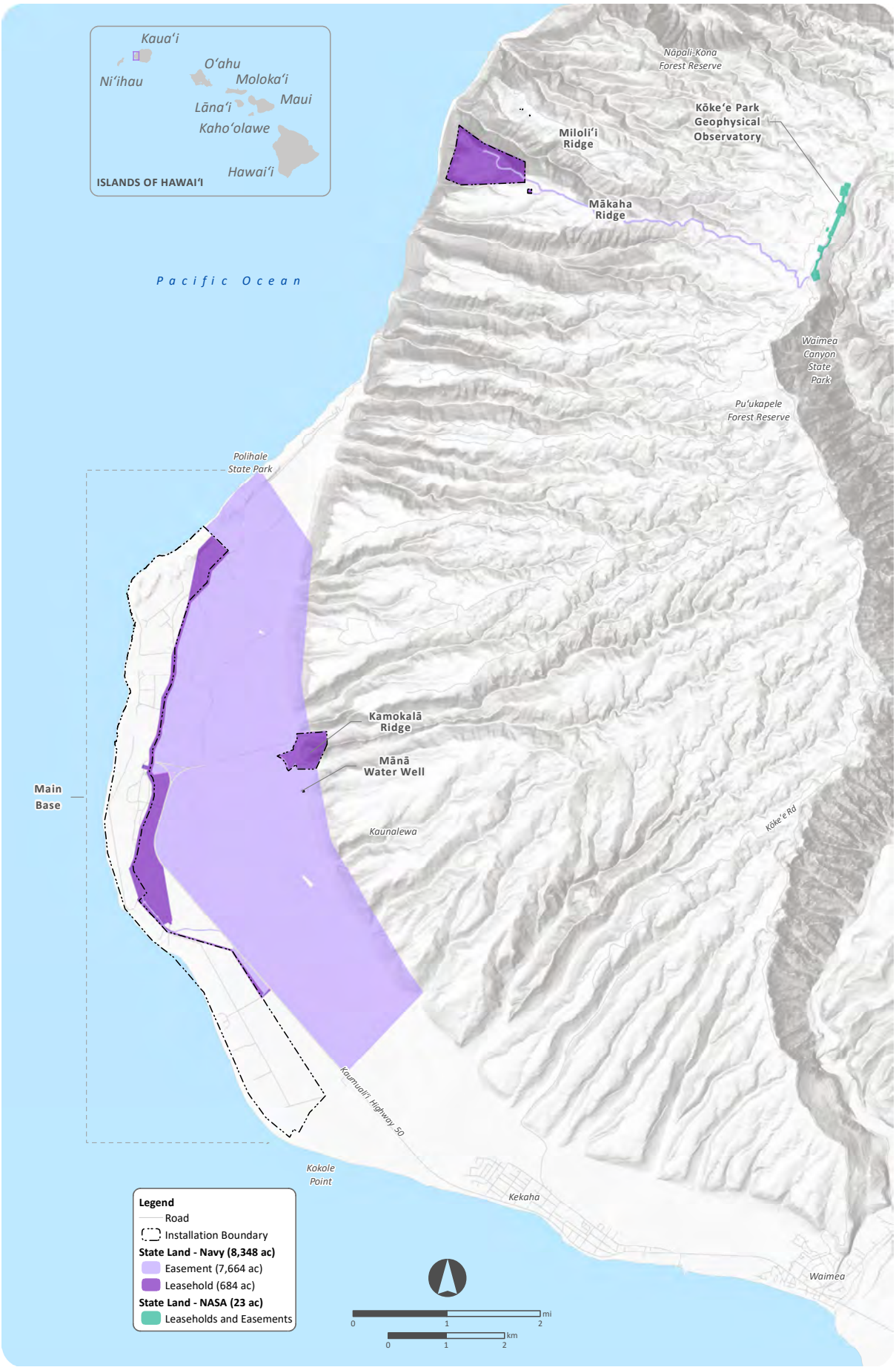


Figure 1. Project Map

Action Alternatives

Alternative 1: Succeeding Current Real Estate Agreements.

Under this alternative, the Navy and NASA would apply to the Department of Land and Natural Resources for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements. The Navy's agreements would include 684 acres of land leased exclusively by the Navy and 7,664 acres of easements. NASA's agreements would include 16 acres of land leased exclusively by NASA, 7 acres of easement lands, and would continue its Use Permit with the Navy. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds.

Under this alternative, the Navy and NASA would pursue fee simple acquisition of 700 acres (684 acres for Navy use and 16 acres for NASA use) of leaseholds, and otherwise obtain use of the remaining acreage as described in Alternative 1. The new Navy fee simple land of 684 acres would include 392 acres of land at the Main Base, 89 acres at Kamokalā Ridge, 0.29 acre at the Mānā Water Well, 0.015 acre at Miloli‘i Ridge, 203 acres at Mākaha Ridge, and the NASA fee simple land would include 16 acres at KPGO. This acreage would be transferred from ownership by the State of Hawai‘i to the United States. This alternative would not change any use or maintenance of existing infrastructure and would not involve construction, renovation, or demolition of facilities.

Alternative 3: No Action Alternative.

Under the No Action Alternative, the Navy and NASA would not seek any real estate agreements for the State lands on Kaua‘i after expiration of the leases and easements between 2027 to 2030. The current real estate agreements for 8,348 acres with the Navy and 23 acres with NASA would expire. All existing infrastructure would be removed, or abandoned in place, from Navy and NASA leased and easement lands.

Preliminary Environmental Resources to be Studied

The Navy and NASA propose to evaluate potential environmental impacts for each of the alternatives on the following resource areas. The public is invited to provide input on these and other resources that should be considered in the EIS.

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Biological Environment

- Biological resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

PMRF honors ancestral Native Hawaiians in summer solstice event.

Sea turtle on beach at PMRF.

Nohili Dunes.

Waiokapua Bay, at PMRF.

Hawai'i's state bird, the nēnē, or Hawaiian goose.

Solar panels at PMRF.

About the Navy Pacific Missile Range Facility and NASA Kōke`e Park Geophysical Observatory

Pacific Missile Range Facility

PMRF is the world's largest instrumented multi-domain training and testing facility. What makes PMRF unique is its ability to simultaneously support surface, subsurface, air, and space operations. For portions of PMRF, the Navy has lease agreements with the State of Hawai`i for 8,348 acres, comprised of 684 acres of leaseholds and 7,664 acres of easements. The Navy operates on 410 acres of the total acres leased from the State. The majority of the leased and easement areas remain intentionally undeveloped as they are used as an encroachment buffer and security for the facility's mission. For more information, visit https://cnrh.cnic.navy.mil/Installations/PMRF-Barking-Sands/

PMRF engages and actively participates with the community. Personnel who work at PMRF take great pride in their role as caretakers of the cultural and natural resources they are entrusted with. As the third largest employer on Kaua`i, many of the personnel are from the community.

Kōke`e Park Geophysical Observatory

NASA's Kōke`e Park Geophysical Observatory (KPGO) is located on a remote ridge within Kōke`e State Park. NASA operates the observatory to collect geodetic data that contributes to daily measurements of the Earth's orientation in space and rotation. This data is used for scientific studies and a wide variety of positioning and navigation applications. For more information, visit https://space-geodesy.nasa.gov/NSGN/sites/KPGO/KPGO.html

Preserving the long-term Department of Defense and NASA use of these State lands is critical for military readiness, continuation of ongoing military training and testing, and maintaining data collection efforts of global and local significance. It also ensures the continued conservation management by the Navy and NASA of natural and cultural resources on these lands.

PMRF and KPGO Timeline

- **1964 - 2007** — Navy and NASA enter into real estate agreements with the State of Hawai'i
- **1988** — Navy establishes Natural Resources Management Plan for PMRF
- **1998** — Navy establishes Integrated Cultural Resources Management Plan for PMRF
- **2014** — Navy establishes Readiness and Environmental Protection Integration Program projects for PMRF
- **2019** — Lua Kupapa'u O Nohili (crypt) is constructed
- **2027 - 2030** — Current real estate agreements expire

What is the Space Geodesy Project at KPGO?

The Space Geodesy Project (SGP) maintains a global network of space geodetic observing instruments. The network is comprised of sites around the world that use four primary observation techniques:

- Very Long Baseline Interferometry (VLBI)
- Satellite Laser Ranging
- Doppler Orbitography by Radiopositioning Integrated on Satellite (DORIS)
- Global Navigation Satellite System (GNSS)

The International Terrestrial Reference Frame (ITRF) is determined by the observations made from the instruments listed above and is the foundation for virtually all Earth observations and georeferenced data used by society. This data is fundamental for:

- Positioning and navigation in space/air and on land/sea
- Tracking sea level changes
- Tsunami early warning systems
- Volcano deformation measurements
- Predicting flood patterns
- Studying glacier dynamics

What is KPGO?

The Kōke`e Park Geophysical Observatory (KPGO) is one of the core sites for NASA's SGP. The mission of KPGO is to collect geodetic data to support the geolocation of Earth observation from both land and space as well as scientific investigations of the Earth's surface and interior.

Why is KPGO Important?

NASA and the scientific community use the data collected by KPGO to study ecosystems, water cycles, geological hazards, sea-level change, crustal-dynamics, and many other Earth science topics. Many of these applications rely on the long history and continuity of the geodetic data collected from the current KPGO location.

Why Kōke`e State Park?

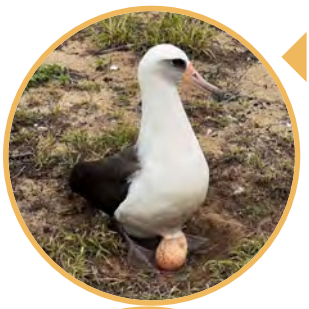
KPGO is in Kōke`e State Park at an elevation of 3,600 feet near the Waimea Canyon, isolated from radio broadcasts that would interfere with the sensitive measurements made by the VLBI system. The location on the island of Kaua`i is also critical for tying the Hawaiian Islands into the ITRF that contributes towards improving positioning and navigation accuracy on and around Hawai`i.

Stewardship and Care of the Land

Personnel who work at PMRF take great pride in their role as caretakers of the cultural and natural resources they are entrusted with.

E Pane Mai Ka Nonoi O Nohili
Answering the requests of Nohili

NATURAL RESOURCES CONSERVATION THROUGH PARTNERSHIPS



Conservation of Laysan albatross through translocation program.

Conservation of green sea turtles and their nests.

Conservation of sensitive species at Honopū Valley.

CULTURAL RESOURCES PRESERVATION

The Lua Kupapa'u O Nohili (crypt) preserves and honors iwi kūpuna (ancestral remains) found on PMRF.

Mānā Town Japanese cemetery from the sugar plantation days.

COMMUNITY SERVICE

Local scientists and students take part in natural resource surveys.

PMRF celebrates with the community at Kekaha Family Fun Day.

PMRF hosts the community at Earth Day events.

CLEAN ENERGY AND RESILIENCY THROUGH RENEWABLE ENERGY PROJECTS

Solar facility and battery energy storage system at PMRF.

In 2023, the Department of Defense Readiness and Environmental Protection Integration (REPI) program awarded $5.29 million to natural resource conservation projects on Kaua`i. Approximately $26.7 million was awarded for all of Hawai`i.

NEPA/HEPA/Historic Preservation Process and Community Involvement

The Navy and NASA are jointly preparing the EIS pursuant to the National Environmental Policy Act (NEPA). The EIS will also be used by the Hawai`i Department of Land and Natural Resources under Hawai`i Revised Statutes (HRS) Chapter 343 and Hawai`i Administrative Rules Chapter 11-200.1, collectively referred to as the Hawai`i Environmental Policy Act (HEPA), in its decision making as to whether and what type of real estate agreement it may grant the Navy and NASA.

The EIS Process diagram (at right) illustrates the stages of public involvement in the NEPA and HEPA environmental processes. The public involvement processes for NEPA and HEPA for this EIS are running concurrently to meet the requirements for both state and federal laws and regulations.

The NEPA/HEPA scoping meetings will also serve as an opportunity to obtain public input concerning potential effects to historic properties pursuant to Section 106 of the National Historic Preservation Act (NHPA) and HRS Section 6E-42.

Community Involvement

The Navy and NASA are initiating a public scoping process to receive comments on the scope of the EIS. Members of the public are encouraged to participate in the environmental planning process by providing input on the proposed real estate action including potential alternatives, environmental or cultural concerns, information the public would like the Navy and NASA to know, and any other information the public would like to see addressed in the EIS, and the project's potential to affect historic properties pursuant to Section 106 of the NHPA and HRS Section 6E-42.

The Navy and NASA are proud contributing members of the local community. The Navy and NASA value and welcome input from the community, as well as the chance to share, communicate, and inform the community about the EIS and the need for the real estate agreements.

Opportunities for formal public participation in the EIS process occur during two stages:

1. During the scoping period, following publication of the Notice of Intent (NOI) and the Environmental Impact Statement Preparation Notice (EISPN).
2. During the comment period following publication of the Draft EIS.

What is Scoping?

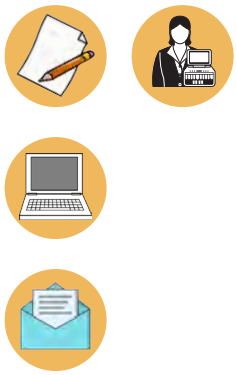
Scoping occurs at the beginning of the NEPA/HEPA process to help the Navy and NASA understand community-specific concerns regarding the Proposed Action and the planned analysis. Scoping encourages the participation of other federal, state, and local agencies, Native Hawaiian Organizations, environmental, cultural, and other groups, and the general public. Scoping helps determine what should be studied in this EIS including the alternatives and resources to be analyzed.

How to Submit Comments

Submit Comments in Person, Online, or by Mail.

Submit comments by ***June 17, 2024***. The Navy and NASA encourage the public to attend a public scoping meeting and to visit the project website to learn more.

The public may submit comments in any of the following ways:



- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, **postmarked by *June 17, 2024*** to the following address:

  Naval Facilities Engineering Systems Command, Hawai`i
  Environmental OPHEV2
  Attention: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860

For language assistance or special accommodations, contact the PMRF Public Affairs Officer, at (808) 335-4740 or PMRFPublicAffairs@us.navy.mil.

Notes:

We appreciate your time and interest.

For more information visit the project website at PMRF-KPGO-EIS.com

Public Scoping Meeting Comment Form

Date: _____

Please submit comments for the scoping process by June 17, 2024. The Navy and NASA encourage the public to speak to project representatives available at tonight's meeting and to visit the website for project updates. The public may submit comments in any of the following ways:

- In person at a public scoping meeting
- Through the project website at **PMRF-KPGO-EIS.com**
- By email to **info@PMRF-KPGO-EIS.com**
- By mail, postmarked by June 17, 2024 (see address below)

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Please provide your mailing address to receive future notifications about the project.

1. Name:_____
2. Organization/Affiliation (if applicable): _____
3. Mailing Address:_____

In the event the contents of specific comments are incorporated into the environmental review analysis, released in whole or in part in response to a Freedom of Information Act request, or otherwise disclosed to the public, the Navy and NASA will include the name of the individual or entity submitting the comment, but will not publish or otherwise disclose other potentially-identifying information such as home addresses, e-mail addresses, or telephone numbers.

Please turn in this form at a public scoping meeting, submit online at PMRF-KPGO-EIS.com, send by email to info@PMRF-KPGO-EIS.com or mail to:

Naval Facilities Engineering Systems Command, Hawaiʻi, Environmental OPHEV2
Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

** Please Print Clearly **

YOUR INPUT MATTERS

Visit PMRF-KPGO-EIS.com

Scan QR code for project website

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Attn: PMRF and KPGO RE EIS Project Manager, Ms. Kerry Wells
400 Marshall Road, Building X-11
Pearl Harbor, HI 96860

** Please Print Clearly **

YOUR INPUT MATTERS

Visit PMRF-KPGO-EIS.com

Scan QR code for project website

ORAL COMMENT FORM

Please provide this form to the court reporter.

Meeting Location

- ☐ Līhuʻe, HI
- ☐ Kekaha, HI
- ☐ Kapaʻa, HI

Please provide the following information. Please print clearly.

Note: Your address, phone number, and email address will not be made public.

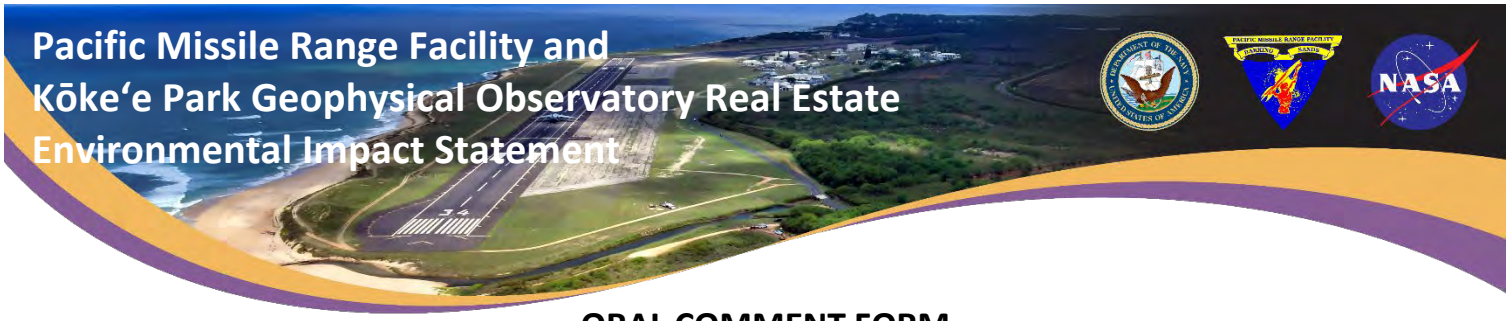
First and Last Name: _____

Organization representing (if any): _____

Address: _____

Phone: _____

Email: _____



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First and Last Name: _____

Organization representing (if any): _____

Address: _____

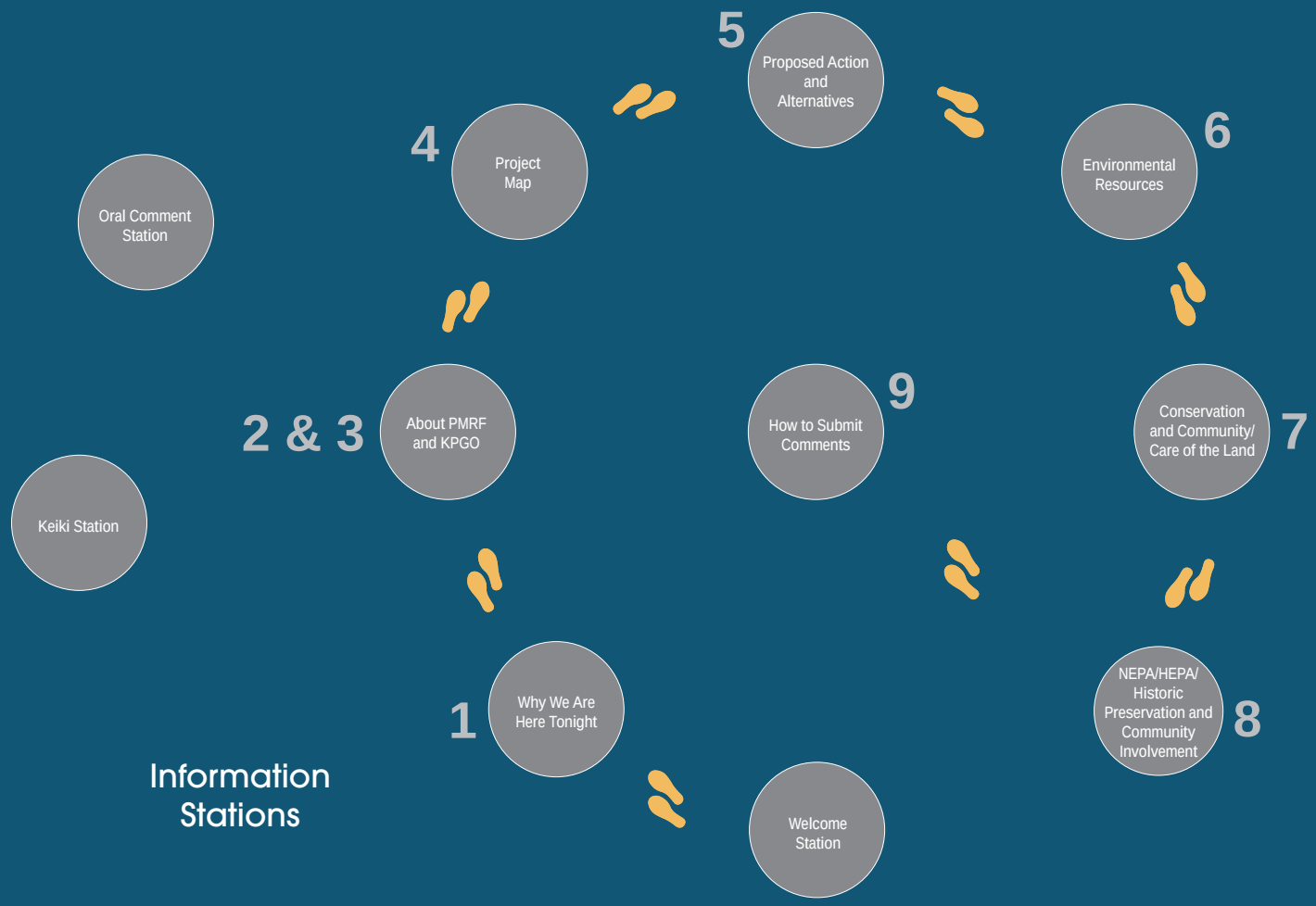
Phone: _____

Email: _____

U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Aloha and Welcome

Mahalo for joining us this evening. Please visit the information stations to meet the project team, talk story, and ask questions. Visit the comments station to provide a written or oral comment.



Information Stations

PMRF-KPGO-EIS.com

Attachment N

E Pane Mai Ka Nonoi O Nohili

Answering the requests of Nohili

U.S. Navy Pacific Missile Range Facility and NASA Kōke'e Park Geophysical Observatory Real Estate Environmental Impact Statement

Aloha and Welcome

Your participation is important to this planning process

PMRF-KPGO-EIS.com

E Pane Mai Ka Nonoi O Nohili
Answering the requests of Nohili

2024 Public Scoping Meetings for the U.S. Navy Pacific Missile Range Facility and NASA Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

June 4 - Kauaʻi Veterans Center, Līhuʻe

June 5 - Kekaha Neighborhood Center, Kekaha

June 6 - Sheraton Kauaʻi Coconut Beach Resort, Kapaʻa

Scan QR code for project website

PMRF-KPGO-EIS.com

Public Scoping Meeting Agenda

- Meet & Greet at Poster Stations
- Project Presentation
- Return to Poster Stations

Purpose of Today's Meeting

- This is the beginning of the environmental review process.
- The Navy and NASA invite you to participate and to provide your comments.
- Your comments can help the Navy and NASA evaluate potential environmental impacts.
- This is also an opportunity to provide input on potential effects to historic properties.

About the Pacific Missile Range Facility (PMRF)

- PMRF is the world's largest instrumented multi-domain training and testing facility.
- It is unique because it can simultaneously support surface, subsurface, air, and space operations.
- PMRF brings about $150 million annually to Kaua'i County.
  - Approximately 1,000 personnel
  - Largest high-tech employer on Kaua'i
  - Third largest overall employer on Kaua'i
- Personnel at PMRF engage and actively participate with the community.

Conservation and Community

Stewardship and Care of the Land

Personnel who work at PMRF take great pride in their role as caretakers of the cultural and natural resources they are entrusted with.

- Natural Resources Conservation through Partnerships
- Clean Energy and Resiliency through Renewable Energy Projects
- Cultural Resources Preservation
- Community Service

About the Kōke‘e Park Geophysical Observatory (KPGO)

- KPGO is located on a remote ridge in Kōke‘e State Park.
- NASA operates KPGO to collect data about the Earth’s shape, orientation in space, and gravity.
- Navy uses KPGO to conduct PMRF mission support with radar, telemetry, and communications services.
- The data collected at KPGO is of global and local importance.

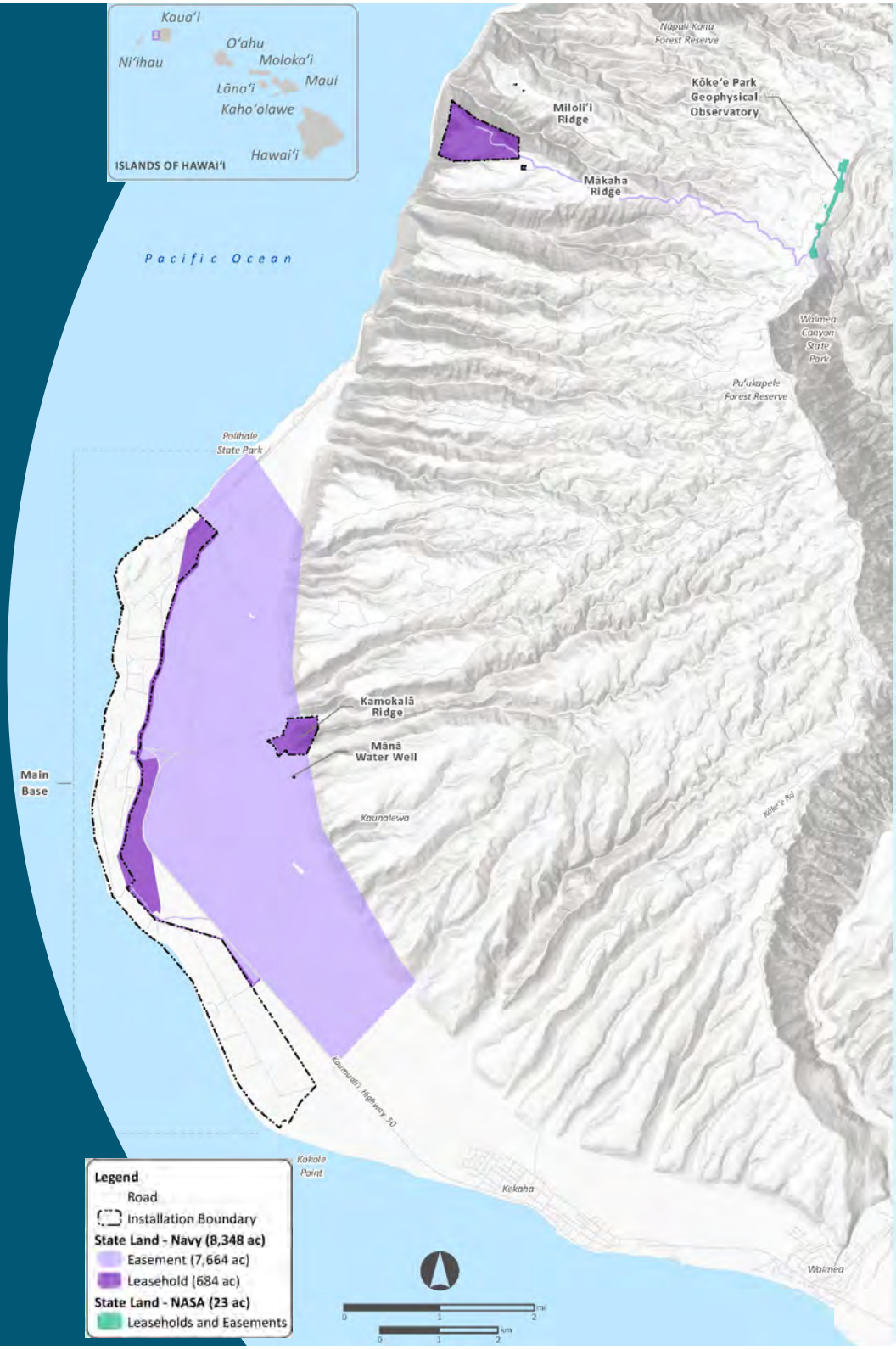
Current Land Management West Kaua‘i

Kōke‘e Park Geophysical Observatory

- NASA has 16 acres of leaseholds and 7 acres of easements for operation of KPGO.
- NASA issued a Use Permit to the Navy for portions of KPGO.

West Kaua‘i

- Navy has 684 acres of leaseholds and 7,664 acres of easements for portions of PMRF.
- The Navy operates on 410 acres of the total 8,348 acres leased.



Proposed Action

- Navy and NASA real estate agreements are set to expire between 2027 and 2030.
- Navy proposes to maintain long-term Department of Defense use of 8,348 acres of State lands on Kaua‘i for operational continuity and sustainment of the military readiness mission.
- NASA proposes to maintain long-term use of the 23 acres of leaseholds and easements for continued operation of KPGO.

Preliminary Alternatives

The Navy and NASA propose to evaluate the potential environmental impacts of each of the alternatives.

Alternative 1: Succeeding Current Real Estate Agreements

- Navy and NASA would apply to the Department of Land and Natural Resources for new long-term real estate agreements in the same manner, similar duration, and for the same uses as the current leases and easements.

Preliminary Alternatives

Alternative 2: Fee Simple Acquisition of Current Real Estate Agreements for Leaseholds

- Navy would pursue fee simple acquisition of the 684 acres at fair market value and obtain succeeding easements for the remaining acres currently held.
- NASA would pursue fee simple acquisition of the 16 acres of leaseholds at fair market value and obtain succeeding easements for the remaining 7 acres currently held.

Alternative 3: No Action Alternative

- Navy and NASA would not seek any real estate agreements for the State lands after expiration.

Environmental Resources

Social Environment

- Archaeological and historic resources
- Cultural practices
- Visual resources
- Public health and safety
- Land use
- Socioeconomics
- Environmental justice

Physical Environment

- Air quality and greenhouse gases
- Water resources

Biological Environment

- Biological resources

Built Environment

- Utilities
- Transportation
- Hazardous materials and wastes

The public is invited to provide input on these and other resources that should be considered in the Environmental Impact Statement.

THE EIS PROCESS

1. Prepare Description of Proposed Action and Alternatives
2. Publish EIS Preparation Notice
   Publish Notice of Intent
   Scoping Meeting
   (Public Scoping Period 5/8/2024 - 6/17/2024) ← We are here
3. Complete Baseline Studies
4. Prepare Draft EIS
5. Release Draft EIS to Public
   Publish Notice of Availability
6. Public Review / Public Comment Meetings
   (Spring 2025)
7. Respond to Public Comments
8. Prepare Final EIS
9. Release Final EIS to Public
   Publish Notice of Availability
10. Final EIS Acceptability Determination by Department of Land and Natural Resources
11. Publish Record of Decision
12. Implement Action

NEPA | HRS Ch. 343 | NEPA/HRS Ch. 343

How to Submit Comments

- In person at a public scoping meeting
- Online at: **PMRF-KPGO-EIS.com**
- Via email to: **info@PMRF-KPGO-EIS.com**
- Mail written comments to:
  Naval Facilities Engineering Systems Command, Hawai‘i
  Environmental OPHEV2
  Attn: PMRF and KPGO RE EIS Project Manager,
  Ms. Kerry Wells
  400 Marshall Road, Building X-11
  Pearl Harbor, HI 96860
- **PMRF Public Affairs Officer:** (808) 335-4740, or PMRFPublicAffairs@us.navy.mil

Scan QR code for project website

Submit comments by June 17, 2024

Scoping Meeting Schedule

Tuesday, June 4, 2024 (5 to 8 p.m.)
Kaua‘i Veterans Center
3215 Kaua'i Veterans Memorial Hwy, Līhu‘e

Wednesday, June 5, 2024 (5 to 8 p.m.)
Kekaha Neighborhood Center
8130 Elepaio Road, Kekaha

Thursday, June 6, 2024 (5 to 8 p.m.)
Sheraton Kaua‘i Coconut Beach Resort
650 Aleka Loop, Kapa‘a

Scan QR code for project website

PMRF-KPGO-EIS.com

Appendix K

Natural Resource Surveys and Relevant Biological Opinions

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PMRF Flora Survey Report

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Final

Vegetation Survey Report at Pacific Missile Range Facility in Support of Pacific Missile Range Facility and Kōke‘e Park Geophysical Observatory Real Estate Environmental Impact Statement

Kaua‘i, Hawai‘i

Prepared for:

Department of the Navy
Naval Facilities Engineering Systems Command, Pacific
258 Makalapa Drive, Suite 100
Joint Base Pearl Harbor-Hickam, HI 96860-3134

Prepared under: Contract N62742-18-D-1802, Task Order N6274222F0206

January 2024

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Final
Vegetation Survey Report in Support of
Pacific Missile Range Facility and Kōkeʻe Park
Geophysical Observatory Real Estate
Kauaʻi, Hawaiʻi

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Appendix A Survey Photographic Record
Appendix B Complete List of Species Observations

ACRONYMS AND ABBREVIATIONS

DLNR	Department of Land and Natural Resources
DON	Department of the Navy
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GIS	geographic information system
GPS	global positioning system
INRMP	Integrated Natural Resources Management Plan
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Systems Command
NEPA	National Environmental Policy Act
PMRF	Pacific Missile Range Facility
SOW	Statement of Work
USFWS	United States Fish and Wildlife Service

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

This vegetation survey report details the results of vegetation mapping and plant surveys at Pacific Missile Range Facility (PMRF) in support of the proposed PMRF and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). The United States (U.S.) Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA), in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR), are preparing an EIS which evaluates the potential environmental consequences of the Navy's and NASA's proposal to retain the use of approximately 8,348 acres and 23 acres, respectively, in support of the Navy's continued and ongoing operational continuity and sustainment at PMRF and NASA's continued operations at KPGO. The Navy's 8,348 acres are a part of the larger PMRF installation which includes the entire instrumented range on land and ocean areas that support surface, subsurface, air, and space operations.

Between 1964 and 2007, the Navy and NASA began leasing property from the DLNR-owned land primarily for passive encroachment buffer as well as for mission operations, access, and utilities at the following five general locations: Main Base (also referred to as Barking Sands), Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge. The easement areas provide safety buffer zones for training and testing missions and prevent incompatible development. The existing Navy and NASA real estate agreements with the DLNR are set to expire between 2027 and 2030.

Under the direction of Naval Facilities Engineering Systems Command (NAVFAC), and in accordance with the 19 July 2022 Statement of Work (SOW) for Task Order N6274222F0206, Stantec GS Inc. ("Stantec") performed vegetation surveys within identified survey area components of the PMRF and KPGO real estate study area in Kauaʻi, Hawaiʻi (Figure 1-1). Survey results will be used for future project planning; development of potential avoidance and minimization measures; National Environmental Policy Act analysis; Chapter 343, Hawaiʻi Revised Statutes (commonly referred to as HEPA) and Hawaiʻi Administrative Rules Section 11.200-1 analysis; and/or potential Endangered Species Act (ESA) section 7 consultation.

A work plan and desktop analysis were prepared in August 2023 to inform what vegetation resources may exist in the survey area, and also outlined the proposed methodology, data management, reporting, scheduling, and personnel roles during the prescribed fieldwork (NAVFAC Pacific, 2023a). This field report summarizes the vegetation surveys that occurred in October 2023.

1.2 PURPOSE AND OBJECTIVE OF THE SURVEY

The purpose of the vegetation surveys was to document special status plant species (those having either federal or state protective status) presence, map plant community/land cover types, and document invasive plant species within the survey area at PMRF. The primary objective of the vegetation surveys was to identify what terrestrial vegetation resources exist within the survey area to support any environmental evaluations and consultations potentially required by laws, regulations, or policies.

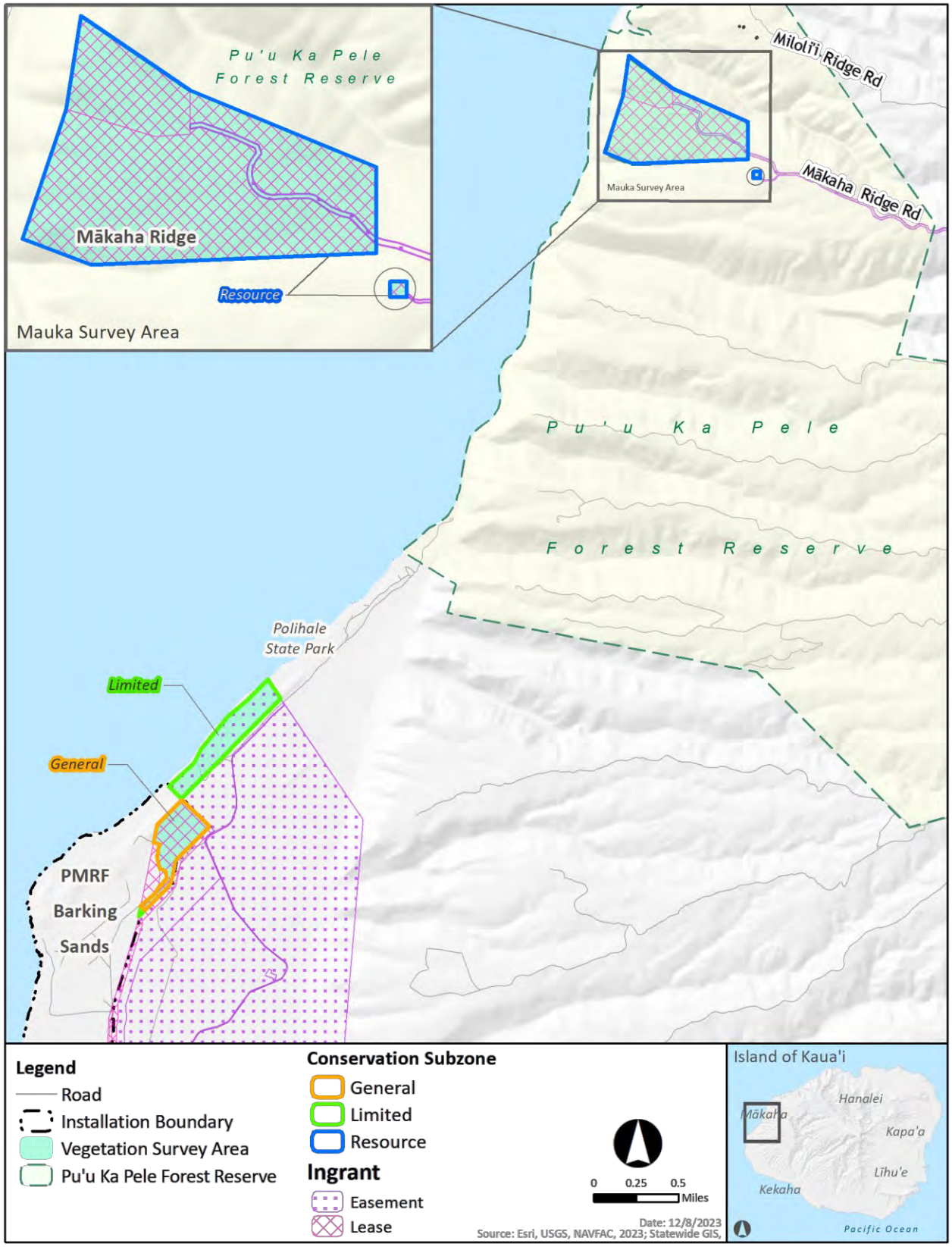

Figure 1-1 PMRF General Location Map

1.3 SURVEY AREA

The identified vegetation survey area was approximately 306 acres. The vegetation survey area includes the following three areas:

1) Approximately 167.1 acres around the Mākaha Ridge Tracking Station (Resource Conservation Subzone on Figure 1-1)
2) Approximately 69.6 acres along the coastal areas at PMRF, within Polihale State Park (Limited Conservation Subzone on Figure 1-1)
3) Approximately 69.6 acres approximately 800 feet inland at PMRF (General Conservation Subzone on Figure 1-1)

Elevations at the Mākaha Ridge Tracking Station range from approximately 860 to 1,880 feet above sea level, and elevations at the coastal areas range from approximately 20 to 80 feet above sea level. The Mākaha Ridge survey area is located within the Division of Forestry and Wildlife Pu‘u Ka Pele Forest Reserve.

1.4 SURVEY SCHEDULE AND PERSONNEL

Surveys were conducted on five consecutive days from 8 October to 12 October 2023. Survey start/end times and weather descriptions for each survey day are included in Table 1-1.

Table 1-1 Survey Dates, Times, and Weather Conditions

Survey Date[a]	*Start Time*	*End Time*	*Weather Conditions*
8 October 2023	8:30 a.m.	4:30 p.m.	Clear, no wind, no rain, mid-80s (°F)
9 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
10 October 2023	8:00 a.m.	4:30 p.m.	Clear, little wind, no rain, mid-80s (°F)
11 October 2023	8:30 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
12 October 2023	8:30 a.m.	2:00 p.m.	Clear, little wind, no rain, mid-80s (°F)

Note: [a]Survey date and time noted in Hawaii Standard Time.
Legend: °F = degree Fahrenheit.

The team members involved in performing the project tasks are listed in Table 1-2 along with their project-specific roles. The field survey personnel consisted of Michele Lefebvre, Taylor Marsh, and Jessica Hawkins.

Table 1-2 Vegetation Survey Team Personnel

Role	*Name*
Project Manager	Ben Berridge
Biologist	Michele Lefebvre
Biologist	Taylor Marsh
Biologist	Jessica Hawkins
Senior Biologist/Review	Clint Scheuerman
Senior Biologist/Review	John Lowenthal
GIS Specialist	Christine Chaplin

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CHAPTER 2
VEGETATION DESKTOP ANALYSIS

2.1 EXISTING DATA IN THE VEGETATION SURVEY AREA

The following existing data was reviewed to determine the potential habitat in the vegetation survey area and potential for special status species:

1) Soil data (Natural Resources Conservation Service, 2023).
2) Previous biological survey results, including previously mapped vegetation communities at PMRF (NAVFAC Pacific, 2010, 2021, 2023b).
3) DLNR plant species of greatest conservation need identified in the State Wildlife Action Plan (DLNR, 2015, 2023).
4) United States Fish and Wildlife Service (USFWS) federally listed species habitat and occurrences (USFWS, 2023).

2.2 SPECIAL STATUS PLANT SPECIES HABITAT REVIEW

Table 2-1 provides a list of special status plant species identified during review of the existing data as well as known habitat and whether potential habitat for the species occurs in the vegetation survey area.

Table 2-1 Special Status Plant Species with Potential to Occur in the Vegetation Survey Areas

Scientific Name	*Common Name*	*Federal Status*	*Known Habitat and Occurrences*	*Potential to Occur in the Vegetation Survey Area*
Species at the Coastal Survey Area				
Panicum niihauense	Lauʻehu	Endangered	This perennial bunchgrass is currently only known to occur on Kauaʻi. Habitat includes dry coastal areas including calcareous sand dunes and rocky knolls. The last known population is located on State-owned land at Polihale State Park (NAVFAC Pacific, 2010).	The survey area along the coast overlaps with known critical habitat for this species. The northern portion of the survey area is located within Polihale State Park, which is where the last known population was recorded; therefore, potential habitat is considered present in the vegetation survey area.
Sesbania tomentosa	ʻOhai	Endangered	This shrub to small tree is known to occur on Oʻahu, Molokaʻi, Maui, Kauaʻi, Kahoʻolawe, and Hawaiʻi. Habitat includes dry forests, often coastal and less often inland. It is found on calcareous beaches and sand dunes, rocky ridges and slopes, deep red soil, and on soil pockets on lava (NAVFAC Pacific, 2010).	The vegetation survey area along the coast overlaps with known critical habitat for this species.
Species at the Mākaha Ridge Survey Area				
Lobelia niihauensis	Niʻihau lobelia	Endangered	This prostrate branched shrub is known to occur on Kauaʻi and Oʻahu in mesic forest and dry cliffs. Six individuals of this species were located during a 2019 unmanned aerial vehicle survey at the Mākaha Ridge facility (Nyberg, 2019). Occupied habitat for this species is located on the cliffs west of the vegetation survey area.	Although no cliff habitat will be surveyed in the vegetation survey area at Mākaha Ridge, potential habitat could occur in mesic forest in this area.

Scientific Name	***Common Name***	***Federal Status***	***Known Habitat and Occurrences***	***Potential to Occur in the Vegetation Survey Area***
Peucedanum sandwicense	Makou	Threatened	On Kaua‘i, this sprawling herb occurs on cliff habitats in mixed shrub coastal drill cliff communities or diverse mesic forest. Six individuals of this species were located during a 2019 unmanned aerial vehicle survey at the Mākaha Ridge facility (Nyberg, 2019). Occupied habitat for this species is located on the cliffs north of the vegetation survey area.	Although no cliff habitat will be surveyed in the vegetation survey area at Mākaha Ridge, potential habitat could occur in mesic forest in this area.
Schiedea apokremnos	Ma‘oli‘oli	Endangered	This low, branching perennial shrub occurs in the crevices of nearly vertical coastal cliffs. There were 152 individuals of this species located during a 2019 unmanned aerial vehicle survey at the Mākaha Ridge facility (Nyberg, 2019). Occupied habitat for this species is located on the cliffs north of the vegetation survey area.	Since no vertical cliff habitat will be surveyed, this species is not expected to be found in the Mākaha Ridge vegetation survey area.
Wilkesia hobdyi	Dwarf ili‘au	Endangered	This shrub is a Kaua‘i endemic known to occur on coastal cliffs, dry cliffs, or very dry ridges from 500 to 1,500 feet. Only 10 populations with a total of 759–809 individuals are thought to exist in the northwestern region of Kaua‘i. Around the Mākaha Ridge Tracking Station, 11 colonies were documented, totaling 214 individuals. The Mākaha Ridge Tracking Station populations range in size from 1 individual to 50 individuals. The plants are found on the denser, harder rock outcrops with nearly vertical faces and out of reach of the goats that frequent the area (NAVFAC Pacific, 2010). In 2019, 3,635 individuals were located during an unmanned aerial vehicle survey at the Mākaha Ridge facility (Nyberg, 2019). Occupied habitat for this species is located on the cliffs north and west of the vegetation survey area.	According to the PMRF INRMP (NAVFAC Pacific, 2023c), there are known populations on the northern boundary of the Mākaha Ridge survey area and just south of the survey area and, therefore, potential habitat is considered present in the survey area.
Spermolepis hawaiiensis	None	Endangered	On Kaua‘i, this ephemeral, annual herb is known to occur in ‘ohia (*Metrosideros polymorpha*) forest and a‘ali‘i (*Dodonaea viscosa*) lowland dry shrubland mesic cliffs at elevations between 184 and 2,377 feet. Two significant colonies grow on north facing, precipitous slopes around the Mākaha Ridge Tracking Station and represent approximately 700 individuals (NAVFAC Pacific, 2010).	According to the PMRF INRMP (NAVFAC Pacific, 2023c), there are known populations just south of the Mākaha Ridge survey area and, therefore, potential habitat is considered present within the survey area.

Legend: INRMP = Integrated Natural Resources Management Plan; NAVFAC = Naval Facilities Engineering Systems Command; PMRF = Pacific Missile Range Facility.

2.3 INVASIVE PLANT SPECIES

Although PMRF employs a number of management actions to prevent introduction and control the spread of invasive vegetation species, a number of invasive and/or noxious species have been identified for control by PMRF Environmental and Navy Natural Resources staff. These species include long-thorn kiawe (*Prosopis juliflora*), kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), and buffelgrass (*Cenchrus ciliaris*) (NAVFAC Pacific, 2010).

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CHAPTER 3
SURVEY METHODOLOGY

3.1 TERRESTRIAL SURVEY METHODS

Vegetation surveys were conducted by two to three terrestrial biologists in the areas shown on Figure 1-1 using the provided geographic information system (GIS) boundaries for the survey area. Surveyors walked in relative parallel fashion through the survey area while carrying a portable global positioning system (GPS) unit with a tracking application that continuously tracked the movements of the surveyors, as depicted by the survey tracks in Figures 3-1 and 3-2. Vegetation survey tracks are representative of one surveyor's GPS tracks. The other surveyors were generally 30 to 45 feet away depending on localized conditions and vegetation density. Surveyors did not traverse where steep topography prevented safe access and minimized traversing in dense vegetation due to the lack of suitable habitat for species listed in Table 2-1.

Personnel surveyed all habitat types and conducted a presence/absence pedestrian survey for all potentially occurring special status plant species with an emphasis on the species listed in Table 2-1. At Mākaha Ridge, in portions of the survey area that consisted of open, eroded areas or very dense understory vegetation consisting of lantana (*Lantana camara*), surveyors walked meandering survey paths to ensure full visual coverage. Likewise, surveyors walked meandering paths in portions of the coastal survey area that were dominated by koa haole and kiawe communities, where there was full visual coverage in the dune areas, and where large piles of debris northeast of the base consisting of barbed wire, concrete, and asphalt occurred. In all cases, the surveyors had visual coverage of the survey area.

Vegetation and land cover types were mapped on physical maps (with an aerial background) and later digitized, using waypoint data that was collected in the field to identify boundaries (ecotones) between communities. Special status plant species observations were also recorded during these surveys.

Where special status plant species were identified, surveyors mapped the location(s) of species and collected baseline data with the portable GPS unit (refer to Section 3.3 for the types of data collected). For individual plants of interest observed, a single point was collected on the GPS to map the location of the individual.

During the course of the surveys, surveyors collected representative photographs of special status plants and plant communities. A photographic record of the surveys is provided in Appendix A. In addition, surveyors identified all plant species encountered to the lowest taxonomic level, given parts of the plants observed at the time of the survey. A complete list of plant species observed is included in Appendix B.

3.2 SURVEY EQUIPMENT AND STANDARDS

The survey team was equipped with one portable/handheld Eos Arrow 100 GPS unit with sub-meter level mapping accuracy (Eos 2023). Following surveys, data were downloaded each day. Field survey personnel were equipped with proper clothing, personal protective equipment, and binoculars.

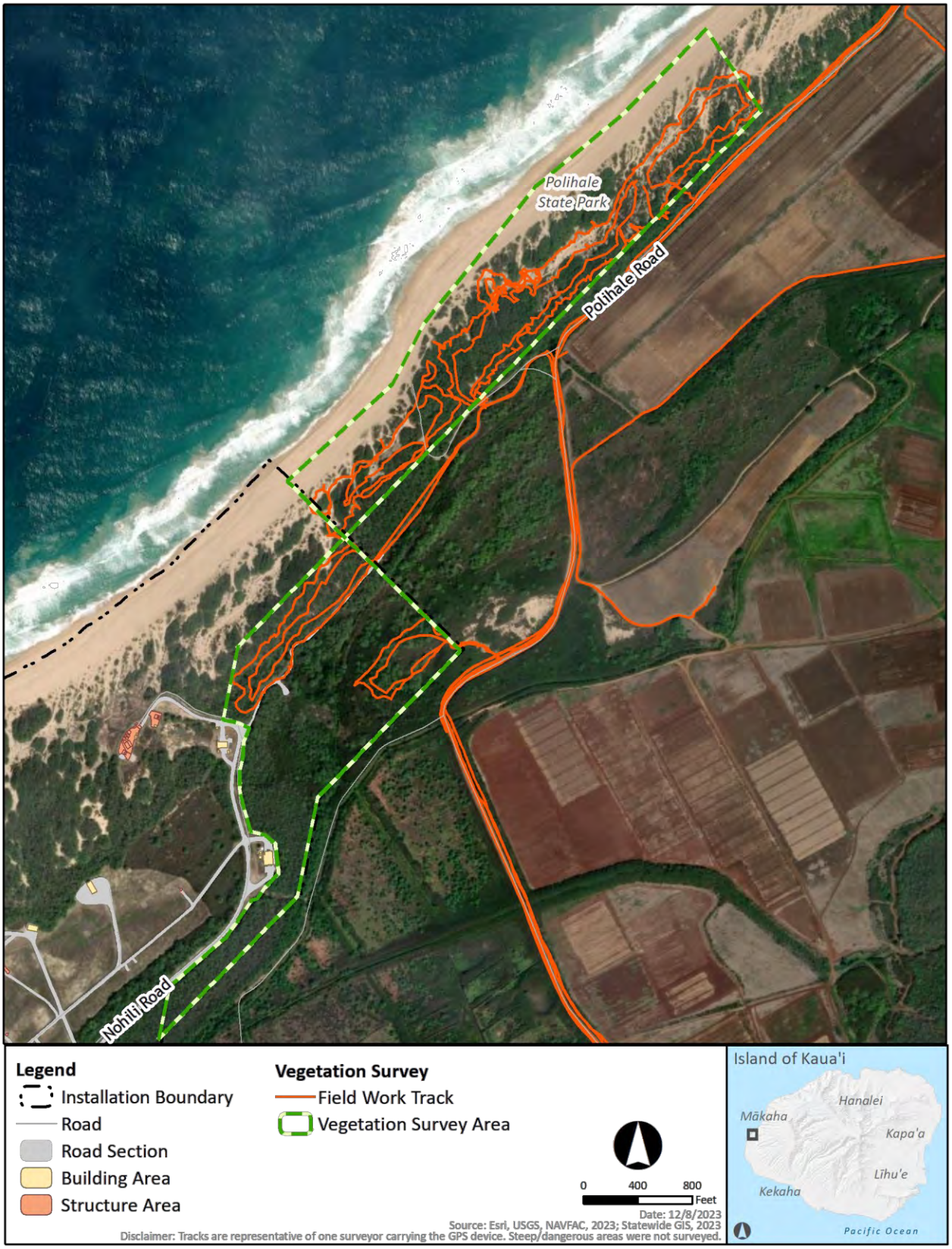

Figure 3-1 Survey Tracks at Coastal and Inland Areas of PMRF

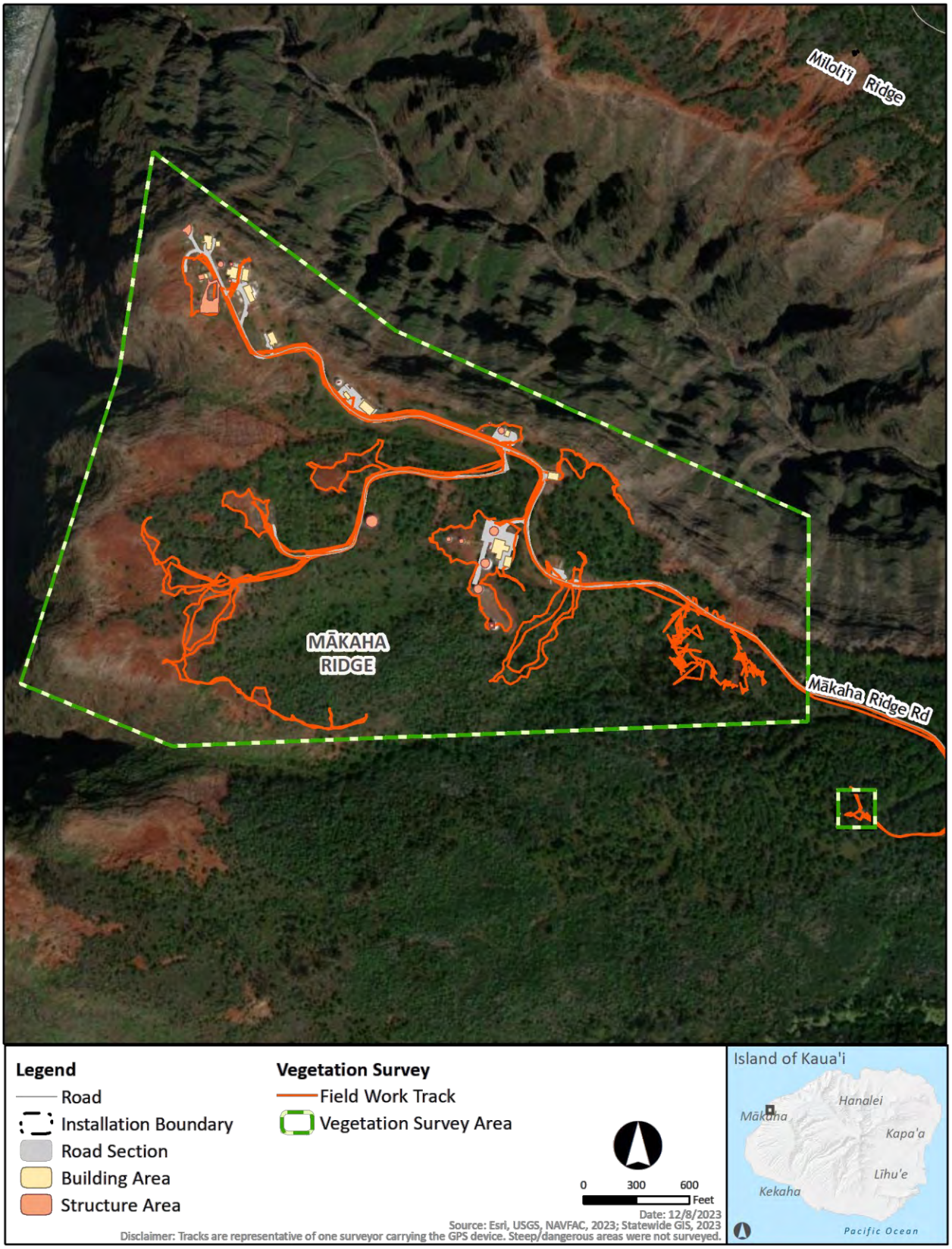

Figure 3-2 Survey Tracks at Mākaha Ridge

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CHAPTER 4
SURVEY RESULTS

Results of the vegetation surveys are summarized in Tables 4-1 through 4-3 and are depicted in Figures 4-1 through 4-3. Appendix A contains a photographic record of the survey area. Appendix B contains a complete list of plant species observed during the surveys. All GIS survey data collected in the field have been provided to NAVFAC Pacific as a part of this deliverable.

4.1 SPECIAL STATUS PLANT SPECIES

Table 4-1 details the survey data collected for the special status plant species that were observed and mapped. In total, four individual *Panicum niihauense* (lauʻehu) were observed and mapped. The location of these individuals is shown on Figure 4-1, and are shown on Photos 23 through 26 in Appendix A. A discussion is provided in Section 5.

Table 4-1 Special Status Plant Species Observed

Scientific Name	*Common Name*	*Federal Status*	*Mapped Individuals*	*Life Stage/Condition/Notes*
Panicum niihauense	Lauʻehu	Endangered	4	Observed in two locations approximately 15 feet apart. First location with one mature senesced individual (with flowers) and one living mature individual (with flowers). Second location with two immature living individuals (no flowers).

Although the coastal portion of the survey area is located within critical habitat for ʻohai (*Sesbania tomentosa*), no individuals were detected. In the same dune area where the *Panicum niihauense* individuals were located, outplanting tags for ʻohai were also located (Photos 16 and 17, Appendix A); however, no individuals were located during the survey.

4.2 VEGETATION AND LAND COVER TYPES

Plant community and land cover mapping of the vegetation survey area was conducted concurrently during special status plant species surveys. Surveyors visually assessed all portions of the survey area and mapped existing plant community and land cover locations and boundaries.

Based on the observations during field surveys, vegetation communities at the coastal survey area matched those communities mapped in the 2010 Integrated Natural Resources Management Plan (INRMP) while vegetation communities at Mākaha Ridge Survey Area more closely matched communities mapped in the 2023 Draft INRMP (NAVFAC, 2021, 2023c).

Tables 4-2 and 4-3 provide the acreage of each vegetation and land cover type documented in both survey areas (Figures 4-2 and 4-3).

Figure 4-1 Special Status Plant Species: *Panicum niihauense*

Figure 4-2 Coastal and Inland PMRF Survey Area Vegetation Communities

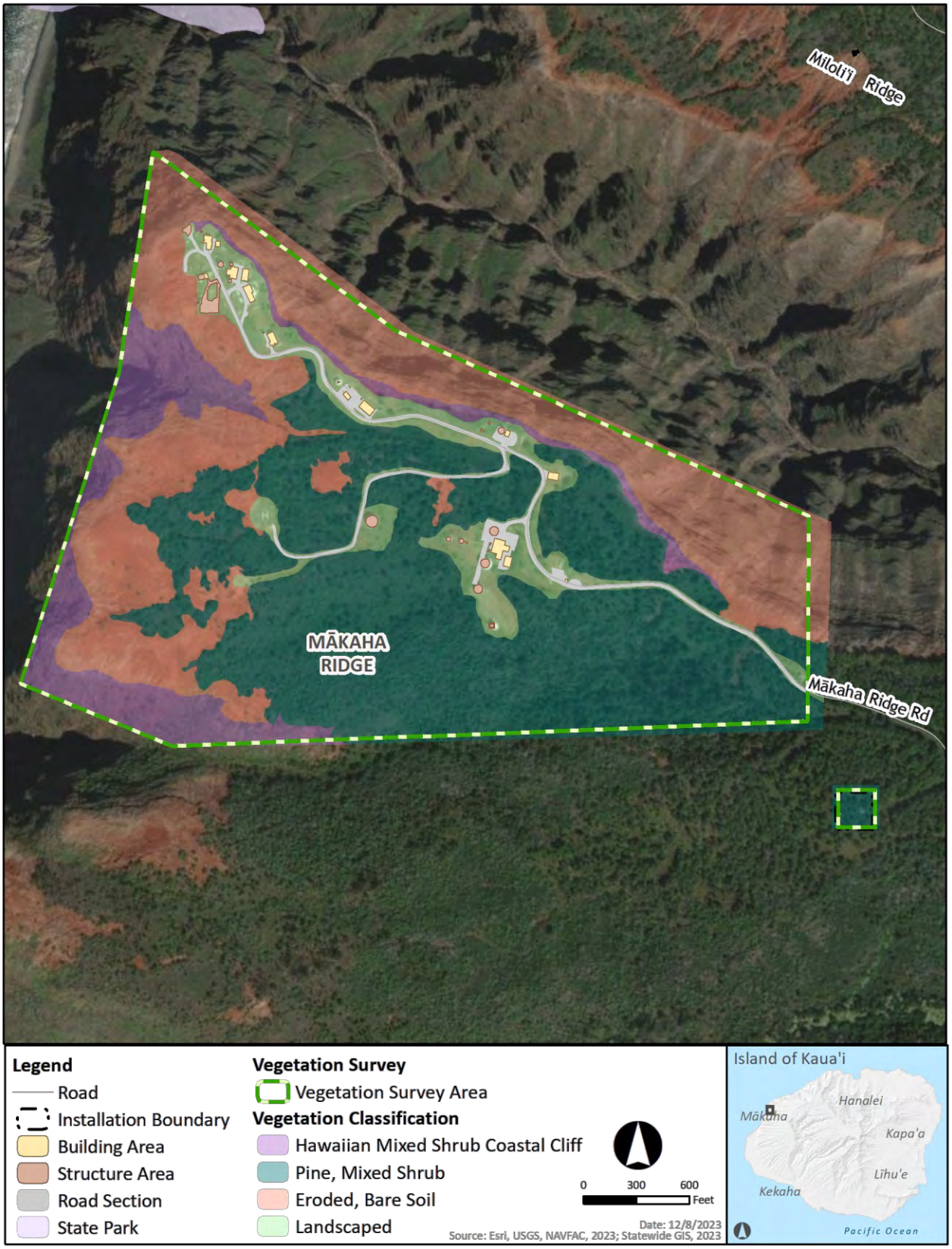

Figure 4-3 Mākaha Ridge Survey Area Vegetation Communities

Table 4-2 Vegetation and Land Cover in the Coastal Survey Area

Vegetation and Land Cover Type	*Acres*
Kiawe	14.7
Kiawe-koa haole scrub	62.3
Pōhinahina-naupaka dune	16.5
Agricultural	14.0
Wetland vegetation with koa haole	2.3
Dunes[1]	13.3
Roadways	1.9
Total	**125.0**

Note: [1]Dunes devoid of vegetation.

Table 4-3 Vegetation and Land Cover in the Mākaha Ridge Survey Area

Vegetation and Land Cover Type	*Acres*
Pine, mixed shrub	97.2
Hawaiian mixed shrub coastal cliff	23.0
Landscaped	23.8
Eroded, bare soil	64.2
Total	**208.2**

Eleven vegetation and land cover types were documented in the survey area: kiawe; kiawe-koa haole scrub; pōhinahina-naupaka dune; agricultural; wetland vegetation with koa haole; dunes; roadways; pine, mixed shrub; Hawaiian mixed shrub coastal cliff; landscaped; and eroded, bare soil. Descriptions of the pertinent vegetation and land cover types and their characteristic species are provided in Sections 4.2.1 and 4.2.2. Plant community descriptions are based on those provided in the 2023 Draft INRMP (NAVFAC Pacific, 2023c), and updated per the in-field observations made by surveyors. A list of all plant species encountered is included in Appendix B.

4.2.1 Coastal and Inland PMRF Survey Areas

The following vegetation communities and land cover types were documented in the coastal survey area (Figure 4-2).

4.2.1.1 Kiawe

Kiawe (*Prosipis pallida*)-dominated forest is present just inland of the native dune ecosystems and stretches along the entire PMRF coastline. Much of the kiawe thickets, which are found in monotypic patches, contain little to no understory vegetation, due to the thick, sprawling, and shading habit of the kiawe trees. This vegetation type grows on soils as well as sand and is dominant in the inland dunes.

4.2.1.2 Kiawe and Koa Haole

Kiawe and koa haole are the most abundant and dominant canopy species in the dry, disturbed, lowland habitats of coastal PMRF and peripheral areas. They are found in about equal numbers throughout the base. The tallest and densest area of this vegetation type occurs behind the Nohili Point sand dunes between Nohili Road and the agricultural fields in the northern portion of the base. Non-native guinea grass (*Megathyrsus maximus*) is also abundant and grows 2 to 3 feet (0.6 to 1 meters) tall in this area. Much of the kiawe/koa haole-dominated vegetation contained little understory vegetation, due to the dense cover and lack of sunlight underneath the canopy. However, lantana shrubs form dense 5 to 7 feet (1.5 to 2 meters) thickets between the trees, and ‘ali‘i (*Dononaea viscosa*) patches are abundant among the thick kiawe/koa haole canopy. Other abundant groundcover plants include ‘ilie‘e (*Plumbago zeylanica*), lion’s ear (*Leonotis nepitifolia*), golden crownbeard (*Verbesina encelioides*), dodder (*Cassytha filiformis*), and tall comb hyptis (*Hyptis pectina*).

4.2.1.3 Pōhinahina-Naupaka Dune

The seaward facing slopes of the large dunes at Nohili Point contain mostly native coastal dune vegetation, which is dominated by pōhinahina (*Vitex rotundifolia*) and naupaka (*Scaevola taccada*). Low mats of pōhinahina form over the dunes interspersed with low thickets of naupaka. ʻAkoko (*Euphorbia celastroides*) is also locally abundant in the area of the launch pads and individuals also exist intermittently along the dunes. ʻAkiʻaki grass (*Sporobolus virginicus*), beach morning glory (*Ipomoea pes-caprae*), and hunakai (*Ipomoea imperati*) are also widespread and abundant in this habitat. Inland of the pōhinahina-naupaka dune vegetation is dense kiawe-koa haole scrub, and some kiawe and koa haole scrub are scattered throughout the native dune vegetation.

4.2.1.4 Agricultural

The agricultural area is located in between the dirt road and the irrigation ditch. This area contains mostly koa haole canopy with understory thickets of lantana and guinea grass. Other abundant vegetation in this area is sourbush (*Pluchea carolinensis*), and java plum (*Syzigium cummini*). There are a number of native species, including aʻaliʻi (*Dodonaea viscosa*) and ʻilima (*Sida falax*), that mostly exist in sandy/sunny openings in the canopy.

4.2.1.5 Wetland Vegetation with Koa Haole

This community was found along the edge of a drainage in the survey area. Non-native vegetation such as shoreline sea purslane (*Sesuvium portulacastrum*) and *Pluchea* spp. border the outskirts of this elongated "wetland" area. Atop the berm of the "wetland" are non-native canopy species including koa haole and kiawe trees. The drainage eventually leads to the ocean at Barking Sands.

4.2.2 Mākaha Ridge Survey Area

The following vegetation communities and land cover types were documented at Mākaha Ridge Survey Area (Figure 4-3).

4.2.2.1 Pine, Mixed Shrub

Non-native pine canopy and mixed understory scrub vegetation typically includes slash pine (*Pinus elliottii*), lantana shrubs, eucalyptus (*Eucalyptus* spp.), and silk oak (*Grevillea robusta*) trees. Portions of these areas either contain grasses such as guinea grass, tufted beardgrass (*Schizachyrium condensatum*), or bushy bluestem (*Andropogon glomeratus*), or contain exposed soil with unanchored small and large boulders that have been highly disturbed by goats. This forested vegetation type includes a significant amount of native canopy and native understory plant life, including large patches of koa (*Acacia koa*), alaheʻe (*Psydrax odorata*), aʻaliʻi, and pūkiawe (*Leptecophylla tameiameiae*), which dominates the vegetation in some of these upland forested Mākaha Ridge Survey Areas.

4.2.2.2 Landscaped Vegetation

Other than in the immediate vicinity of buildings and recent landscape improvements, very little of the survey area is landscaped. Most of the landscaped area vegetation is Bermuda grass (*Cynodon dactylon*), which has been planted and maintained. Plantings of red hibiscus (*Hibiscus* sp.), aloe (*Aloe* sp.), guava (*Psidium guajava*), and mango (*Mangifera indica*) were present and maintained near buildings. It should also be noted that around the buildings and maintained areas, invasive weeds were present, and this is possibly due to the introduction of these weeds from heavy equipment, earth moving, and/or human foot traffic.

4.2.2.3 Hawaiian Mixed Shrub Coastal Cliff

Cliff vegetation is primarily composed of native mixed shrub species and sparsely vegetated/bare dirt areas. A small percentage of the cliff vegetation contains non-native vegetation as well. Most of the vegetation is either on severely eroded ridgetop or scattered in small patches along the cliff face, ledges, or long, narrow terraces. Low-growing (2 to 4 feet [0.6 to 1 meter]) shrubs of naio (*Myoporum sandwicense*) are the most abundant plant species populating the cliff zones, along with tufted beardgrass (*Schizachryrium condensatum*).

The dry cliff community faces several threats. One threat is habitat degradation by feral goats. Several state and federally listed plants are found on dry cliff communities as these extreme slopes provide protection from feral goats. The other threats are competition with non-native plants and reduced reproductive vigor of rare species due to the limited number of remaining individuals.

4.2.2.4 Eroded, Bare Soil

Ruderal vegetation occurs in the disturbed and unmaintained areas. Various grasses and weedy, often annual herbaceous species, compose the majority of this vegetation type. Large, barren, eroded sites are located along and adjacent to the oceanside fence line and adjacent to most of the buildings and other facilities. The majority of the vegetation in these areas is low-growing naio, non-native grasses, and lantana. Plant restoration work is occurring on a few oceanside/bare ground areas to prevent erosion. These areas appear to be recently planted with vetiver grass (*Chrysopogon zizanioides*).

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CHAPTER 5
DISCUSSION

This section provides details on the special status species observed and mapped during the terrestrial surveys. Specific coordinates of all mapped points for species locations were provided to the Navy via a GIS package.

5.1 *PANICUM NIIHAUENSE*

Panicum niihauense (lau‘ehu) is a federally endangered short-lived perennial bunchgrass in the Poaceae that currently only occurs on Kaua‘i, but was also known historically from Ni‘ihau. It is known to occur in dry coastal habitats in calcareous sand dunes and rocky knolls (Appendix A, Photo 2). Threats to the species include invasive plant species (koa haole and kiawe), loss of habitat from climate change, and off-road vehicles.

The portion of the survey area along the coast overlaps with known critical habitat for this species. Occupied habitat included sand dunes with rocky knolls, and vegetation was dominated by kiawe and koa haole, with naupaka and buffelgrass also present. The survey located four individuals located in two adjacent locations in an area with multiple outplanting tags for ‘ohai and *Panicum niihauense*. All four individuals located during the survey had been previously tagged and were found in groups of two. One group, located in a slightly more open area adjacent to koa haole and buffelgrass, included one mature senesced individual with flowers (Appendix A, Photos 22 and 23) and one mature living individual with flowers (Appendix A, Photo 23). The second group was located approximately 15 feet from the first location in a more densely vegetated area, adjacent to the edge of a kiawe patch with koa haole, and included two immature living individuals with no flowers (Appendix A, Photos 25 and 26).

As described in the USFWS’s last 5-year review for *Panicum niihauense* prepared in 2015, the total population included six individuals known to occur in the wild and 17 outplanted individuals (USFWS, 2015). There are currently 19 different collections of *Panicum niihauense* from Polihale in the National Tropical Botanical Garden’s seed bank, additional seeds are at the Lyon Arboretum, and several plants are cultivated in gardens and nurseries. The review describes outplantings within a fenced exclosure at Nualolo Kai in 2013, 11 individuals outplanted in 2014, and over 300 plants have been planted at Lawai Kai.

Navy Region Hawaii’s 2010 INRMP provides management actions and goals for protecting *Panicum niihauense* habitat within PMRF. The Navy monitors the area and has restrictions on use, directing personnel to avoid sensitive dune vegetation. Planned projects (depending on funding) include invasive plant control and removal (kiawe), buffelgrass, and koa haole. PMRF is in the planning stages of establishing a plant nursery to propagate native plants for landscaping and habitat restoration.

5.2 INVASIVE SPECIES

Invasive species are identified as such in Appendix B. Invasive plants dominate the two areas surveyed, as is well documented in the 2010 INRMP and 2023 Draft INRMP. Lantana forms dense thickets at Mākaha Ridge, outcompeting the native understory species. Additionally, the kiawe-koa haole scrub varies from dense forests along the inland portion of the coastal survey area and low, windswept thickets along the oceanfront. Of note, golden crownbeard was located at the Polihale survey area and is considered extremely invasive and detrimental to native habitats and may warrant special attention for management.

5.3 SURVEY NOTES AND RECOMMENDATIONS

Large, rusted barbed wire piles under dead kiawe were located along with infrastructure debris (including concrete slabs and asphalt) (Appendix A, Photos 6 and 7).

An ancestral Hawaiian site marked as "Wahi kupuna" with burial sites was located approximately 0.25 mile southwest of the monkeypod tree that marks a turn from the main Polihale Road to a side road that runs from the edge of the State land to Main Base.

To minimize impacts to *Panicum niihauense* and ʻohai critical habitat at Polihale, the Navy should continue to implement INRMP management actions and goals.

CHAPTER 6
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Appendix A
Survey Photographic Record

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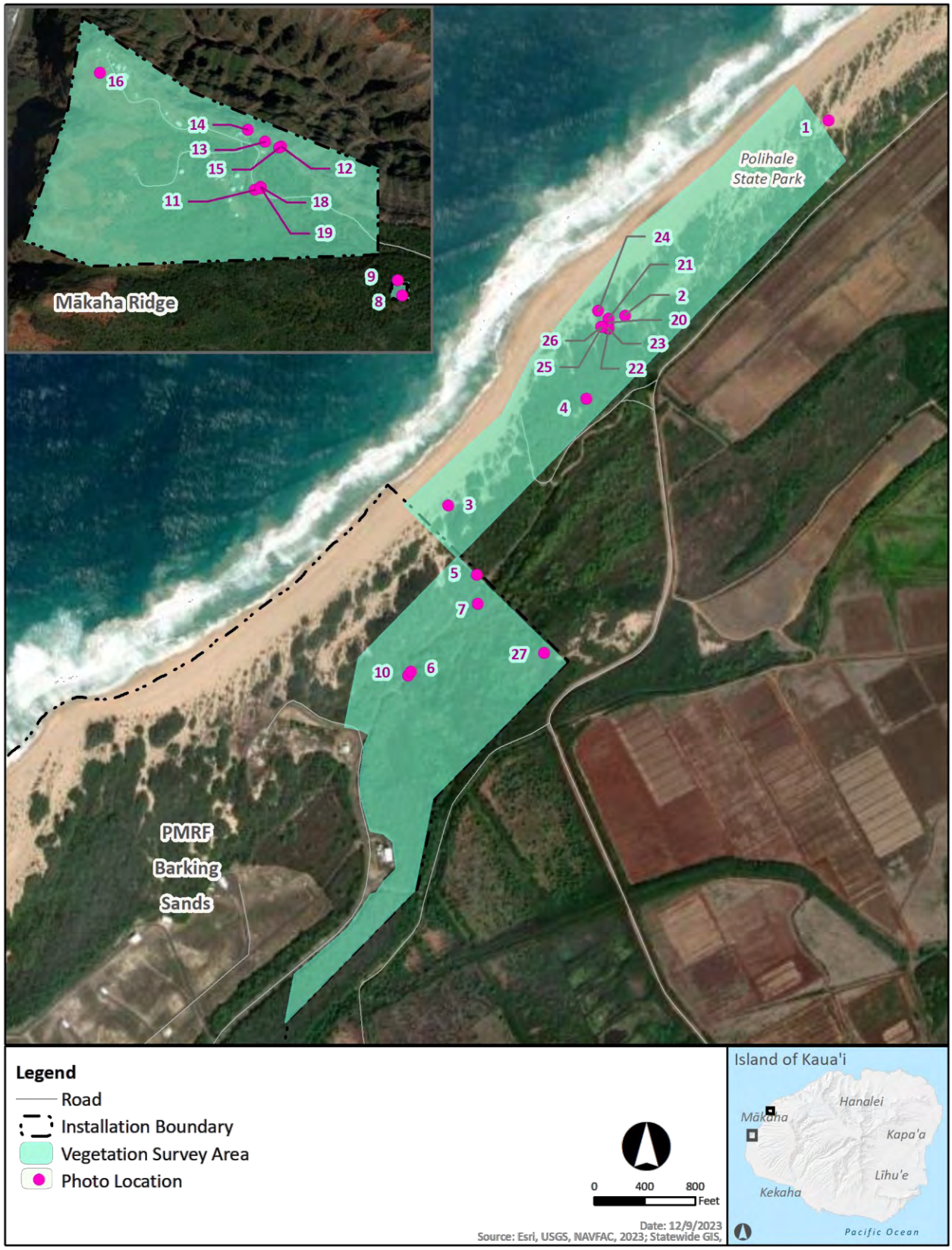

Figure A. Photograph Locations

Photo 1. Sand dunes with mixed vegetation of koa haole (*Leucaena leucocephala)*, pōhinahina (*Vitex rotundifolia*), and naio (*Myoporum sandwicense*) on Barking Sands Beach. The ocean is located behind the sand dune.

Photo 2. Sand dunes at Barking Sands Beach. Sparse patches of beach naupaka (*Scaevola taccada*) and pōhinahina in front of dense kiawe thickets.

Photo 3. Low mats of pōhinahina draped over sand dunes at Barking Sands Beach.

Photo 4. Kiawe (*Prosopis pallida*) scrub forest consisting of large dead branches of kiawe, living kiawe trees, and dead grassy understory at Barking Sands.

Photo 5. Sparsely populated kiawe-koa haole scrub in dry forested area near Barking Sands.

Photo 6. Piles of old infrastructure debris, consisting of concrete slabs, discovered in kiawe-koa haole forest near Barking Sands.

Photo 7. Rusted barbed wire piles under dead kiawe vegetation at Barking Sands.

Photo 8. Pine tree (*Pinus elliottii*) overstory with lantana and grassy understory at Mākaha Ridge.

Photo 9. Pine tree canopy towering over mixed shrub understory at Mākaha Ridge.

Photo 10. Roadway at Barking Sands alongside dry kiawe-koa haole scrubland.

Photo 11. Roadway shaded by tall pine trees at Mākaha Ridge.

Photo 12. Mixed shrub coastal cliff vegetation at Mākaha Ridge.

Photo 13. Mixed shrub coastal cliff vegetation consisting of naio at Mākaha Ridge.

Photo 14. Safety fenceline on Mākaha Ridge with mixed shrub vegetation.

Photo 15. Eroded, bare soil atop Mākaha Ridge.

Photo 16. Plantings associated with erosion control, consisting of grassy clumps on eroded, bare soil at Mākaha Ridge.

Photo 17. "Wetland" vegetation community along drainage with koa haole, *Pluchea* sp., and other mixed non-native scrub at Barking Sands.

Photo 18. Landscaped red hibiscus (*Hibiscus* sp.) bushes alongside roadside at Mākaha Ridge.

Photo 19. Landscaped foxtail agave (*Agave attenuata*) plants along roadside at Mākaha Ridge.

Photo 20. One ‘ohai (*Sesbania tomentosa*) outplanting tag found at Barking Sands. Living ‘ohai plants were not observed.

Photo 21. Several ‘ohai outplanting tags found at Barking Sands. Living ‘ohai plants were not observed.

Photo 22. Close-up of mature senesced lau‘ehu (*Panicum niihauense*) plant with plant tag discovered in sand dunes at Barking Sands.

Photo 23. Mature senesced lau‘ehu (*Panicum niihauense*) plant in sand dunes at Barking Sands.

Photo 24. Mature lau‘ehu plant discovered in sand dunes at Barking Sands.

Photo 25. Immature lau‘ehu plant discovered next to another immature lau‘ehu in sand dunes at Barking Sands.

Photo 26. Immature lau‘ehu plant discovered next to another immature lau‘ehu in sand dunes at Barking Sands.

Photo 27. Agricultural area with dead grassy understory and sparsely populated koa haole canopy.

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Appendix B
Complete List of Plant Species Observations

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Family	***Scientific Name***	***Common Name***	***Hawaiian Name***	***Location***	***Origin/Status***	***Vegetation Type***
Malvaceae	*Abutilon grandifolium*	Hairy abutilon	mao	Barking Sands	Intro	K,R
Amaranthaceae	*Amaranthus spinosus*	Spiny amaranth	pakai kuku	Barking Sands	Intro	R
Poaceae	*Andropogon virginicus**	Broomsedge		Barking Sands	Intro	BG
Apocynaceae	*Asclepias physocarpa**	Balloon plant		Barking Sands	Intro	K
Acanthaceae	*Barleria cristata*	Philippine violet		Barking Sands	Intro	
Lauraceae	*Cassytha filiformis*	Dodder	kauna‘oa pehu	Barking Sands	Intro	K,PND,S
Poaceae	*Cenchrus ciliaris*	Buffelgrass		Barking Sands	Intro	
Poaceae	*Chloris barbata*	Swollen fingergrass	mau‘u lei	Barking Sands	Intro	K, KH
Cyperaceae	*Cyperus alternifolius**	Umbrella papyrus	‘ahu‘awa haole	Barking Sands	Intro	K, KH
Sapindaceae	*Dodonaea viscosa*		a`ali`i	Barking Sands	Intro	K,A,PND,S,D
Euphorbiaceae	*Euphorbia celastroides*		‘akoko	Barking Sands	End	PND
Boraginaceae	*Heliotropium procumbens var. depressum*	Fourspike heliotrope		Barking Sands	Intro	R
Lamiaceae	*Hyptis pectinata*	Comb hyptis		Barking Sands	Intro	D,R
Fabaceae	*Indigofera suffruticosa*	Indigo	‘inikō	Barking Sands	Intro	
Convolvulaceae	*Ipomoea pes-caprae*	Beach morning glory	pohuehue	Barking Sands	Ind	PND,S,R
Verbenaceae	*Lantana camara*	Lantana	lākana	Barking Sands	Intro	K,A,R
Lamiaceae	*Leonotis nepetifolia*	Lion's ear		Barking Sands	Intro	K,A,R
Fabaceae	*Leucaena leucocephala*		koa haole	Barking Sands	Intro	
Poaceae	*Megathyrsus maximus*	Guinea grass		Barking Sands	Intro	K, KH
Poaceae	*Melinis minutiflora*	Molasses grass		Barking Sands	Intro	K, KH
Cucurbitaceae	*Momordica charantia*	Bitter melon		Barking Sands	Intro	K,A
Fabaceae	*Prosopis pallida*		kiawe	Barking Sands	Intro	K, PND
Poaceae	*Panicum niihauense*	Niihau panicgrass	lau'ehu	Barking Sands	FE, SE	S
Poaceae	*Paspalum conjugatum*	Hilo grass	mau'u hilo	Barking Sands	Intro	K, KH
Arecaceae	*Phoenix sp.*	Date plam		Barking Sands	Intro	K,S
Asteraceae	*Pluchea carolinensis*	Sourbush		Barking Sands	Intro	K,PND,D,R
Asteraceae	*Pluchea fosbergii*	Pluchea hybrid		Barking Sands	Intro	R
Asteraceae	*Pluchea indica*	Indian fleabane		Barking Sands	Intro	K,A,S,D,R
Plumbaginaceae	*Plumbago zeylanica**		‘ilie'e	Barking Sands	Ind	
Euphorbiaceae	*Ricinus communis*	Castor bean		Barking Sands	Intro	K,R
Petiveriaceae	*Rivina humilis*	Coral berry		Barking Sands	Intro	K
Aizoaceae	*Sesuvium portulacastrum*	Shoreline seapurslane		Barking Sands	Intro	
Goodneiaceae	*Scaevola taccada*		beach naupaka, naupaka kahakai	Barking Sands	Ind	A,PND,S,D,R
Anacardiaceae	*Schinus terebinthifolius*	Christmas berry		Barking Sands	Intro, Inv	A
Pinaceae	*Setaria verticillata*	Bristly foxtail	mau'u pilipili	Barking Sands	Intro	

Family	***Scientific Name***	***Common Name***	***Hawaiian Name***	***Location***	***Origin/Status***	***Vegetation Type***
Malvaceae	*Sida rhombifolia*	Sida, Cuban jute		Barking Sands	Intro	R
Solanaceae	*Solanum americanum*	Glossy nightshade	popolo	Barking Sands	Ind	K,A
Asteraceae	*Sonchus oleraceus*	Sow thistle	pualele	Barking Sands	Intro	A,PND,S,R
Poaceae	*Sporobolus virginicus*	Beach dropseed	‘aki‘aki	Barking Sands	Ind	
Verbenaceae	*Stachytarpheta jamaicensis*	Jamaican vervian	ōwī	Barking Sands	Intro	D,R
Myrtaceae	*Syzygium cumini*	Java plum		Barking Sands	Intro	D,R
Malvaceae	*Triumfetta semitriloba**	Sacramento bur		Barking Sands	Intro	
Asteraceae	*Verbesina encelioides*	Golden crownbeard		Barking Sands	Intro, Inv	K,A,PND,S,D,R
Lamiaceae	*Vitex rotundifolia*	Beach vitex	pōhinahina	Barking Sands	Ind	A,PND,S
Sterculiaceae	*Waltheria indica*		uhaloa	Barking Sands	Ind	K,A,PND,S,R
Fabaceae	*Acacia confusa*	Formosa koa		Mākaha Ridge	Ind	
Fabaceae	*Acacia koa*		koa	Mākaha Ridge	End	PPMS
Pteridaceae	*Adiantum hispidulum*	Five-finger maiden hair		Mākaha Ridge	Intro	
Agavaceae	*Agave attenuata**	Agave		Mākaha Ridge	Intro	
Asteraceae	*Ageratina riparia*	Spreading mist flower	hāmākua pāmakani	Mākaha Ridge	Intro	
Asphodeaceae	*Aloe sp.**	Aloe		Mākaha Ridge	Intro	
Poaceae	*Andropogon glomeratus*	Bushy bluestem		Mākaha Ridge	Intro	
Araucariaceae	*Araucaria columnaris**	Cook pine		Mākaha Ridge	Intro	
Blechnaceae	*Blechnum appendiculatum*	Palm fern		Mākaha Ridge	Intro	C
Fabaceae	*Canavalia hawaiiensis**		‘āwikiwiki	Mākaha Ridge	End	
Cyperaceae	*Carex wahuensis*	O'ahu sedge		Mākaha Ridge	End	PPMS
Fabaceae	*Chamaecrista nictitans var. glabrata*	Partridge pea	laukī	Mākaha Ridge	Intro	PPMS,R, C
Thelypteridaceae	*Cyclosorus parasiticus*	Parasitic maiden fern		Mākaha Ridge	Intro	C
Poaceae	*Chrysopogon zizanioides**	Vetiver grass		Mākaha Ridge	Intro	
Asteraceae	*Cirsium vulgare*	Bull thistle	pua kala	Mākaha Ridge	Intro	C,PPMS,R
Menispermaceae	*Cocculus orbiculatus*		huehue, hue	Mākaha Ridge	Ind	PPMS
Asteraceae	*Conyza bonariensis*	Hairy horseweed	lani wela	Mākaha Ridge	Intro	C,R
Apiaceae	*Cyclospermum leptophyllum**	Fir-leaved celery		Mākaha Ridge	Intro	
Poaceae	*Cynodon dactylon*	Bermuda grass	mānienie	Mākaha Ridge	Intro	R
Fabaceae	*Desmanthus pernambucanus*	Slender mimosa		Mākaha Ridge	Intro	C
Fabaceae	*Desmodium incanum*	Spanish clover	ka‘imi	Mākaha Ridge	Intro	PPMS,R
Liliaceae	*Dianella sandwicensis*		‘uki‘uki, ‘uki	Mākaha Ridge	Ind	PPMS
Sapindaceae	*Dodonaea viscosa*		a`ali`i	Mākaha Ridge	Intro	C,PPMS,R
Amaranthaceae	*Dysphania pumilo**	Clammy goosefoot		Mākaha Ridge	Intro	
Asteraceae	*Elephantopus mollis**	Elephant's foot		Mākaha Ridge	Intro	

Family	***Scientific Name***	***Common Name***	***Hawaiian Name***	***Location***	***Origin/Status***	***Vegetation Type***
Asteraceae	*Emilia sonchifolia* var. javanica	Lilac tasselflower		Mākaha Ridge	Intro	R
Asteraceae	*Erigeron karvinskianus*	Daisy fleabane		Mākaha Ridge	Intro	R
Myrtaceae	*Eucalyptus* spp.	Eucalyptus		Mākaha Ridge	Intro	PPMS
Euphorbiaceae	*Euphorbia hirta*	Hairy spurge, Garden spurge	koko kahiki	Mākaha Ridge	Intro	C
Proteaceae	*Grevillea robusta*	Silky oak		Mākaha Ridge	Intro	C,PPMS
Malvaceae	*Hibiscus sp.**	Red hibiscus			Intro	L
Lamiaceae	*Hyptis pectinata**	Comb hyptis			Intro	
Fabaceae	*Indigofera suffruticosa*	Upright indigo	inikō	Mākaha Ridge	Intro	C,R
Crassulaceae	*Kalanchoe pinnata**	Air plant		Mākaha Ridge	Intro	
Verbenaceae	*Lantana camara*	Lantana	lākana	Mākaha Ridge	Intro	C,PPMS,R
Epacridaceae	*Leptecophylla tameiameiae*		pūkiawe, ‘a‘ali‘i mahu	Mākaha Ridge	Ind	C
Fabaceae	*Leucaena leucocephala*	Lead tree, False koa	koa haole	Mākaha Ridge	Intro	R
Malvaceae	*Malvastrum coromandelianum**	False mallow		Mākaha Ridge	Inro	
Anacardiaceae	*Mangifera indica* *	Mango	manako, meneke	Mākaha Ridge	Intro	
Poaceae	*Megathyrsus maximus*	Guinea grass		Mākaha Ridge	Intro, Inv	C
Meliaceae	*Melia azedarach*	Chinaberry		Mākaha Ridge	Intro	PPMS
Poaceae	*Melinis minutiflora*	Molasses grass		Mākaha Ridge	Intro	C,PPMS,R
Poaceae	*Melinis repens*	Natal redtop		Mākaha Ridge	Intro	C,PPMS,R
Fabaceae	*Mimosa pudica var. unijuga*	Sensitive plant, Sleeping grass	pua hilahila	Mākaha Ridge	Intro	R
Cucurbitaceae	*Momordica charantia*	Bitter melon		Mākaha Ridge	Intro	C
Myricaceae	*Morella faya**	Fire tree		Mākaha Ridge	Intro, Inv	
Myoporaceae	*Myoporum sandwicense*	Bastard or false sandalwood	naio	Mākaha Ridge	End	C,PPMS
Nephrolepidaceae	*Nephrolepis brownii*	Hairy swordfern		Mākaha Ridge	Intro	PPMS
Oleaceae	*Olea europaea*	Olive, African olive	‘oliwa	Mākaha Ridge	Intro	PPMS, C
Poaceae	*Oplismenus hirtellus*	Basketgrass, Bamboo grass	honohono kukui	Mākaha Ridge	Intro	PPMS
Cactaceae	*Opuntia ficus-indica*	Prickly pear cactus	pānini, pāpipi	Mākaha Ridge	Intro	C
Oxalidaceae	*Oxalis corniculata*	Yellow wood sorrel	‘ihi ‘ai, ‘ihi ‘awa	Mākaha Ridge	Intro	C,PPMS,R
Oxalidaceae	*Oxalis debilis*	Pink wood sorrel	‘ihi pehu	Mākaha Ridge	Intro	C
Asteraceae	*Parthenium hysterophorus**	False ragweed, Santa Maria		Mākaha Ridge	Intro	

Family	***Scientific Name***	***Common Name***	***Hawaiian Name***	***Location***	***Origin/Status***	***Vegetation Type***
Lauraceae	*Persea amaericana**	Avocado		Mākaha Ridge	Intro	
Arecaceae	*Phoenix sp.*	Date palm		Mākaha Ridge	Intro	C
Pinaceae	*Pinus elliottii*	Slash pine		Mākaha Ridge	Intro	C
Pteridaceae	*Pityrogramma austroamericana**	Gold dust fern		Mākaha Ridge	Intro	
Plantaginaceae	*Plantago lanceolata*	Narrow-leaved plantain		Mākaha Ridge	Intro	C
Plantaginaceae	*Plantago major*	Broad-leaved plantain	laukahi	Mākaha Ridge	Intro	C,R
Asteraceae	*Pluchea carolinensis*	Sourbush		Mākaha Ridge	Intro	R
Plumbaginaceae	*Plumbago auriculata**	Cape plumbago, Leadwort		Mākaha Ridge	Intro	
Polygalaceae	*Polygala paniculata**	Milkwort, Rootbeer plant		Mākaha Ridge	Intro	
Myrtaceae	*Psidium cattleianum*	Strawberry guava	waiawi ‘ula‘ula	Mākaha Ridge	Intro, Inv	PPMS
Myrtaceae	*Psidium cattleianum* var. *littorale*	Strawberry guava	waiawi	Mākaha Ridge	Intro, Inv	PPMS
Myrtaceae	*Psidium guajava*	Common guava	kuawa, kuawa ke‘oke‘o	Mākaha Ridge	Intro	PPMS
Rubiaceae	*Psydrax odorata*		alahe‘e, ‘he‘e, walahe‘e	Mākaha Ridge	Ind	C,PPMS
Euphorbiaceae	*Ricinus communis*	Castor bean		Mākaha Ridge	Intro	R
Lamiaceae	*Salvia rosmarinus**	Rosemary		Mākaha Ridge	Intro	
Goodeniaceae	*Scaevola gaudichaudii*	Ridgetop naupaka	naupaka kuahiwi	Mākaha Ridge	End	PPMS
Poaceae	*Schizachyrium condensatum*	Tufted beardgrass, Little bluestem		Mākaha Ridge	Intro	C,PPMS
Poaceae	*Setaria parviflora*	yellow foxtail	mau‘u kaleponi	Mākaha Ridge	Intro	PPMS,R,C
Malvaceae	*Sida fallax*		‘ilima	Mākaha Ridge	Ind	PPMS
Malvaceae	*Sida spinosa**	Prickly sida		Mākaha Ridge	Intro	
Solanaceae	*Solanum americanum*	Glossy nightshade	popolo	Mākaha Ridge	Ind	R
Asteraceae	*Sonchus oleraceus*	Sow thistle	pualele	Mākaha Ridge	Intro	C
Rubiaceae	*Spermacoce assurgens*	Buttonweed		Mākaha Ridge	Intro	R
Asteraceae	*Sphagneticola trilobata*	Wedelia		Mākaha Ridge	Intro	PPMS,R
Poaceae	*Sporobolus indicus*	Smutgrass		Mākaha Ridge	Intro	R, C
Verbenaceae	*Stachytarpheta jamaicensis*	Jamaican vervian	ōwī, oi	Mākaha Ridge	Intro	D,R
Myrtaceae	*Syzygium cumini*	Java plum		Mākaha Ridge	Intro	C

Family	***Scientific Name***	***Common Name***	***Hawaiian Name***	***Location***	***Origin/Status***	***Vegetation Type***
Tiliaceae	*Triumfetta semitriloba**	Sacramento bur		Mākaha Ridge	End	
Sterculiaceae	*Waltheria indica*		uhaloa	Mākaha Ridge	Ind	C,PPMS,R

Key for species:
* new species observation record.

Key for origin/status:
End=Endemic; FE=Federally Endangered; Intro=Introduced; Ind=Indigenous; Inv=Invasive; SE=State Endangered

Key for vegetation type:
K= Kiawe-Koa Haole Scrub; A= A`ali`i Scrub; PND= Pōhinahina-Naupaka Dune; S= Strand; D= Drainage/Wetlands; C= cliff; PPMS= Planted Pine/Mixed shrub; R=Ruderal

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Hawaii Ecosystems at Risk, Pacific Island Ecosystems at Risk, Hawaiian Ecosystems at Risk project (HEAR)

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PMRF Fauna Survey Report

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Final

Terrestrial Fauna Survey Report at Pacific Missile Range Facility in Support of Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Kauaʻi, Hawaiʻi

Prepared for:

Department of the Navy
Naval Facilities Engineering Systems Command, Pacific
258 Makalapa Drive, Suite 100
Joint Base Pearl Harbor-Hickam, HI 96860-3134

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Final

Terrestrial Fauna Survey Report at Pacific Missile Range Facility in Support of Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement Kauaʻi, Hawaiʻi

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ACRONYMS AND ABBREVIATIONS

DLNR	Department of Land and Natural Resources
DON	Department of the Navy
EIS	Environmental Impact Statement
ESA	Endangered Species Act
GIS	geographic information system
GPS	global positioning system
KPGO	Kōkeʻe Park Geophysical Observatory
MBTA	Migratory Bird Treaty Act
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Systems Command
Navy	United States Department of the Navy
PMRF	Pacific Missile Range Facility
SOW	Statement of Work
U.S.	United States

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

This report details the results of two surveys for terrestrial wildlife species at Pacific Missile Range Facility (PMRF) in support of the proposed PMRF and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). The United States (U.S.) Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA), in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR), are preparing an EIS which evaluates the potential environmental consequences of the Navy's and NASA's proposal to retain the use of approximately 8,348 acres and 23 acres, respectively, in support of the Navy's continued and ongoing operational continuity and sustainment at PMRF and NASA's continued operations at KPGO. The Navy's 8,348 acres are a part of the larger PMRF installation which includes the entire instrumented range on land and ocean areas that support surface, subsurface, air, and space operations.

Between 1964 and 2007, the Navy and NASA began leasing property from the DLNR-owned land primarily for passive encroachment buffer as well as for mission operations, access, and utilities at the following five general locations: Main Base (also referred to as Barking Sands), Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge. The easement areas provide safety buffer zones for training and testing missions and prevent incompatible development. The existing Navy and NASA real estate agreements with the DLNR are set to expire between 2027 and 2030.

Under the direction of Naval Facilities Engineering Systems Command (NAVFAC), and in accordance with the 19 July 2022 Statement of Work (SOW) for Task Order N6274222F0206, Stantec GS Inc. ("Stantec") performed terrestrial fauna surveys within identified survey area components of the PMRF and KPGO real estate study area in Kauaʻi, Hawaiʻi (Figure 1-1). Survey results will be used for future project planning; development of potential avoidance and minimization measures; National Environmental Policy Act analysis; Chapter 343, Hawaiʻi Revised Statutes (commonly referred to as HEPA) and Hawaiʻi Administrative Rules Section 11.200-1 analysis; and/or potential Endangered Species Act (ESA) section 7 consultation.

A work plan and desktop analysis were prepared in August 2023 to inform what terrestrial resources may exist in the survey area, and also outlined the proposed methodology, data management, reporting, scheduling, and personnel roles during the prescribed fieldwork (NAVFAC Pacific, 2023). This field report summarizes the terrestrial fauna surveys that occurred in October 2023 and April 2024.

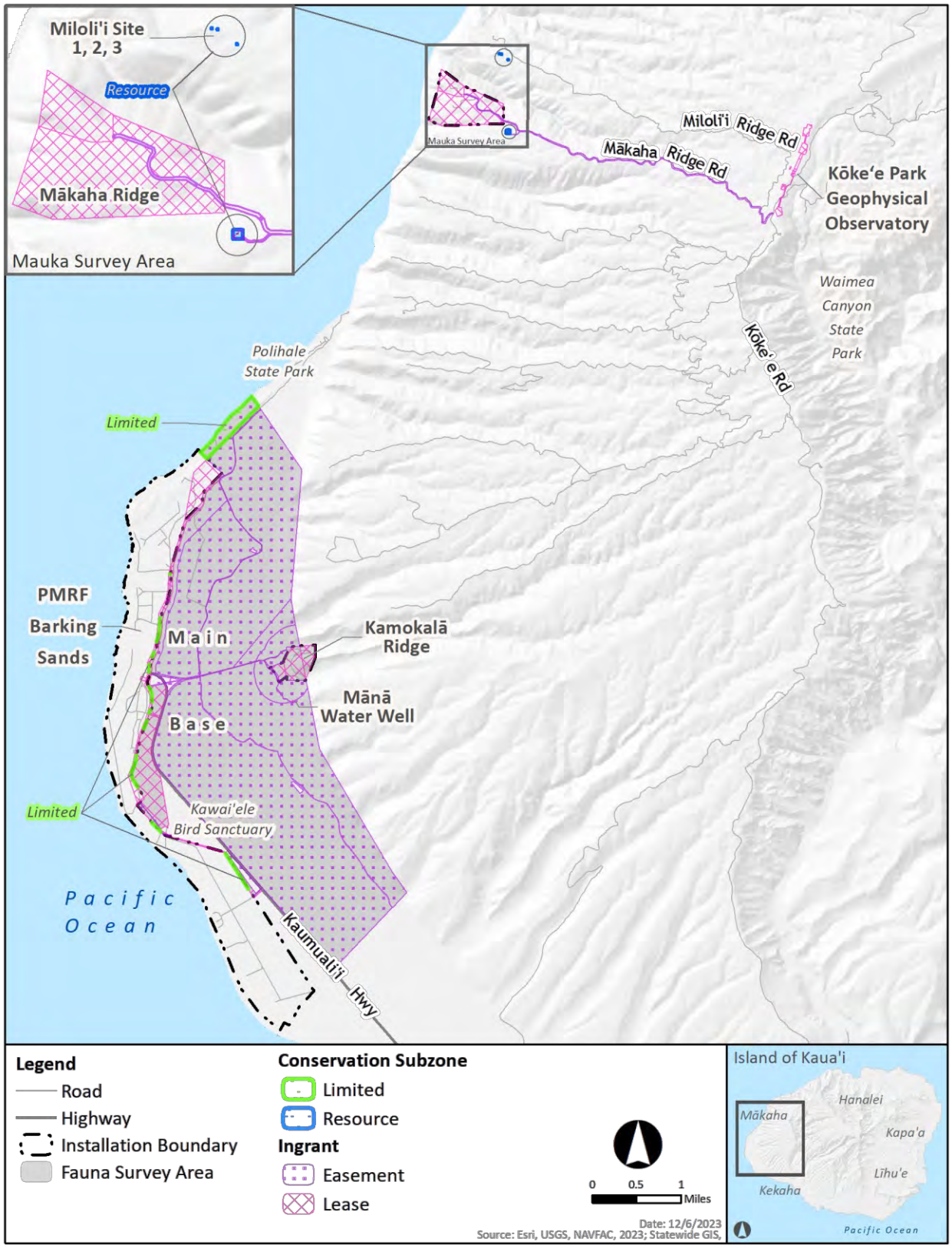

Figure 1-1 PMRF Fauna Survey Area Location Map

1.2 PURPOSE AND OBJECTIVE OF THE SURVEY

The purpose of the terrestrial fauna surveys was to document wildlife presence within the terrestrial survey area at PMRF (see Figure 1-1), as well as document the general suitability of habitat for wildlife within the survey area. Primary species of concern during the surveys included special status wildlife species (federally or state-listed species), bird species protected under the Migratory Bird Treaty Act (MBTA), and invasive and/or pest species. The primary objective of the terrestrial fauna surveys was to identify what terrestrial fauna resources exist within the survey area to support any environmental evaluations and consultations potentially required by laws, regulations, or policies.

1.3 SURVEY AREA

The identified survey area for terrestrial fauna was approximately 5,708 acres, predominately occurring on the coastal areas within the Mānā Plain (see Figure 1-1). ‘Mauka’ survey areas (those areas toward higher elevation) of 1.0 acre and 600 square feet were surveyed on Mākaha Ridge and Miloli‘i Ridge, respectively (see Figure 1-1).

1.4 POTENTIALLY OCCURRING SPECIAL STATUS WILDLIFE SPECIES

A total of 14 federally and state-listed species are known to or have the potential to occur within PMRF and are presented in Table 1-1. PMRF and adjacent areas are largely non-native habitats; therefore, it was not expected that all species in Table 1-1 would or have the potential to occur in the terrestrial survey area.

Table 1-1 Special Status Wildlife Species Known to Occur or with Potential to Occur in the Survey Area

Scientific Name	*Common Name*	*Hawaiian Name*	*Regulatory Status*	*Habitat*
Birds				
Anas wyvilliana[1]	Hawaiian duck	Koloa moali	FE, SE	Common in a variety of natural and artificial wetland habitats
Fulica alai	Hawaiian coot	‘Alae ke‘oke‘o	FE, SE	Common in a variety of natural and artificial wetland habitats
Gallinula galeata sandvicensis	Hawaiian gallinule	‘Alae ‘ula	FE, SE	Common in a variety of natural and artificial wetland habitats
Himantopus mexicanus knudseni	Hawaiian stilt	‘Ae‘o	FE, SE	Common in a variety of natural and artificial wetland habitats
Branta sandvicensis	Hawaiian goose	Nēnē	FT, SE	Variety of habitats such as coastal dunes and grasslands, shrubland, and shrubland-woodland interfaces
Hydrobates castro	Band-rumped storm petrel	‘Akē ‘Akē	FE, SE	Colonies are in steep valleys vegetated with shrubs and grasses
Pterodroma sandwichensis	Hawaiian petrel	‘Ua‘u	FE, SE	Colonies occur in lower elevation forests dominated by native ‘ōhi‘a trees

Scientific Name	***Common Name***	***Hawaiian Name***	***Regulatory Status***	***Habitat***
Puffinus newelli	Newell's shearwater	'A 'o	FT, ST	Most colonies occur on steep, densely vegetated mountains and also nest on sparsely vegetated coastal cliffs along west Kaua'i
Phoebastria albatrus	Short-tailed albatross	Makalena	FE, SE	Small numbers of birds nest on outer Hawaiian islands and atolls and rarely visit Kaua'i
Vestiaria coccinea	Scarlet Hawaiian honeycreeper	'I'iwi	FT, ST	Mesic and wet native forest, above 1,250 meters
Mammals				
Lasiurus cinereus semotus[2]	Hawaiian hoary bat	'ōpe'ape'a	FE, SE	Occurring in a variety of landscapes, present throughout Hawai'i
Neomonachus schauinslandi	Hawaiian monk seal	Īlio holo i ka uaua	FE, SE	Occurring on beaches at Polihale, common throughout Hawai'i
Reptiles				
Chelonia mydas	Green sea turtle	Honu	FT, ST	Occurring on beaches at Polihale for both resting (hauling out) and nesting, common throughout Hawai'i
Invertebrates				
Drosophila musaphilia	Hawaiian picture-wing fly	-	FE, SE	*Acacia koa* forest within regions of Kōke`e State Park
Hylaeus spp.[3]	Hawaiian yellow-faced bee	Nalo meli maoli	FE, SE	Occurring on beaches in proximity to native coastal vegetation

Notes: [1]Hawaiian ducks are known to hybridize with mallards and such hybrids are difficult to distinguish in the field.
[2]Hawaiian hoary bats were surveyed for in a separate survey event and findings are addressed in a separate report.
[3]Not all species within the *Hylaeus* genus are ESA-listed species.
Selections for Listing Status Column include: FE = federal endangered, FT = federally threatened, SE = state endangered, ST = state threatened.
Source: DLNR, 2015; United States Fish and Wildlife Service, 2023.

1.5 SURVEY SCHEDULE AND PERSONNEL

Surveys were conducted over 7 days from 4–12 October 2023 (Field Survey Event 1) and again over 5 days from 1–5 April 2024 (Field Survey Event 2). Survey start/end times and weather descriptions for each survey day are included in Table 1-2. The team members involved in performing the project tasks are listed in Table 1-3 along with their project-specific roles. The survey personnel consisted of Hannah Hubanks, Clint Scheuerman, John Lowenthal, Jessica Hawkins, and Josh De Guzman.

Table 1-2 Survey Dates, Times, and Weather Conditions

Survey Date[a]	***Start Time***	***End Time***	***Weather Conditions***
Field Survey Event 1			
4 October 2023	1:00 p.m.	3:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
6 October 2023	10:30 a.m.	2:00 p.m.	Cloudy, light drizzle, mid-80s (°F)
8 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
9 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
10 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
11 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
12 October 2023	8:00 a.m.	4:00 p.m.	Clear, little wind, no rain, mid-80s (°F)
Field Survey Event 2			
1 April 2024	9:30 a.m.	5:00 p.m.	Partly cloudy, little wind, no rain, mid-80s (°F)
2 April 2024	7:30 a.m.	5:00 p.m.	Partly cloudy, little wind, no rain, mid-80s (°F)
3 April 2024	7:30 a.m.	5:00 p.m.	Partly cloudy, little wind, no rain, mid-80s (°F)
4 April 2024	7:30 a.m.	5:00 p.m.	Partly cloudy, little wind, no rain, mid-80s (°F)
5 April 2024	7:30 a.m.	11:30 a.m.	Partly cloudy, little wind, no rain, mid-80s (°F)

Note: [a]Survey date noted in Hawai‘i Standard Time.
Legend: °F = degree Fahrenheit.

Table 1-3 Survey Personnel

Role	***Name***
Project Manager	Ben Berridge
Senior Biologist	Clint Scheuerman
Senior Biologist	John Lowenthal
Biologist, Primary Site Health and Safety Coordinator	Hannah Hubanks
Biologist	Jessica Hawkins
Biologist	Josh De Guzman
Geographic Information System Specialist	Christine Chaplin

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CHAPTER 2
SURVEY METHODOLOGY

2.1 TERRESTRIAL SURVEY METHODS

Terrestrial biologists surveyed the entire survey area using the geographic information system (GIS) boundaries in Figure 1-1. One surveyor carried a portable Global Positioning System (GPS) unit with a tracking application to continuously track the movements of the surveyors, as depicted by the survey tracks in Figure 2-1. Surveys were completed by conducting point count surveys at established point count locations for all potentially occurring special status wildlife species. Surveyors also documented any occurrences of MBTA species and invasive or pest species at each observation point.

Based on the desktop analysis findings, the fauna survey area was divided into six zones based on terrain, vegetative cover, and potential habitat for wildlife (Table 2-1) (NAVFAC Pacific, 2023). Observation points within each zone were selected within the fauna survey area at regions anticipated to capture the most representative biological resources present, and based on accessibility (NAVFAC Pacific, 2023). Details of survey methods for each zone are also described in Table 2-1. The field survey personnel recorded incidental observations and conducted point count surveys for a minimum of 10 minutes at observation points within the survey area (79 observation points [including four incidental points] during Field Survey Event 1; 75 observation points during Field Survey Event 2) (Figure 2-1). While most observation points were utilized to assess wildlife occurrence in the immediate vicinity, certain observation points functioned as vantage points to view inaccessible regions within the survey area (such as the steep cliffs within Zone 1).

When stationary or walking for point count observations, surveyors used binoculars to scan for presence of wildlife. While driving through the survey area to reach various observation points and conduct the habitat assessment, the passenger surveyors scanned for presence of wildlife and notified the driver of any occurrences of special status wildlife. If special status wildlife was observed while driving, surveyors pulled the car off the road, stopped, and recorded the observation. The area at each observation point and along roads covered an approximate 100–200-meter radius from the surveyor's position; however, many points and roadways were surrounded by thick vegetation which obstructed views. To effectively survey such areas with obstructed views, surveyors adjusted viewing stance and direction to obtain the most efficient coverage of the survey area. The location and number of observed wildlife were recorded at the time of the observation. Locations of special status wildlife species were mapped using a portable GPS unit. At each observation point, the total number of wildlife individuals were recorded.

2.2 SURVEY EQUIPMENT AND STANDARDS

The surveyor team was equipped with one portable/handheld Eos Arrow 100 GPS unit with sub-meter level mapping accuracy (Eos, 2023) for Field Survey Event 1 and used mobile devices equipped with ArcGIS Field Maps for Field Survey Event 2. Following surveys, data were downloaded, backed up, and viewed to ensure data completeness prior to survey completion. Field survey personnel were equipped with proper clothing, personal protective equipment, and binoculars.

Table 2-1 Fauna Survey Zones within the Survey Area

Zone	***Description***	***Survey Method***
1	At approximately 40 to 700 feet elevation, Zone 1 includes land mauka of the Mānā Plain. In this zone, topography quickly steepens, vegetation becomes less dense, and consists of mostly unmanaged, non-native shrubland vegetation with some exposed soil and occasional steep cliff terrain. Wildlife consists mostly of invasive species such as pigs (*Sus scrofa*) and goats (*Capra hircus*); however, seabirds such as the white-tailed tropicbirds (*Phaethon lepturus*) may occur.	Observation points were selected based on known accessibility, visibility, and their representation of the zone characteristics, with focus on areas which may contain habitat features for special status wildlife species. Special attention was focused on binocular searches for wildlife on the steep terrain that cannot be reached by surveyors, where vantage points existed. Locations of observation points within Zone 1 are indicated on Figure 2-1.
2	Zone 2 includes floodable and water-retaining regions on the Mānā Plain such as mud flats and shallow ponds, as well as agricultural irrigation ditches and canals. Vegetation is dominated by invasive, non-native plants following agricultural disturbance, such as guinea grass (*Megathyrsus maximus*), kiawe (*Prosopis pallida*), and koa haole (*Leucaena leucocephala*). Wildlife consists of both native and non-native species with high potential for Hawaiian waterbirds which have been previously observed (NAVFAC Pacific, 2023).	Observation points were selected based on known accessibility, visibility, as well as surveyor knowledge of wildlife use of the area, with focus on areas probable to contain sufficient conditions for Hawaiian waterbirds. Locations of observation points within Zone 2 are indicated on Figure 2-1.
3	Zone 3 contains unmanaged, non-native vegetation within agricultural land, and is dominated by koa haole and kiawe shrubland. Various areas exist adjacent to agricultural irrigation ditches, which provide habitat for wildlife. Wildlife consists of mostly non-native and invasive species, with some habitat for special status wildlife species near irrigation ditches and canals.	Observation points were selected based on their known accessibility, visibility, and representation of the zone characteristics, with focus on areas which may contain habitat features for special status wildlife species. Zone 3 also includes broad coverage incidental surveying between observation points, conducted by vehicle along accessible agricultural roads at speeds no greater than 10 mph. Locations of observation points within Zone 3 are indicated on Figure 2-1.
4	Zone 4 consists of managed agricultural land, which may include actively cultivated or fallow fields. Perimeters of fields offer some habitat for wildlife, and presence of irrigation ditches offer moderate potential for special status wildlife species (e.g., Hawaiian waterbirds) to occur in the area.	Observation points were selected based on their known accessibility, visibility, and representation of the zone characteristics, with focus on areas which may contain habitat features for special status wildlife species. Zone 4 also included broad coverage incidental surveying between observation points, conducted by vehicle along accessible agricultural roads at speeds no greater than 10 mph. Locations of observation points within Zone 4 are indicated on Figure 2-1.
5	At elevations of approximately 1,770 to 1,980 feet, Zone 5 is a small mauka survey region on Mākaha and Miloli‘i Ridges. Vegetation is moderately to sparsely present consisting of mixed Hawaiian shrubs with some potential habitat for birds. On the steep cliffs adjacent to the survey areas, habitat for federally-listed and MBTA seabirds has been documented.	As all four mauka survey areas are small (200 feet maximum width on Mākaha Ridge, and 20 feet maximum width on Miloli‘i Ridge), the selected observation points visually covered all potential habitats within and near to the zone. Locations of observation points within Zone 5 are indicated on Figure 2-1.

Zone	***Description***	***Survey Method***
6	Zone 6 occurs within Polihale State Park and contains coastal dunes dominated by non-native shrubs and grasses and native cover such as naupaka (*Scaevola sencea*). Wildlife may include seabirds, green sea turtle (*Chelonia mydas*), Hawaiian monk seal (*Neomonachus schauinslandi*), and Hawaiian yellow-faced bee *(Hylaeus* spp.*).*	As driving through this zone is limited due to sandy terrain, surveyors included broad coverage incidental surveying by walking to each observation point and surrounding areas. The observation points were selected based on known accessibility, visibility, and their representation of the zone characteristics, with focus on areas which may contain habitat features for special status wildlife species. Locations of observation points within Zone 6 are indicated on Figure 2-1.

Legend: MBTA = Migratory Bird Treaty Act; mph = miles per hour.

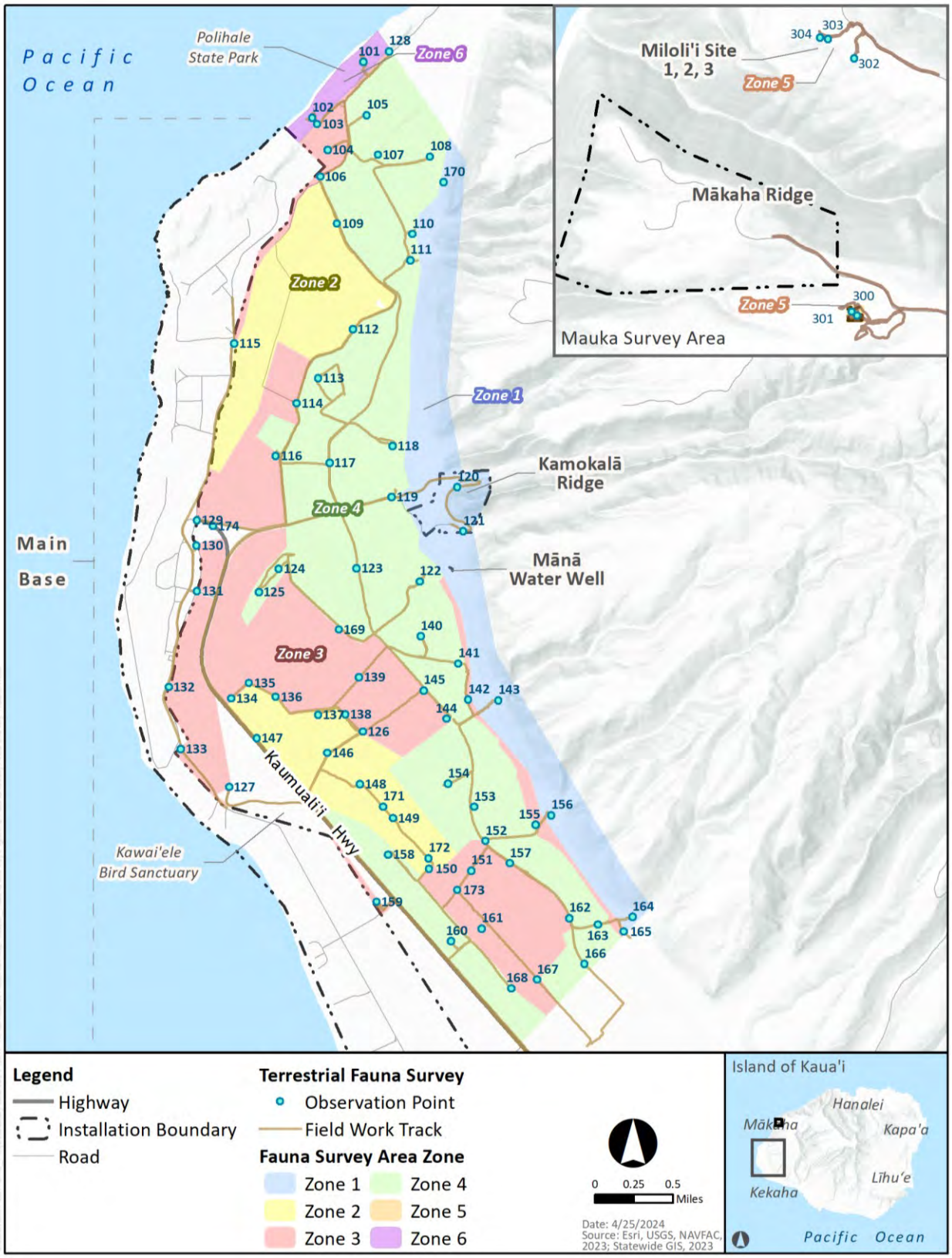

Figure 2-1 Survey Tracks

2.3 DATA COLLECTED

2.3.1 Special Status Wildlife Species

At each established point count observation location, when and where special status wildlife species, MBTA species, or general wildlife species were detected, the field survey personnel documented the following on a GPS unit:

1. Species name(s) and numbers of individuals.
2. GPS location.
   a. Location points were generally collected at the established point count observation locations and all species detected were noted as occurring at that point.
   b. For observations made from a vantage point for an inaccessible region in the survey area, approximate distance and direction from observation point were recorded.
3. Life stage (e.g., adult, juvenile, etc.) (if discernible in the field).
4. Condition (e.g., dead, poor, fair, good, etc.) (if discernible in the field).

Representative photos of wildlife observed during the surveys are provided in Appendix A.

2.3.2 Habitat Assessment

At each observation point, the field survey personnel documented the following:

1. Dominant plant species of the immediate surrounding environment
2. Presence/absence of water features (e.g., wetland, irrigation ditch, or canal)
3. Presence/absence of agricultural activity

Representative photos of habitat taken during the surveys are provided in Appendix A.

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CHAPTER 3
SURVEY RESULTS

Results of the terrestrial fauna surveys are summarized in Tables 3-1 and 3-2 and are depicted in Figures 3-1 through 3-8 (Field Survey Event 1 in Figures 3-1 through 3-4; Field Survey Event 2 in Figures 3-5 through 3-8). Appendix A contains a photographic record of the survey area, and Appendix B contains a complete data matrix for GIS species data collected during the surveys. All GIS survey data collected in the field have been provided to NAVFAC Pacific as a part of this deliverable.

3.1 SPECIAL STATUS WILDLIFE SPECIES

Table 3-1 details the survey data collected for the special status wildlife species that were observed and mapped. While the surveys could not eliminate the potential of recounting individuals from day to day or between observation points, efforts were made to reduce such repeat counts of wildlife at neighboring observation points by observing wildlife directions of travel to and from each point. Additionally, survey observation point count locations were generally distanced well enough away from each other to reduce the likelihood of recounting individuals. In total during Field Survey Event 1, 39 Hawaiian ducks (*Anas wyvilliana*) and/or Hawaiian duck/mallard hybrids, 24 Hawaiian coots (*Fulica alai*), 16 Hawaiian gallinules (*Gallinula galeata sandvicensis*), 27 Hawaiian stilts (*Himantopus mexicanus knudseni*), and 126 Hawaiian geese or nēnē *(Branta sandvicensis*) were observed and mapped. Two Hawaiian yellow-faced bees (*Hylaeus* spp.) were observed; however, species-level identification could not be obtained to confirm if the observation was an ESA-listed species (both listed and non-listed species occur within the genus). In total during Field Survey Event 2, 66 Hawaiian ducks and/or Hawaiian duck/mallard hybrids, 35 Hawaiian coots, 27 Hawaiian gallinules, 86 Hawaiian stilts, and 225 Hawaiian geese were observed and mapped.

Table 3-2 summarizes the survey data collected for species protected under the MBTA that were observed and mapped. Fourteen species of birds protected under the MBTA were documented in the survey area during the surveys, performing a variety of activities such as flying, foraging, and loafing (Table 3-2). Discussions of mapped individuals of special status and other wildlife species are provided in Chapter 4.

Table 3-1 Special Status Wildlife Species Observed

Scientific Name	***Common Name***	***ESA or SOH-Listed Status***	***Number of Individuals: Event 1***	***Life Stage/Condition/Notes: Event 1***	***Number of Individuals: Event 2***	***Life Stage/Condition/Notes: Event 2***
Anas wyvilliana[1]	Hawaiian duck	FE, SE	39	Adults observed foraging, flying, and loafing, mostly within wetland habitats	66	Adults observed foraging, flying, and loafing, mostly within wetland habitats
Fulica alai	Hawaiian coot	FE, SE	24	Adults observed foraging, flying, and loafing, mostly within wetland habitats	35	Adults observed foraging, flying, and loafing, mostly within wetland habitats
Gallinula galeata sandvicensis	Hawaiian gallinule	FE, SE	16	Adults observed foraging, flying, and loafing, mostly within wetland habitats	27	Adults and juveniles observed foraging, flying, and loafing, mostly within wetland habitats
Himantopus mexicanus knudseni	Hawaiian stilt	FE, SE	27	Adults observed foraging, flying, and loafing, mostly within wetland habitats	86	Adults observed foraging, flying, loafing, and nesting, mostly within wetland habitats
Branta sandvicensis	Hawaiian goose	FT, SE	126	Adults observed foraging, flying, and loafing, mostly within wetland habitats	225	Adults and goslings observed foraging, flying, and loafing, mostly within wetland habitats and in manicured grass areas
Hylaeus spp.[2]	Hawaiian yellow-faced bee	N/A	2	Individuals observed pollinating native coastal vegetation	0	N/A

Note: [1]Hawaiian ducks are known to hybridize with mallards and such hybrids are difficult to distinguish in the field.
[2]*Hylaeus* genus was observed; however, species identification could not be obtained to confirm if the observation was an ESA-listed species.

Legend: ESA = Endangered Species Act; FE = federal endangered; FT = federally threatened; N/A = not applicable; SE = state endangered; SOH = State of Hawai‘i.

Table 3-2 Migratory Bird Treaty Act Species Observed

Scientific Name	***Common Name***	***Number of Individuals: Event 1***	***Life Stage/Condition/Notes: Event 1***	***Number of Individuals: Event 2***	***Life Stage/Condition/Notes: Event 2***
Bubulcus ibis	Cattle egret	472	Healthy adult individuals, observed foraging	309	Healthy adult individuals, observed foraging
Pluvialis fulva	Pacific golden plover	18	Healthy adult individuals, observed foraging and in flight	19	Healthy adult individuals, observed foraging and in flight
Tringa incana	Wandering tattler	2	Healthy adult individuals, observed foraging in wetland habitat	0	N/A
Fregata minor	Great frigatebird	4	Adult individuals, observed in flight above agricultural land	0	N/A
Nycticorax nycticorax	Black-crowned night heron	39	Healthy adult individuals, observed foraging and in flight	34	Healthy adult and juvenile individuals, observed foraging and in flight
Cardinalis cardinalis	Northern cardinal	12	Healthy adult individuals, observed foraging, in flight, and perched	56	Healthy adult individuals, observed foraging, in flight, and perched
Haemorhous mexicanus	House finch	46	Healthy adult individuals, observed foraging, in flight, and perched	11	Healthy adult individuals, observed foraging, in flight, and perched
Phaethon lepturus	White-tailed tropic bird	5	Adults observed in flight	4	Adults observed in flight
Mimus polyglottos	Northern mockingbird	11	Healthy adult individuals, observed foraging, in flight, and perched	2	Healthy adult individuals, observed while perched
Asio flammeus sandwichensis[1]	Hawaiian Short-eared owl	5	Adults observed flying, perched, and hunting in open grassy or agricultural regions	2	Adults observed flying and hunting in above agricultural regions
Tyto alba	Barn owl	1	Deceased adult, observed on the shoulder of an unpaved road	0	N/A
Plegadis chihi	White-faced ibis	0	N/A	1	Healthy nonbreeding/immature individual observed foraging in wetland habitat
Calidris alba	Sanderling	0	N/A	1	Healthy adult observed foraging in wetland habitat
Arenaria interpres	Ruddy turnstone	0	N/A	1	Healthy adult observed foraging in streambank habitat

Note: [1]Hawaiian short-eared owl is State-Listed as Endangered on the island of ‘Oahu. On the island of Kaua‘i, the species only has MBTA status.
Legend: N/A = not applicable.

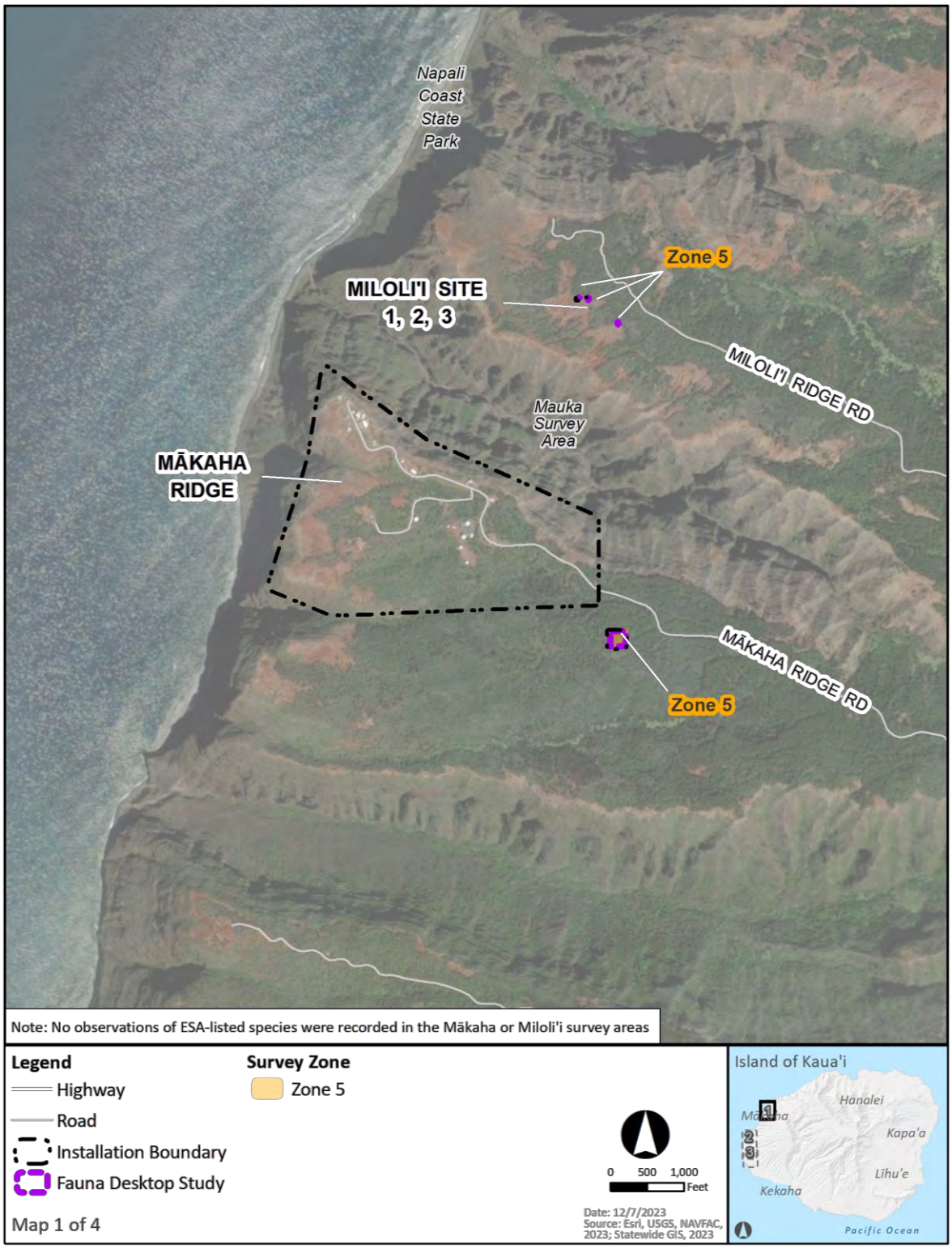

Figure 3-1 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 1 – Mauka

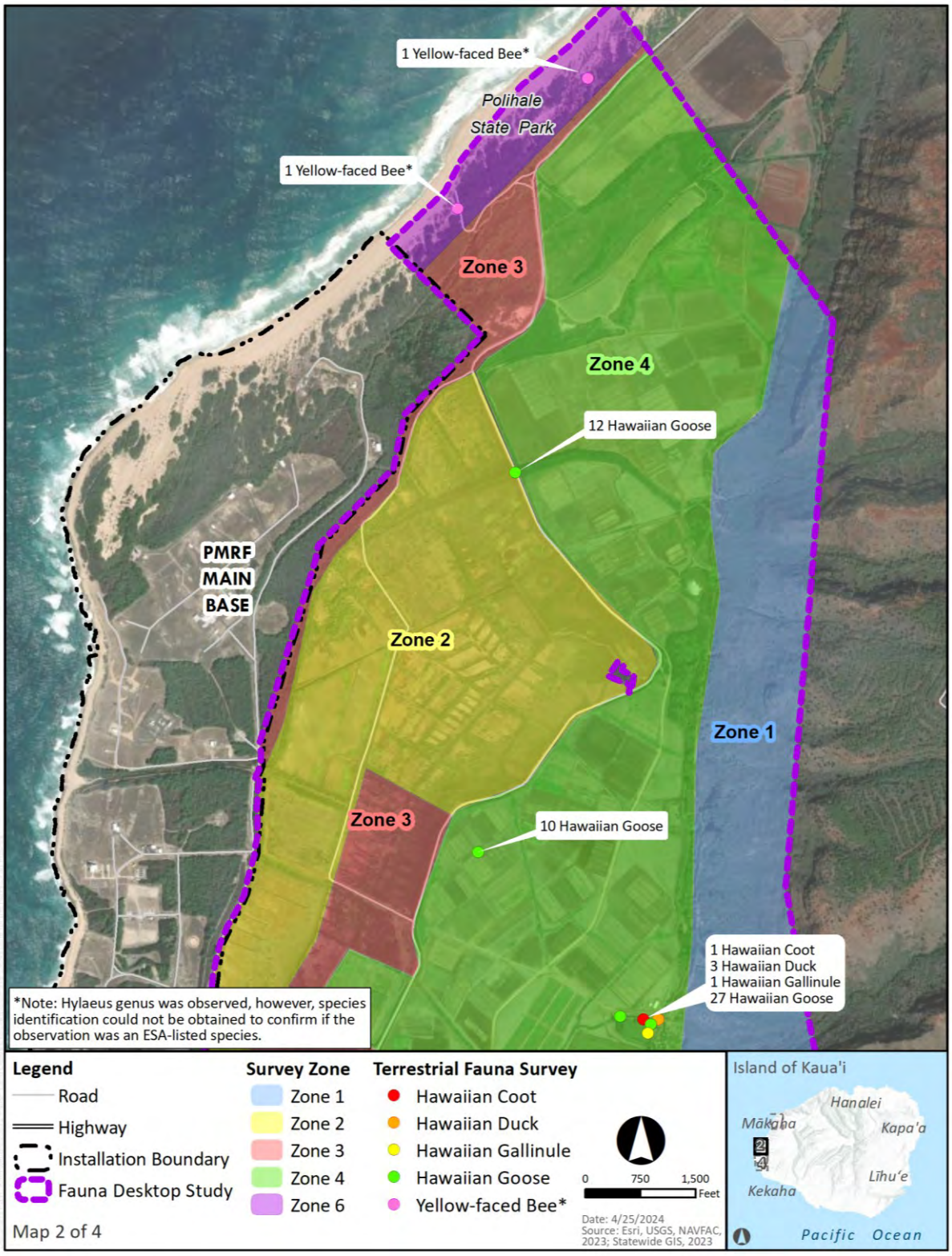

Figure 3-2 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 1 – North

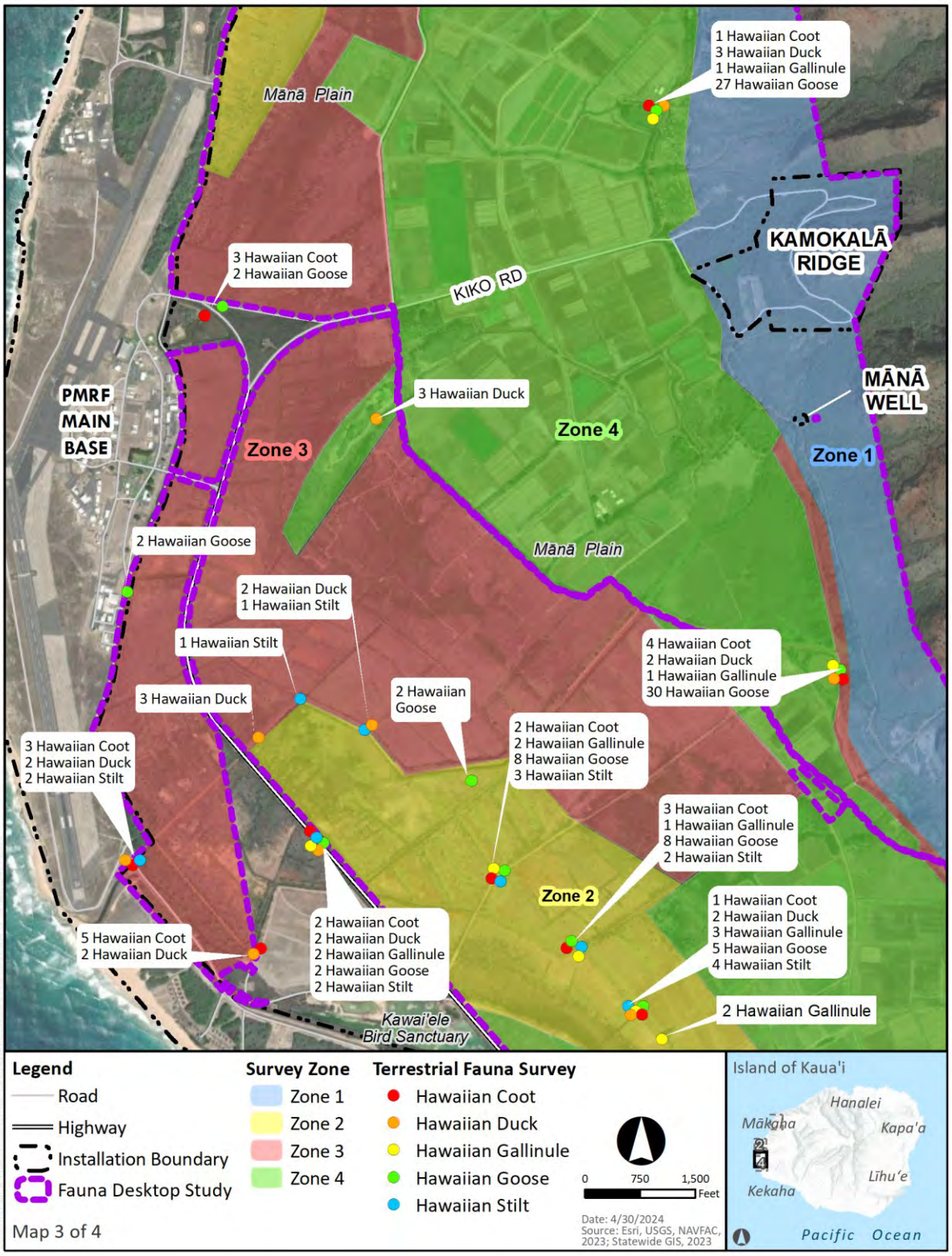

Figure 3-3 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 1 – Central

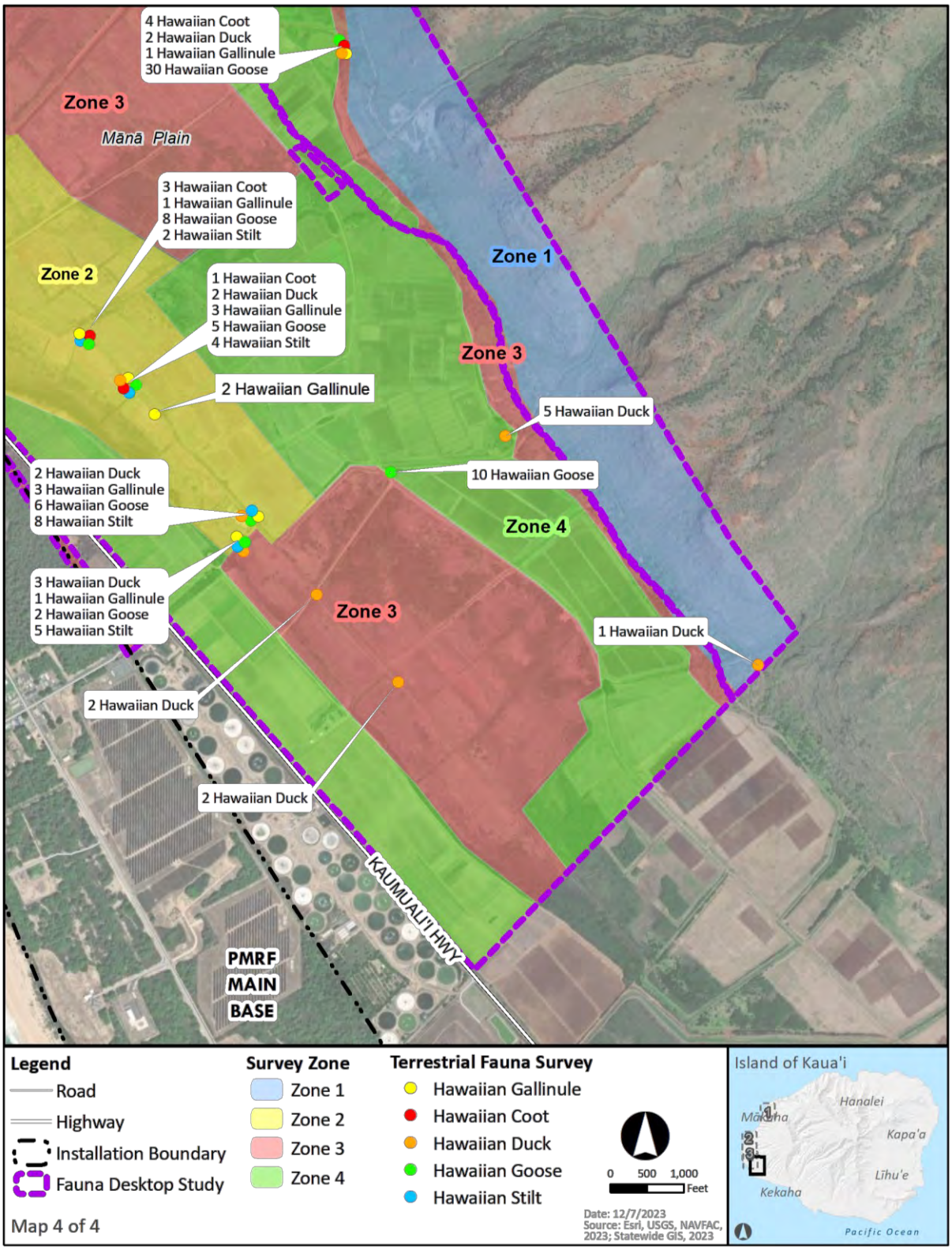

Figure 3-4 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 1 – South

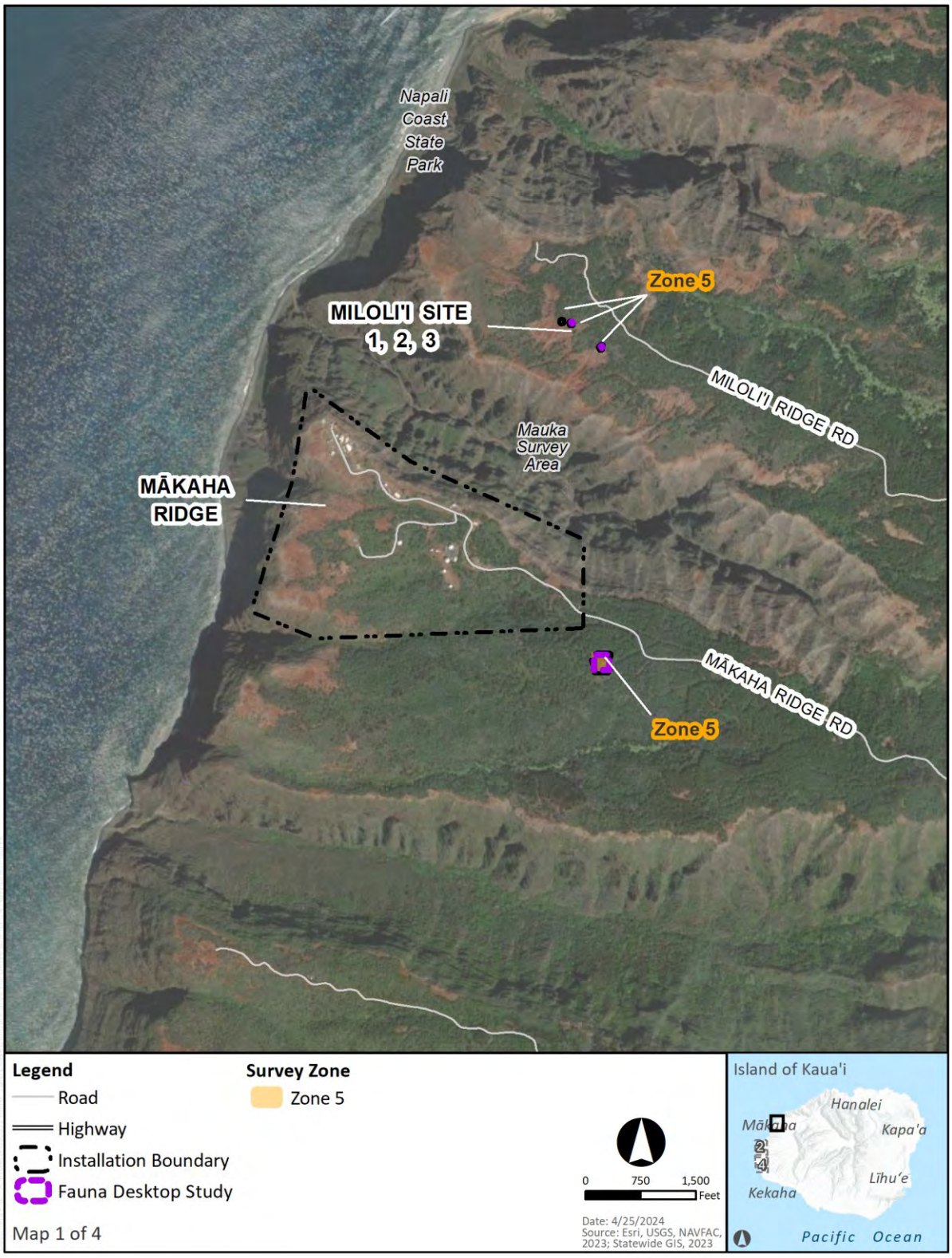

Figure 3-5 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 2 – Mauka

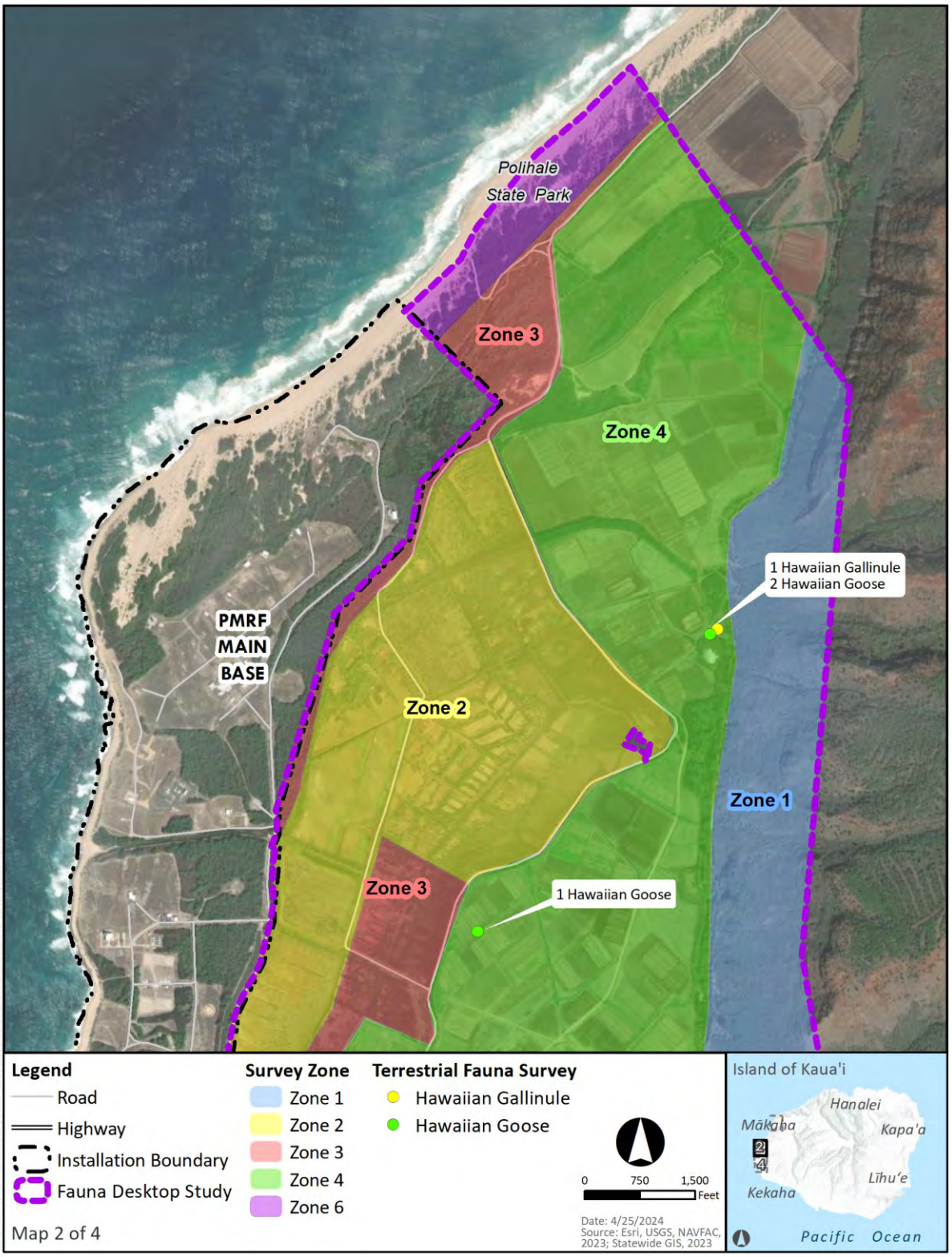

Figure 3-6 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 2 – North

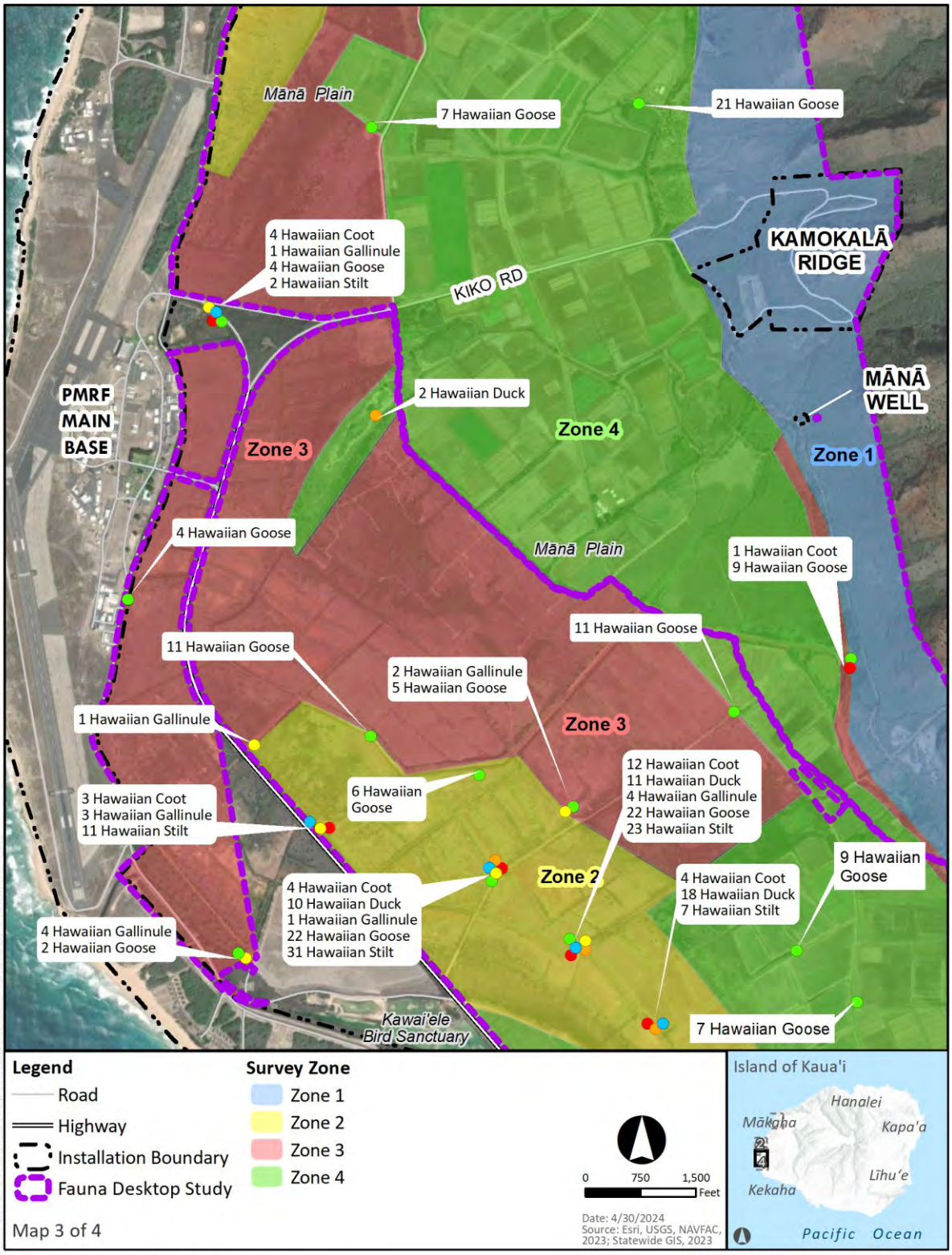

Figure 3-7 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 2 – Central

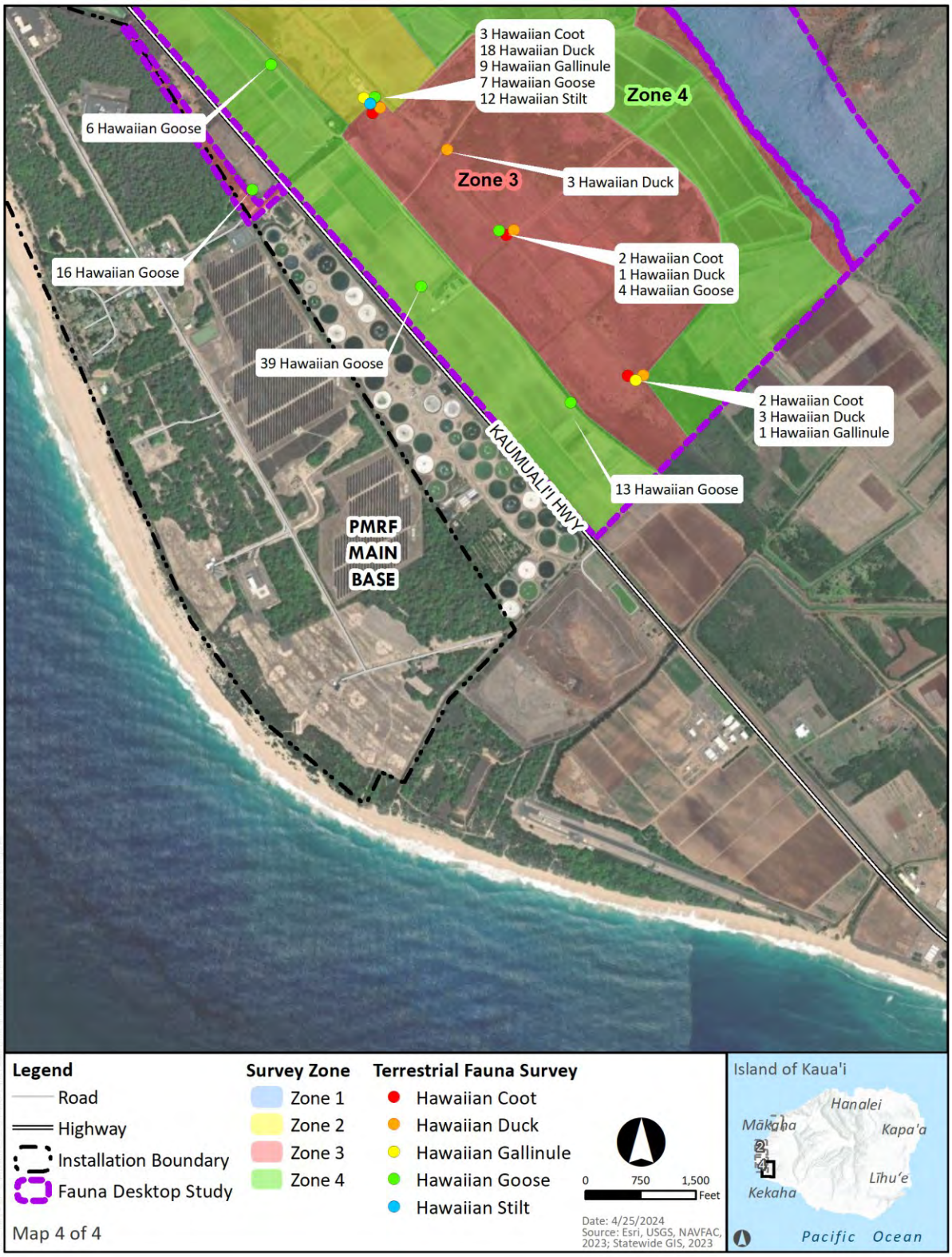

Figure 3-8 ESA-Listed Species Observations within the Fauna Survey Area during Field Survey Event 2 – South

3.2 OTHER WILDLIFE SPECIES OBSERVED

Common bird species were observed throughout the survey area performing a variety of activities such as flying, foraging, and resting/perching. Common bird species observed included zebra dove (*Geopelia striata*), house sparrow (*Passer domesticus*), spotted dove (*Spilopelia chinensis*), warbling white-eye (*Zosterops japonicus*), common myna (*Acridotheres tristis*), java sparrow (*Padda oryzivora*), common waxbill (*Estrilda astrild*), scaly-breasted munia (*Lonchura punctulate*), chestnut munia (*Lonchura atricapilla*), African silverbill (*Euodice cantans*), red-crested cardinal (*Paroaria coronate*), rose-ringed parakeet (*Psittacula krameria*), red junglefowl (*Gallus gallus*), and rock pigeon (*Columba livia*). Less frequent observations of the white-rumped shama (*Copsychus malabaricus*), saffron finch *(Sicalis flaveola*), ring-necked pheasant (*Phasianus colchicus*), black francolin (*Francolinus francolinus*), Erckel's francolin (*Pternistis erckelii*), and grey francolin (*Ortygornis pondicerianus*) were documented.

Mammals observed in the survey area included black-tailed deer (*Odocoileus hemionus hemionus),* donkey (*Equus asinus*), feral cat (*Felis catus*), feral goat (*Capra hircus*), feral pig (*Sus scrofa*), and cow (*Bos taurus*). Cane toad (*Rhinella marina*), alive and deceased, were also prevalent across the survey area. A single occurrence of an individual moth skink (*Lipinia noctua*) was documented in the survey area. The complete list of species observations is provided in Appendix C and total counts of each species collected during the surveys are documented in Appendix B.

3.3 HABITAT ASSESSMENT

The suitability of potential wildlife habitat in the fauna survey area was conducted concurrently during fauna species surveys. Utilizing road networks within the survey area, surveyors visually assessed all portions of the survey area for wildlife habitat, and survey personnel documented the dominant plant community and land cover at each observation point. Additionally, any notable vegetation was recorded as well as any high disturbance or prevalence of invasive plant species.

Overall, the survey area is highly disturbed and dominated by non-native and invasive plant species, with a system of agricultural irrigation canals throughout and some wetland and flooded regions. Summaries of the habitat suitability within each of the six survey zones, including characteristic plant species, and notable habitat containing desirable special status wildlife species habitat are described below. Characteristic photos of each zone are presented in Appendix A.

3.3.1 Zone 1

Zone 1 is characterized by steep topography with minimal to no vegetation along ridgelines and is dominated by mixed kiawe (*Prosopis pallida*) and koa haole (*Leucaena leucocephala*) scrub at lower elevations where vegetation is present. These vegetated areas additionally included fast-growing weedy species such as guinea grass (*Megathyrsus maximus*). The portion of Zone 1 within the Kamokalā Ridge installation is dominated by koa haole scrub with the addition of native wiliwili (*Erythrina sandwicensis*) trees throughout. Some suitable habitat for white-tailed tropicbirds (*Phaethon lepturus*) exists within Zone 1. Agricultural lands occur at the base of the steep cliffs along the majority of this zone.

3.3.2 Zone 2

Zone 2 is characterized by open floodable land and water-retaining regions such as mud flats and shallow ponds, as well as agricultural irrigation ditches. Areas containing wetlands are dominated by sea purslane (*Sesuvium portulacastrum*) as well as camphorweed *(Pluchea indica*) around perimeters. Regions of Zone 2 containing irrigation ditches were dominated by kiawe-koa haole scrub and fast-growing non-native plants

along the banks and adjacent to the water including species such as java plum (*Syzygium cumini*). Suitable habitat for Hawaiian duck, Hawaiian coot, Hawaiian gallinule, Hawaiian stilt, and nēnē (referred to as the Hawaiian waterbirds) exists throughout Zone 2 (see Figures 3-2 through 3-8).

3.3.3 Zone 3

Zone 3 is dominated by non-native vegetation adjacent to agricultural land, primarily kiawe-koa haole scrub and an understory of guinea grass. Generally, this zone provides minimal habitat for special status wildlife species; however, some regions within Zone 3 occur adjacent to agricultural irrigation ditches which provide habitat for Hawaiian waterbirds.

3.3.4 Zone 4

Zone 4 consists primarily of managed agricultural land, including both actively cultivated and fallow fields. Crops observed include papaya (*Carica papaya*), mango (*Mangifera indica*), kale (*Brassica oleracea var acephala*), corn (*Zea mays*), and taro (*Colocasia esculenta*). Conservation cover is prevalent in fallow fields throughout this zone, dominated by volunteer grasses and occasionally, sunn hemp (*Crotalaria juncea*). Vegetation within windbreaks and along field borders includes kiawe-koa haole scrub, monkeypod (*Samanea saman*), castor bean (*Ricinus communis*), guinea grass, and variegated hau (*Hibiscus tiliaceus*). Golden crownbeard (*Verbesina encelioides*) was observed in some fallow fields. Open fields offer suitable foraging habitat for the pueo and a variety of birds including cattle egret (*Bubulcus ibis*) and many passerine bird species. Perimeters of fields that occur adjacent to irrigation ditches offer some suitable habitat for Hawaiian waterbirds.

3.3.5 Zone 5

The mauka survey regions within Zone 5 are characterized by slash pine (*Pinus elliottii*) canopy, and an understory dominated by lantana (*Lantana camara*), as well as presence of silky oak (*Grevillea robusta*), strawberry guava (*Psidium cattleianum*), ‘a‘ali‘i (*Dodonea viscosa*), and tufted beardgrass (*Schizachyrium condensatum*). Minimal suitable habitat for special status wildlife exists within the boundaries of the survey area in Zone 5; however, some suitable habitat for the white-tailed tropicbird exists along steep cliff terrain adjacent to the survey area (approximately 1,000 feet south of observation points 302–304).

3.3.6 Zone 6

Zone 6 is characterized by coastal dunes dominated by native and non-native shrubs and grasses. Plants observed include beach naupaka (*Scaevola taccada*), pohinahina (*Vitex rotundifolia*), and naio (*Myoporum sandwicense*). On the south side of the dunes, kiawe-koa haole scrub dominates the landscape with minimal understory. The coastal dunes provide suitable habitat for Hawaiian yellow-faced bee (see Figure 3-2). North of the dunes within Zone 6, the beaches provide suitable habitat for green sea turtle (*Chelonia mydas*), Hawaiian monk seal (*Neomonachus schauinslandi*), and seabirds.

3.4 NOTABLE HABITAT

At observation points 118, 126, 133, 141, 146, 147, 148, 149, 150, 171, 172, and 174, considerable habitat was observed to be suitable and highly utilized by Hawaiian waterbirds and MBTA species. Wetlands, mud flats, and reservoir water in these locations provide sufficient habitat for such species (see Appendix A).

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CHAPTER 4
DISCUSSION

This section provides details on the special status wildlife and invasive species observed and mapped during the terrestrial surveys. Specific coordinates of all mapped points for species locations are provided in Appendix B.

4.1 FEDERALLY-LISTED HAWAIIAN WATERBIRDS

Prior to its drainage and conversion to agricultural lands during the early 1900s, approximately 1,700 acres of permanent, semi-permanent, and seasonal wetlands were present on the Mānā Plain which hosted considerable habitat for Hawaiian waterbirds (Department of the Navy [DON], 2023). A total of 232 Hawaiian waterbirds (all adults) were observed throughout the Mānā Plain during Field Survey Event 1, and a total of 439 (including 17 juveniles) during Field Survey Event 2, favoring regions that still contain wetlands and mud flats, as well as irrigation canals (see Table 3-1).

Most commonly, the Hawaiian waterbirds were documented while the birds were foraging in wetland habitats. Notably, four Hawaiian stilts were observed on their nests with unhatched eggs at observation points 148 and 149. The juvenile Hawaiian gallinule and Hawaiian coot observations were all nearly mature, while the non-adult Hawaiian geese were chicks with no mature feathers (see Appendix A).

4.2 HAWAIIAN YELLOW-FACED BEE

Two individual Hawaiian yellow-faced bees were documented in separate locations along the coastal dunes in the survey area during Field Survey Event 1, both were visiting native plants at the time of the observations (pohinahina) (see Figure 3-2). Seven species within the genus are federally-listed as endangered; 56 additional non-listed species exist, some of which also occur in coastal regions. While a limited number of species have the potential to occur in the survey area, there is potential for both listed and non-listed species. As such, species-level identification could not be obtained to confirm if the observations were ESA-listed species. Previous data regarding the bee's presence at Polihale documented five species of *Hylaeus* (Magnacca, 2007). No observations were made of the genus during Field Survey Event 2.

4.3 MIGRATORY BIRD TREATY ACT PROTECTED SPECIES

Fourteen species of birds protected under the MBTA were observed performing a variety of activities such as flying, foraging, and resting within the survey area (see Table 3-2). All individuals appeared healthy, and all were adults apart from two observations of juvenile black-crowned night heron. Suitable habitat exists for a variety of migratory birds throughout the survey area (see Appendix B). Most of the MBTA bird species observed during surveys are considered ubiquitous in Hawai‘i. A few species are considered less common in the area and are described in greater detail below.

A total of nine white-tailed tropic birds were observed flying: in the mauka survey area (between the cliffs of Mākaha and Miloli‘i Ridges), over the Mānā Plain (along the cliffs), as well as above Kamokalā Ridge (mauka side). Individual great frigatebirds were documented at four locations flying over the Mānā Plain.

Single individuals of white-faced ibis (*Plegadis chihi*), sanderling *(Calidris alba*), and ruddy turnstone (*Arenaria interpres*), as well as two wandering tattlers *(Tringa incana*), were observed in wetland habitats (see Table 3-2). Notably, the white-faced ibis is considered a rare sighting in Hawai‘i, but may be observed

in circumstances where individuals are blown off course during migration, where they rest and/or forage in suitable habitats before continuing on their migration.

The Hawaiian short-eared owl or pueo (*Asio flammeus sandwichensis*) is only State-listed as endangered on the island of O‘ahu, but is protected under the MBTA on the island of Kaua‘i. Suitable foraging habitat exists throughout the survey area for the pueo. A total of seven adult individuals were documented, five of which were observed in flight and actively foraging on fallow agricultural fields. The other two individuals were observed perched in trees, adjacent to unmanaged agricultural lands. The pueo is commonly observed at Barking Sands although no confirmed instances of breeding on the base have been recorded (DON, 2023).

4.4 INVASIVE SPECIES

A variety of non-native and/or invasive wildlife species were observed throughout the survey area; predominantly black-tailed deer, feral goat, feral pig, barn owl, and cane toad. Non-native predators are the primary invasive animal management issue at PMRF (DON, 2023). Feral cats, pigs, cattle egrets, and barn owls can depredate the adults or young of ESA- and MBTA-listed species. Barn owls also likely displace the native owl species, the pueo (DON, 2023). While cattle egret is an MBTA species, they predate on native bird eggs and are considered an invasive species in Hawai‘i and are under a control order at PMRF. Golden crownbeard *(Verbesina encelioides*) was observed, and due to the toxic properties produced by the plant, cattle who graze on this plant can become lethargic or incur fatalities. Rose-ringed parakeets were observed in abundance during Field Survey Event 2, which were not observed during Field Survey Event 1. No observations of presence or sign of mongoose (*Herpestes javanicus*), coqui frog (*Eleutherodactylus coqui*), little fire ant (*Eleutherodactylus coqui*), or coconut rhinoceros beetle (*Oryctes rhinoceros*) were made during the fauna survey, although coconut rhinoceros beetle traps were observed in various locations throughout the survey area.

CHAPTER 5
REFERENCES

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Appendix A
Survey Photographic Record

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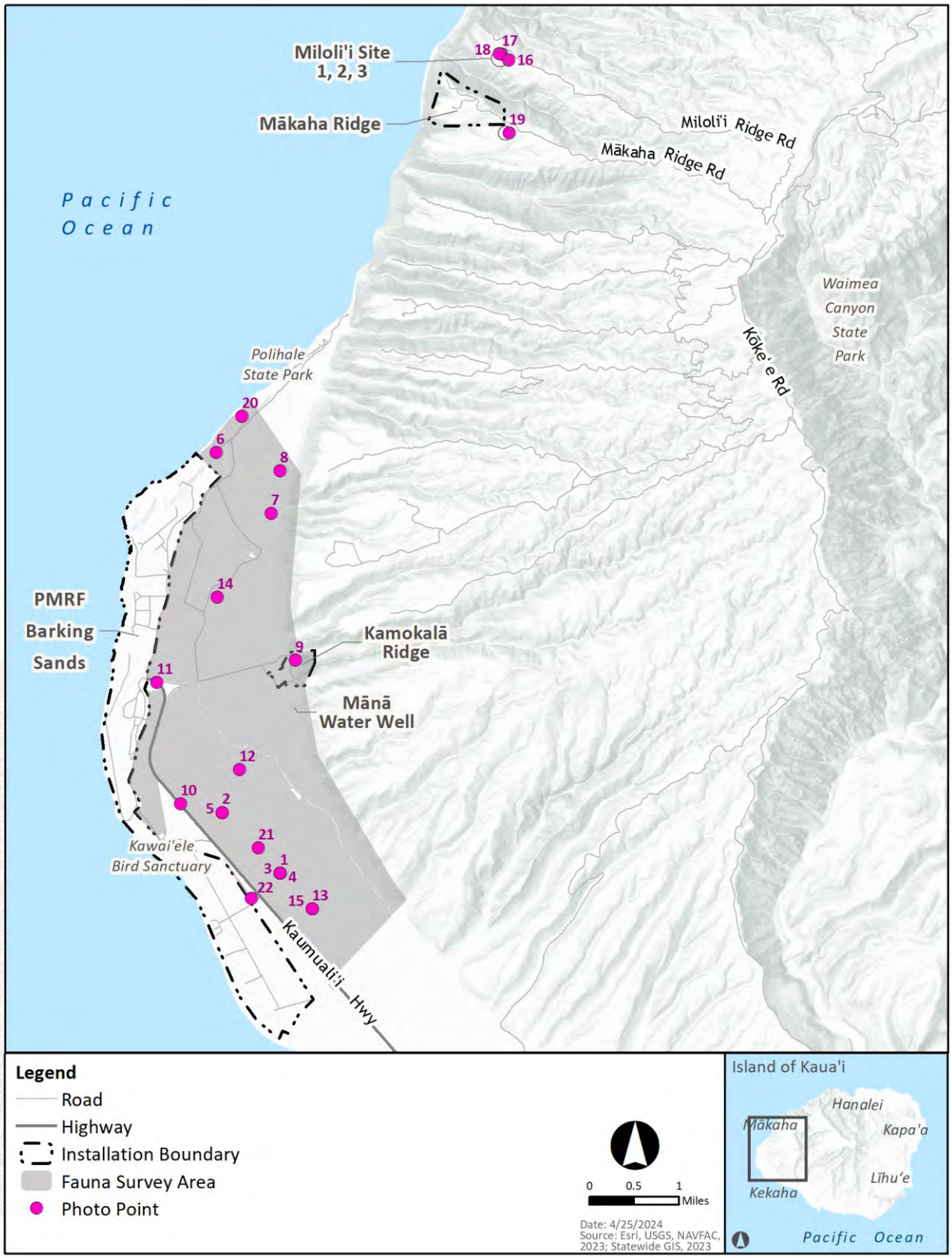

Figure A Photograph Locations

Photo 1. Hawaiian goose (*Branta sandvicensis*), Hawaiian coot (*Fulica alai*), and Hawaiian stilt (*Himantopus mexicanus knudseni*) foraging at mudflats on the Mānā Plain (Observation Point 172).

Photo 2. Hawaiian gallinule (*Gallinula galeata sandvicensis*) foraging along irrigation canals on the Mānā Plain (Observation Point 146).

Photo 3. Hawaiian coot and Hawaiian stilt foraging in an irrigation canal on the Mānā Plain (Observation Point 172).

Photo 4. Hawaiian stilt foraging in mudflats on the Mānā Plain (Observation Point 172).

Photo 5. Black-crowned night heron (*Nycticorax nycticorax*) perched along an irrigation canal on the Mānā Plain (Observation Point 146).

Photo 6. Hawaiian short-eared owl (*Asio flammeus sandwichensis*) perched in koa haole (*Leucaena leucocephala*) trees near agricultural fields (Observation Point 103).

Photo 7. Land cover representative of Zone 1, including steep topography with minimum vegetation on steep slopes. Guinea grass (*Megathyrsus maximus*), lion's ear (*Leonotis nepetifolia*) and koa haole predominately occur in the lower elevation regions of Zone 2 (Observation Point 110).

Photo 8. Land cover representative of Zone 1, including steep topography and minimum vegetation on slopes. Active and fallow agricultural lands occur at the base of the cliffs (Observation Point 108).

Photo 9. Land cover representative of Kamokalā Ridge within Zone 1, including wiliwili (*Erythrina sandwicensis*), koa haole, and non-native dry grasses (Observation Point 120).

Photo 10. Land cover representative of Zone 2, including flooded mudflat and vegetative scrub including camphorweed (*Pluchea indica*), mixed kiawe (*Prosopis pallida*), and koa haole scrub (Observation Point 147).

Photo 11. Land cover representative of Zone 2, including sea purslane (*Sesuvium portulacastrum*), guinea grass, and camphorweed (Observation Point 174).

Photo 12. Land cover representative of Zone 3, including unmanaged vegetation such as umbrella sedge (*Cyperus alternifolius*), koa haole, and guinea grass (Observation Point 139).

Photo 13. Land cover representative of Zone 3, containing some irrigation canals throughout surrounded by unmanaged vegetation such as koa haole, shoreline sea purslane (*Sesuvium portulacastrum*), and camphorweed (Observation Point 161)

Photo 14. Land cover representative of Zone 4, including large flocks of cattle egret (*Bubulcus ibis*) foraging in tilled soil. Fields of fallow land contain non-native grasses and vegetative scrub (Observation Point 113).

Photo 15. Land cover representative of Zone 4, including non-native scrubland and grasses, koa haole, and guinea grass within and surrounding acres of active and fallow agricultural lands (Observation Point 161).

Photo 16. Land cover representative of Zone 5, including bare, rocky soil, tufted beardgrass (*Schizachyrium condensatum*), and slash pine (*Pinus elliottii*) canopy (Observation Point 302).

Photo 17. Land cover representative of Zone 5, including tufted beardgrass and slash pine (Observation Point 303).

Photo 18. Land cover representative of Zone 5, including tufted beardgrass, a‘ali‘i (*Dodonaea viscosa*), and slash pine canopy (Observation Point 304).

Photo 19. Land cover representative of Zone 5, including lantana understory and slash pine canopy (Observation Point 300).

Photo 20. Land cover representative of Zone 6, including koa haole, beach naupaka (*Scaevola taccada*), koa haole, and kiawe on rolling sand dunes at Polihale Beach (Observation Point 101).

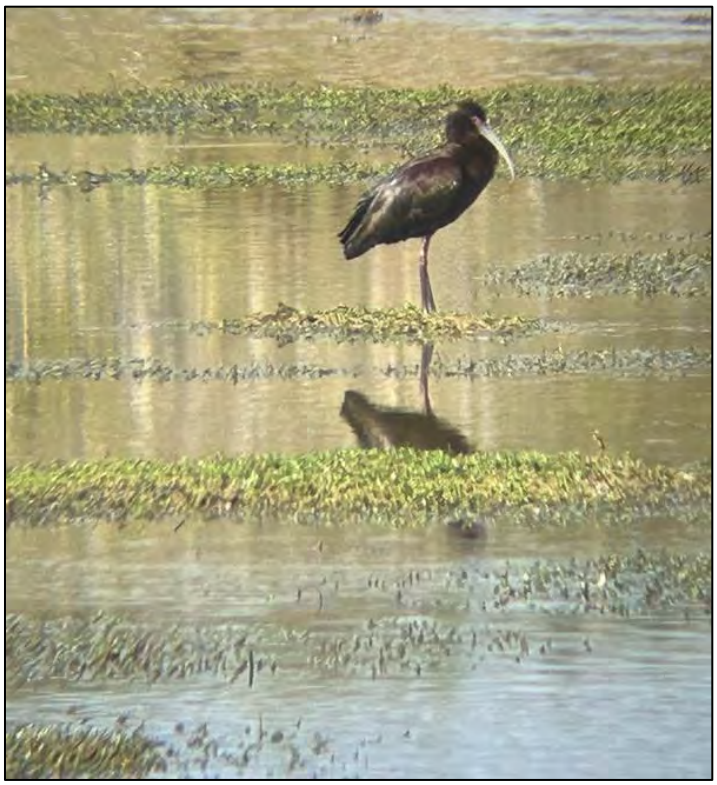

Photo 21. A nonbreeding white-faced ibis foraging in wetland habitat on the Mānā Plain (Observation Point 149).

Photo 22. Nēnē goslings near the PMRF entrance gates (Observation Point 159).

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Appendix B
Survey Summary Data Matrix

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Table B-1. Field Survey Event 1 Data Matrix

Observation Point ID	*Common Name*	*Scientific Name*	*Health Condition*	*Life Stage*	*Number Observed*	*ESA Status*	*State Status*	*Vegetation/Habitat*	*MBTA Species (Yes/No)*	*Latitude*[1]	*Longitude*
101	Hawaiian Yellow-faced Bee	*Hylaeus* sp.	Good	Adult	1	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	Redacted	Redacted
101	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	3	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.079905	-159.763668
101	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	Yes	22.079905	-159.763668
101	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.079905	-159.763668
102	Hawaiian Yellow-faced Bee	*Hylaeus* sp.	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	No	Redacted	Redacted
102	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	Yes	22.074666	-159.768765
103	Feral Cat	*Felis catus*	Good	Adult	3	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.074023	-159.768142
103	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.074023	-159.768142
103	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.074023	-159.768142
103	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	Yes	22.074023	-159.768142
103	Barn Owl	*Tyto alba*	Deceased	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.073974	-159.767907
104	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	No	22.071713	-159.767163
104	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	No	22.071713	-159.767163
104	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	Yes	22.071713	-159.767163
104	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	No	22.071713	-159.767163
105	Common Myna	*Acridotheres tristis*	Good	Adult	3	NA	NA	Active fallow agricultural land	No	22.075101	-159.763184
105	Zebra Dove	*Geopelia striata*	Good	Adult	70	NA	NA	Active fallow agricultural land	No	22.075101	-159.763184
105	Warbling White-eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Active fallow agricultural land	No	22.075101	-159.763184
105	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	4	NA	NA	Active fallow agricultural land	Yes	22.075101	-159.763184
105	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	5	NA	NA	Active fallow agricultural land	No	22.075101	-159.763184

[1] This report has been redacted to prevent disclosure of information about the location of special status species.

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
105	House Finch	*Haemorhous mexicanus*	Good	Adult	8	NA	NA	Active fallow agricultural land	Yes	22.075101	-159.763184
106	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Irrigation canal, kiawe and koa haole scrub	No	22.068686	-159.767794
106	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Irrigation canal, kiawe and koa haole scrub	No	22.068686	-159.767794
106	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Irrigation canal, kiawe and koa haole scrub	Yes	22.068686	-159.767794
107	Warbling White-eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Active fallow agricultural land	No	22.071403	-159.761955
108	Common Waxbill	*Estrilda astrild*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.071096	-159.756946
108	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.071096	-159.756946
108	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	Yes	22.071096	-159.756946
108	Feral Goat	*Capra hircus*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.071096	-159.756946
109	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.064991	-159.766104
109	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.064991	-159.766104
109	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	1	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.064991	-159.766104
109	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.064991	-159.766104
109	Great Frigatebird	*Fregata minor*	Good	Adult	1	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	Yes	22.064991	-159.766104
109	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	12	Threatened	Endangered	Kiawe and koa haole, dry ditch, side drainage with water	Yes	Redacted	Redacted
110	Common Waxbill	*Estrilda astrild*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.064191	-159.758532
110	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.064191	-159.758532
110	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.064191	-159.758532
110	White-tailed Tropicbird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	Yes	22.064191	-159.758532
110	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.064191	-159.758532
110	Feral Goat	*Capra hircus*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.064191	-159.758532
111	Grey Francolin	*Ortygornis pondicerianus*	Good	Adult	3	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
111	Feral Goat	*Capra hircus*	Good	Adult	1	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
111	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
111	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	Yes	22.061575	-159.758805
111	Common Waxbill	*Estrilda astrild*	Good	Adult	5	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
111	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
111	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
111	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	3	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.061575	-159.758805
112	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	Yes	22.055048	-159.764327
112	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.055048	-159.764327
112	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.055048	-159.764327
112	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	Yes	22.055048	-159.764327
112	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.055048	-159.764327
113	Common Waxbill	*Estrilda astrild*	Good	Adult	12	NA	NA	Actively cultivated agricultural land, fallow	No	22.050582	-159.767817
113	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	10	Threatened	Endangered	Actively cultivated agricultural land, fallow	Yes	Redacted	Redacted
113	Rock Pigeon	*Columba livia*	Good	Adult	4	NA	NA	Actively cultivated agricultural land, fallow	No	22.050582	-159.767817
113	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	3	NA	NA	Actively cultivated agricultural land, fallow	Yes	22.050582	-159.767817
113	Cattle Egret	*Bubulcus ibis*	Good	Adult	300	NA	NA	Actively cultivated agricultural land, fallow	Yes	22.050582	-159.767817
113	Hawaiian Short-eared Owl	*Asio flammeus sandwichensis*	Good	Adult	3	NA	NA	Actively cultivated agricultural land, fallow	Yes	Redacted	Redacted
113	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Actively cultivated agricultural land, fallow	No	22.050582	-159.767817
113	Common Myna	*Acridotheres tristis*	Good	Adult	9	NA	NA	Actively cultivated agricultural land, fallow	No	22.050582	-159.767817
114	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	2	NA	NA	Kiawe koa haole scrub, dry, no path or access	Yes	22.048318	-159.770356
114	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	Yes	22.048318	-159.770356

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
114	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.048318	-159.770356
114	Warbling White-eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.048318	-159.770356
114	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.048318	-159.770356
114	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	Yes	22.048318	-159.770356
114	Java Sparrow	*Padda oryzivora*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.048318	-159.770356
114	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	Yes	22.048318	-159.770356
114	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.048318	-159.770356
115	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	6	NA	NA	Dry canal, papyrus weed, koa haole scrub	No	22.053836	-159.776477
115	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	2	NA	NA	Dry canal, papyrus weed, koa haole scrub	Yes	22.053836	-159.776477
115	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Dry canal, papyrus weed, koa haole scrub	No	22.053836	-159.776477
115	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Dry canal, papyrus weed, koa haole scrub	No	22.053836	-159.776477
115	African Silverbill	*Euodice cantans*	Good	Adult	1	NA	NA	Dry canal, papyrus weed, koa haole scrub	No	22.053836	-159.776477
116	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Agricultural fallow field	No	22.043526	-159.772066
116	African Silverbill	*Euodice cantans*	Good	Adult	2	NA	NA	Agricultural fallow field	No	22.043526	-159.772066
116	Warbling White-eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Agricultural fallow field	No	22.043526	-159.772066
116	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Agricultural fallow field	No	22.043526	-159.772066
116	Scaly-breasted Munia	*Lonchura punctulata*	Good	Adult	5	NA	NA	Agricultural fallow field	No	22.043526	-159.772066
117	Cattle Egret	*Bubulcus ibis*	Good	Adult	10	NA	NA	Agricultural fields	Yes	22.042918	-159.766887
117	Spotted Dove	*Spilopelia chinensis*	Good	Adult	5	NA	NA	Agricultural fields	No	22.042918	-159.766887
117	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	4	NA	NA	Agricultural fields	No	22.042918	-159.766887
118	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	4	Threatened	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
118	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	3	Endangered	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
118	Hawaiian Coot	*Fulica alai*	Good	Adult	1	Endangered	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
118	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	23	Threatened	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
118	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.044356	-159.760537
118	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	Yes	22.044356	-159.760537
118	Common Myna	*Acridotheres tristis*	Good	Adult	4	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.044356	-159.760537
118	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
118	Hawaiian Short-eared Owl	*Asio flammeus sandwichensis*	Good	Adult	1	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
119	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	Yes	22.039792	-159.760346
119	African Silverbill	*Euodice cantans*	Good	Adult	5	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Feral Pig	*Sus scrofa*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	Yes	22.039792	-159.760346
119	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	3	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Red Junglefowl	*Gallus gallus*	Good	Adult	3	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	Grey Francolin	*Ortygornis pondicerianus*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
119	House Sparrow	*Passer domesticus*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.039792	-159.760346
120	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.040406	-159.754166
120	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.040406	-159.754166
120	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	2	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.040406	-159.754166
121	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Koa haole scrubland	No	22.037038	-159.754687
121	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Koa haole scrubland	Yes	22.037038	-159.754687
122	Great Frigatebird	*Fregata minor*	Good	Adult	1	NA	NA	Dry reservoir	Yes	22.031914	-159.757611
122	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Dry reservoir	No	22.031914	-159.757611

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
123	Cattle Egret	*Bubulcus ibis*	Good	Adult	6	NA	NA	Agricultural field	Yes	22.033104	-159.763953
123	Spotted Dove	*Spilopelia chinensis*	Good	Adult	6	NA	NA	Agricultural field	No	22.033104	-159.763953
123	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Agricultural field	No	22.033104	-159.763953
124	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.032901	-159.771757
124	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.032901	-159.771757
124	Cattle Egret	*Bubulcus ibis*	Good	Adult	7	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.032901	-159.771757
124	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	3	Endangered	Endangered	Sand quarry, ponded water with scrub vegetation	Yes	Redacted	Redacted
124	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.032901	-159.771757
124	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	1	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.032901	-159.771757
124	African Silverbill	*Euodice cantans*	Good	Adult	16	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.032901	-159.771757
125	Scaly-breasted Munia	*Lonchura punctulata*	Good	Adult	4	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	No	22.030747	-159.773771
125	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	No	22.030747	-159.773771
125	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	No	22.030747	-159.773771
126	Warbling White-eye	*Zosterops japonicus*	Good	Adult	11	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.017754	-159.76354
126	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Fallow agricultural kiawe, koa haole scrub	Yes	22.017754	-159.76354
126	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.017754	-159.76354
126	Rock Pigeon	*Columba livia*	Good	Adult	4	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.017754	-159.76354
127	Hawaiian Coot	*Fulica alai*	Good	Adult	5	Endangered	Endangered	Irrigation canal, kiawe/koa haole scrub	Yes	Redacted	Redacted
127	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Irrigation canal, kiawe/koa haole scrub	Yes	Redacted	Redacted
127	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	1	NA	NA	Irrigation canal, kiawe/koa haole scrub	Yes	22.012654	-159.776645
127	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.012654	-159.776645
128	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.080443	-159.761107
128	Moth Skink	*Lipinia noctua*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.080443	-159.761107
128	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.080443	-159.761107

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
128	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.080443	-159.761107
129	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Irrigation canal, kiawe/koa haole scrub	Yes	22.037341	-159.779977
129	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.037341	-159.779977
130	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	2	NA	NA	Koa haole and kiawe scrub along irrigation canal	Yes	22.035223	-159.780203
130	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Koa haole and kiawe scrub along irrigation canal	Yes	22.035223	-159.780203
130	House Sparrow	*Passer domesticus*	Good	Adult	3	NA	NA	Koa haole and kiawe scrub along irrigation canal	No	22.035223	-159.780203
130	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Koa haole and kiawe scrub along irrigation canal	No	22.035223	-159.780203
131	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.030548	-159.780079
131	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.030548	-159.780079
132	African Silverbill	*Euodice cantans*	Good	Adult	2	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.025876	-159.781842
132	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	Yes	22.025876	-159.781842
132	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Threatened	Endangered	Irrigation canal, koa haole scrub on banks	Yes	Redacted	Redacted
132	Warbling White-eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.025876	-159.781842
133	Hawaiian Short-eared Owl	*Asio flammeus sandwichensis*	Good	Adult	1	NA	NA	Mowed grass and kiawe-koa haole	Yes	Redacted	Redacted
133	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	5	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	No	22.016005	-159.781408
133	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	22.016005	-159.781408
133	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	3	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	22.016005	-159.781408
133	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	No	22.016005	-159.781408

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
133	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	No	22.016005	-159.781408
133	Hawaiian Coot	*Fulica alai*	Good	Adult	3	Endangered	Endangered	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	Redacted	Redacted
133	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	22.016005	-159.781408
133	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	4	NA	NA	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	No	22.016005	-159.781408
133	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	Redacted	Redacted
133	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	1	Endangered	Endangered	Maintained turf near airfield, with irrigation canal containing stagnant water. Koa haole and kiawe scrub adjacent to point	Yes	Redacted	Redacted
134	Grey Francolin	*Ortygornis pondicerianus*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.020817	-159.776396
134	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.020817	-159.776396
134	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.020817	-159.776396
134	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	3	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
134	African Silverbill	*Euodice cantans*	Good	Adult	4	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.020817	-159.776396
135	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	3	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.022254	-159.774708
135	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	1	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
135	Warbling White-eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.022254	-159.774708
135	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.022254	-159.774708
136	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.021109	-159.772135

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
136	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	1	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
136	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
136	African Silverbill	*Euodice cantans*	Good	Adult	3	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.021109	-159.772135
137	Donkey	*Equus asinus*	Good	Adult	1	NA	NA	Fallow field, unmanaged land	No	22.019384	-159.767604
137	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Threatened	Endangered	Fallow field, unmanaged land	Yes	Redacted	Redacted
137	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Fallow field, unmanaged land	Yes	22.019384	-159.767604
137	Warbling White-eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Fallow field, unmanaged land	No	22.019384	-159.767604
137	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Fallow field, unmanaged land	Yes	22.019384	-159.767604
138	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Kiawe and koa haole scrub	No	22.019104	-159.765084
138	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub	No	22.019104	-159.765084
138	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub	No	22.019104	-159.765084
139	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Kiawe, koa haole scrub, irrigation canal	No	22.022656	-159.763783
140	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Kiawe scrub, guinea grass	No	22.026696	-159.757563
140	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe scrub, guinea grass	No	22.026696	-159.757563
141	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	30	Threatened	Endangered	Reservoir	Yes	Redacted	Redacted
141	Hawaiian Coot	*Fulica alai*	Good	Adult	4	Endangered	Endangered	Reservoir	Yes	Redacted	Redacted
141	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Reservoir	Yes	Redacted	Redacted
141	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Reservoir	Yes	22.023442	-159.753029
141	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Reservoir	Yes	Redacted	Redacted
141	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Reservoir	Yes	22.023442	-159.753029
142	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.020896	-159.752939
142	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.020896	-159.752939
142	Warbling White-eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.020896	-159.752939
142	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.020896	-159.752939

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
142	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Scrub grassland, koa haole and kiawe scrub	Yes	22.020896	-159.752939
143	Feral Goat	*Capra hircus*	Good	Adult	11	NA	NA	Koa haole scrub land	No	22.020937	-159.750121
143	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Koa haole scrub land	No	22.020937	-159.750121
143	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Koa haole scrub land	Yes	22.020937	-159.750121
143	Warbling White-eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Koa haole scrub land	No	22.020937	-159.750121
144	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Kiawe scrub, guinea grass	No	22.019041	-159.754934
144	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Kiawe scrub, guinea grass	No	22.019041	-159.754934
145	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Fallow agricultural field	Yes	22.021861	-159.757327
145	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Fallow agricultural field	No	22.021861	-159.757327
145	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Fallow agricultural field	No	22.021861	-159.757327
145	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Fallow agricultural field	No	22.021861	-159.757327
145	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Fallow agricultural field	No	22.021861	-159.757327
146	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	8	Threatened	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	2	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	1	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.015688	-159.766786
146	Spotted Dove	*Spilopelia chinensis*	Good	Adult	7	NA	NA	Unleased land, fallow field, irrigation canal	No	22.015688	-159.766786
146	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.015688	-159.766786
146	Hawaiian Coot	*Fulica alai*	Good	Adult	2	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	3	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
147	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Threatened	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	Yes	22.017072	-159.774013
147	Hawaiian Coot	*Fulica alai*	Good	Adult	2	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Common Waxbill	*Estrilda astrild*	Good	Adult	6	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.017072	-159.774013

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
147	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	2	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.017072	-159.774013
147	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.017072	-159.774013
147	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.017072	-159.774013
147	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.017072	-159.774013
147	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	2	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
148	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	2	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Flooded land	Yes	22.01287	-159.763573
148	Hawaiian Coot	*Fulica alai*	Good	Adult	3	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Flooded land	Yes	22.01287	-159.763573
148	Rock Pigeon	*Columba livia*	Good	Adult	18	NA	NA	Flooded land	No	22.01287	-159.763573
148	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	8	Threatened	Endangered	Flooded land	Yes	Redacted	Redacted
148	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Flooded land	Yes	22.01287	-159.763573
149	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Flooded land	Yes	22.009594	-159.760129
149	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	2	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
149	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Flooded land	Yes	22.009594	-159.760129
149	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Flooded land	Yes	22.009594	-159.760129
150	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	3	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	5	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Irrigation canal, unleased land	No	22.005098	-159.756795
150	House Finch	*Haemorhous mexicanus*	Good	Adult	3	NA	NA	Irrigation canal, unleased land	Yes	22.005098	-159.756795

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
150	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Threatened	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
151	Cane Toad	*Rhinella marina*	Good	Adult	4	NA	NA	Guinea grass and koa haole	No	22.005052	-159.752451
151	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Guinea grass and koa haole	Yes	22.005052	-159.752451
151	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Guinea grass and koa haole	No	22.005052	-159.752451
151	House Finch	*Haemorhous mexicanus*	Good	Adult	6	NA	NA	Guinea grass and koa haole	Yes	22.005052	-159.752451
151	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.005052	-159.752451
151	Black Francolin	*Francolinus francolinus*	Good	Adult	3	NA	NA	Guinea grass and koa haole	No	22.005052	-159.752451
151	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Guinea grass and koa haole	No	22.005052	-159.752451
152	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Agricultural field	Yes	22.007936	-159.75139
152	Black Francolin	*Francolinus francolinus*	Good	Adult	3	NA	NA	Agricultural field	No	22.007936	-159.75139
152	Java Sparrow	*Padda oryzivora*	Good	Adult	3	NA	NA	Agricultural field	No	22.007936	-159.75139
152	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Agricultural field	No	22.007936	-159.75139
152	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	10	Threatened	Endangered	Agricultural field	Yes	Redacted	Redacted
152	Zebra Dove	*Geopelia striata*	Good	Adult	8	NA	NA	Agricultural field	No	22.007936	-159.75139
152	Rock Pigeon	*Columba livia*	Good	Adult	21	NA	NA	Agricultural field	No	22.007936	-159.75139
152	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Agricultural field	No	22.007936	-159.75139
153	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Fallow field	Yes	22.010985	-159.752318
153	House Finch	*Haemorhous mexicanus*	Good	Adult	12	NA	NA	Fallow field	Yes	22.010985	-159.752318
153	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Fallow field	No	22.010985	-159.752318
153	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Fallow field	No	22.010985	-159.752318
154	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Fallow field, uncultivated, guinea grass	No	22.012963	-159.754787
154	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Fallow field, uncultivated, guinea grass	Yes	22.012963	-159.754787
154	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Fallow field, uncultivated, guinea grass	No	22.012963	-159.754787
155	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	5	Endangered	Endangered	Reservoir, guinea grass, monkey pod	Yes	Redacted	Redacted
155	Common Myna	*Acridotheres tristis*	Good	Adult	12	NA	NA	Reservoir, guinea grass, monkey pod	No	22.008833	-159.745956
155	Warbling White-eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Reservoir, guinea grass, monkey pod	No	22.008833	-159.745956
155	Zebra Dove	*Geopelia striata*	Good	Adult	7	NA	NA	Reservoir, guinea grass, monkey pod	No	22.008833	-159.745956

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
156	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Koa haole, kiawe, guinea grass scrub	No	22.01007	-159.744501
156	Common Waxbill	*Estrilda astrild*	Good	Adult	2	NA	NA	Koa haole, kiawe, guinea grass scrub	No	22.01007	-159.744501
156	Warbling White-eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Koa haole, kiawe, guinea grass scrub	No	22.01007	-159.744501
157	Java Sparrow	*Padda oryzivora*	Good	Adult	12	NA	NA	Guinea grass and koa haole	No	22.005785	-159.748661
157	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Guinea grass and koa haole	Yes	22.005785	-159.748661
157	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.005785	-159.748661
157	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.005785	-159.748661
157	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Guinea grass and koa haole	No	22.005785	-159.748661
157	Warbling White-eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Guinea grass and koa haole	No	22.005785	-159.748661
158	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Agricultural field	Yes	22.006573	-159.760479
158	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Agricultural field	No	22.006573	-159.760479
158	Rock Pigeon	*Columba livia*	Good	Adult	3	NA	NA	Agricultural field	No	22.006573	-159.760479
158	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Agricultural field	No	22.006573	-159.760479
159	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	6	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	Yes	22.001922	-159.761726
159	Common Myna	*Acridotheres tristis*	Good	Adult	12	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.001922	-159.761726
159	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.001922	-159.761726
159	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	Yes	22.001922	-159.761726
159	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.001922	-159.761726
160	Great Frigatebird	*Fregata minor*	Good	Adult	1	NA	NA	Agricultural field	Yes	21.998388	-159.754505
160	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Agricultural field	Yes	21.998388	-159.754505
160	Rock Pigeon	*Columba livia*	Good	Adult	8	NA	NA	Agricultural field	No	21.998388	-159.754505
160	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Agricultural field	No	21.998388	-159.754505
160	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Agricultural field	No	21.998388	-159.754505
160	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Agricultural field	Yes	21.998388	-159.754505
161	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Ditch with koa haole	Yes	22.000107	-159.750996
161	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Ditch with koa haole	No	22.000107	-159.750996
161	Rock Pigeon	*Columba livia*	Good	Adult	2	NA	NA	Ditch with koa haole	No	22.000107	-159.750996

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
161	Common Myna	*Acridotheres tristis*	Good	Adult	8	NA	NA	Ditch with koa haole	No	22.000107	-159.750996
161	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Ditch with koa haole	Yes	22.000107	-159.750996
161	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Ditch with koa haole	Yes	Redacted	Redacted
162	Cattle Egret	*Bubulcus ibis*	Good	Adult	57	NA	NA	Agricultural land and koa haole	Yes	22.000353	-159.742549
162	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Agricultural land and koa haole	No	22.000353	-159.742549
162	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Agricultural land and koa haole	No	22.000353	-159.742549
162	House Finch	*Haemorhous mexicanus*	Good	Adult	3	NA	NA	Agricultural land and koa haole	Yes	22.000353	-159.742549
162	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Agricultural land and koa haole	No	22.000353	-159.742549
163	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Grass and koa haole	No	22.000017	-159.739938
163	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Grass and koa haole	Yes	22.000017	-159.739938
163	House Finch	*Haemorhous mexicanus*	Good	Adult	4	NA	NA	Grass and koa haole	Yes	22.000017	-159.739938
163	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	1	NA	NA	Grass and koa haole	No	22.000017	-159.739938
164	House Finch	*Haemorhous mexicanus*	Good	Adult	6	NA	NA	Ditch, kiawe, and koa haole	Yes	22.000627	-159.736323
164	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	1	Endangered	Endangered	Ditch, kiawe, and koa haole	Yes	Redacted	Redacted
165	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Kiawe and koa haole	No	21.999328	-159.737248
165	White-rumped Shama	*Copsychus malabaricus*	Good	Adult	2	NA	NA	Kiawe and koa haole	No	21.999328	-159.737248
165	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe and koa haole	No	21.999328	-159.737248
166	Cattle Egret	*Bubulcus ibis*	Good	Adult	12	NA	NA	Agricultural field	Yes	21.99631	-159.741109
166	Common Waxbill	*Estrilda astrild*	Good	Adult	4	NA	NA	Agricultural field	No	21.99631	-159.741109
166	Zebra Dove	*Geopelia striata*	Good	Adult	9	NA	NA	Agricultural field	No	21.99631	-159.741109
166	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Agricultural field	No	21.99631	-159.741109
167	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Guinea grass, koa haole, ditch	Yes	21.994865	-159.745839
167	Warbling White-eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Guinea grass, koa haole, ditch	No	21.994865	-159.745839
167	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Guinea grass, koa haole, ditch	No	21.994865	-159.745839
167	Black-tailed Deer	*Odocoileus hemionus hemionus*	Good	Adult	1	NA	NA	Guinea grass, koa haole, ditch	No	21.994865	-159.745839
168	Cattle Egret	*Bubulcus ibis*	Good	Adult	13	NA	NA	Agricultural field and koa haole	Yes	21.99421	-159.748654
168	Great Frigatebird	*Fregata minor*	Good	Adult	1	NA	NA	Agricultural field and koa haole	Yes	21.99421	-159.748654

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude[1]	Longitude
168	Common Myna	*Acridotheres tristis*	Good	Adult	24	NA	NA	Agricultural field and koa haole	No	21.99421	-159.748654
168	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	1	NA	NA	Agricultural field and koa haole	Yes	21.99421	-159.748654
168	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Agricultural field and koa haole	No	21.99421	-159.748654
168	Spotted Dove	*Spilopelia chinensis*	Good	Adult	4	NA	NA	Agricultural field and koa haole	No	21.99421	-159.748654
168	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Agricultural field and koa haole	No	21.99421	-159.748654
169	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Kiawe, koa haole scrub, ditch	No	22.027333	-159.765519
169	African Silverbill	*Euodice cantans*	Good	Adult	2	NA	NA	Kiawe, koa haole scrub, ditch	No	22.027333	-159.765519
170	White-tailed Tropicbird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	Yes	22.067301	-159.754847
171	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	5	Threatened	Endangered	Flooded land	Yes	Redacted	Redacted
171	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	4	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
171	Cattle Egret	*Bubulcus ibis*	Good	Adult	5	NA	NA	Flooded land	Yes	22.010633	-159.761177
171	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	3	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
171	Hawaiian Coot	*Fulica alai*	Good	Adult	1	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
171	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
171	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Flooded land	Yes	22.010633	-159.761177
171	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Flooded land	Yes	22.010633	-159.761177
171	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	4	NA	NA	Flooded land	No	22.010633	-159.761177
172	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	2	NA	NA	Flooded land	Yes	22.005919	-159.756648
172	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	3	NA	NA	Flooded land	Yes	22.005919	-159.756648
172	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	6	Threatened	Endangered	Flooded land	Yes	Redacted	Redacted
172	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	3	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
172	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
172	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	8	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
172	Common Myna	*Acridotheres tristis*	Good	Adult	4	NA	NA	Flooded land	No	22.005919	-159.756648

Observation Point ID	***Common Name***	***Scientific Name***	***Health Condition***	***Life Stage***	***Number Observed***	***ESA Status***	***State Status***	***Vegetation/Habitat***	***MBTA Species (Yes/No)***	***Latitude[1]***	***Longitude***
173	Black-crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Ditch, Guinea grass and koa haole	Yes	22.003239	-159.753801
173	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Ditch, Guinea grass and koa haole	Yes	Redacted	Redacted
174	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Threatened	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted
174	Hawaiian Coot	*Fulica alai*	Good	Adult	3	Endangered	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted
174	Wandering Tattler	*Tringa incana*	Good	Adult	2	NA	NA	Large open water, koa haole scrub, wetland fringe	Yes	22.036699	-159.778251
300	Warbling White-eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Pines and lantana	No	22.12606	-159.717367
300	House Finch	*Haemorhous mexicanus*	Good	Adult	1	NA	NA	Pines and lantana	Yes	22.12606	-159.717367
300	Red-crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Pines and lantana	No	22.12606	-159.717367
301	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Pine, silky oak, lantana	No	22.126048	-159.71768
302	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.137896	-159.717534
302	Warbling White-eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Swollenfinger grass and pines	No	22.137896	-159.717534
302	White-tailed Tropicbird	*Phaethon lepturus*	Good	Adult	3	NA	NA	Steep rocky cliffs	Yes	22.137896	-159.717534
303	House Finch	*Haemorhous mexicanus*	Good	Adult	3	NA	NA	Swollenfinger grass and pines	Yes	22.138847	-159.718733
303	Warbling White-eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Swollenfinger grass and pines	No	22.138847	-159.718733
304	Warbling White-eye	*Zosterops japonicus*	Good	Adult	10	NA	NA	Swollenfinger grass and pines	No	22.138934	-159.719149
304	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.138934	-159.719149

Table B-2. Field Survey Event 2 Data Matrix

Observation Point ID	*Common Name*	*Scientific Name*	*Health Condition*	*Life Stage*	*Number Observed*	*ESA Status*	*State Status*	*Vegetation/Habitat*	*MBTA Species (Yes/No)*	*Latitude*	*Longitude*
101	African Silverbill	*Euodice cantans*	Good	Adult	1	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.07983447	-159.7635997
101	House Sparrow	*Passer domesticus*	Good	Adult	2	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.07983447	-159.7635997
101	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	5	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.07983447	-159.7635997
101	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	Yes	22.07983447	-159.7635997
101	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.07983447	-159.7635997
101	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Sand dunes, coastal scrub, naupaka/koa haole/kiawe dominant	No	22.07983447	-159.7635997
102	House Finch	*Haemorhous mexicanus*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	Yes	22.07465773	-159.7686571
102	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	Yes	22.07465773	-159.7686571
102	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	No	22.07465773	-159.7686571
102	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	No	22.07465773	-159.7686571
102	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	No	22.07465773	-159.7686571
102	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Sand dunes, koa haole and kiawe low scrubland	No	22.07465773	-159.7686571
103	House Sparrow	*Passer domesticus*	Good	Adult	2	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.07403606	-159.7681494
103	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.07403606	-159.7681494
103	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.07403606	-159.7681494
103	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.07403606	-159.7681494
103	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Koa haole and kiawe forest, dirt/sand road	No	22.07403606	-159.7681494
104	House Finch	*Haemorhous mexicanus*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	Yes	22.07175101	-159.7671439
104	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	Yes	22.07175101	-159.7671439
104	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Koa haole dominated scrubland	No	22.07175101	-159.7671439
104	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Koa haole dominated scrubland	No	22.07175101	-159.7671439

Observation Point ID	***Common Name***	***Scientific Name***	***Health Condition***	***Life Stage***	***Number Observed***	***ESA Status***	***State Status***	***Vegetation/Habitat***	***MBTA Species (Yes/No)***	***Latitude***	***Longitude***
105	African Silverbill	*Euodice cantans*	Good	Adult	25	NA	NA	Active and fallow agricultural land	No	22.07504884	-159.7631649
105	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	25	NA	NA	Active and fallow agricultural land	No	22.07504884	-159.7631649
105	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	11	NA	NA	Active and fallow agricultural land	Yes	22.07504884	-159.7631649
105	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Active and fallow agricultural land	No	22.07504884	-159.7631649
105	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Active and fallow agricultural land	No	22.07504884	-159.7631649
105	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Active and fallow agricultural land	No	22.07504884	-159.7631649
106	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Irrigation canal, kiawe and koa haole scrub	Yes	22.06860061	-159.7677718
106	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Irrigation canal, kiawe and koa haole scrub	No	22.06860061	-159.7677718
106	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Irrigation canal, kiawe and koa haole scrub	No	22.06860061	-159.7677718
107	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Active and fallow agricultural land	Yes	22.07131318	-159.762032
107	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Active and fallow agricultural land	No	22.07131318	-159.762032
107	House Finch	*Haemorhous mexicanus*	Good	Adult	5	NA	NA	Active and fallow agricultural land	Yes	22.07131318	-159.762032
107	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Active and fallow agricultural land	Yes	22.07131318	-159.762032
107	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Active and fallow agricultural land	No	22.07131318	-159.762032
107	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Active and fallow agricultural land	No	22.07131318	-159.762032
107	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Active and fallow agricultural land	No	22.07131318	-159.762032
107	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Active and fallow agricultural land	No	22.07131318	-159.762032
108	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	Yes	22.07109512	-159.7568651
108	Common Myna	*Acridotheres tristis*	Good	Adult	10	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	No	22.07109512	-159.7568651
108	Feral Goat	*Capra hircus*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	No	22.07109512	-159.7568651
108	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	Yes	22.07109512	-159.7568651
108	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	No	22.07109512	-159.7568651
108	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	No	22.07109512	-159.7568651
108	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Steep rocky cliffs, adjacent to active fallow agricultural land	No	22.07109512	-159.7568651

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
109	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	Yes	22.06508444	-159.76612
109	House Sparrow	*Passer domesticus*	Good	Adult	4	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.06508444	-159.76612
109	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	5	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	Yes	22.06508444	-159.76612
109	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	180	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.06508444	-159.76612
109	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.06508444	-159.76612
109	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Kiawe and koa haole, dry ditch, side drainage with water	No	22.06508444	-159.76612
110	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	Yes	22.06428671	-159.7584011
110	Feral Goat	*Capra hircus*	Good	Adult	3	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
110	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
110	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
110	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	Yes	22.06428671	-159.7584011
110	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
110	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
110	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Steep rocky cliffs, adjacent to active and fallow agricultural land	No	22.06428671	-159.7584011
111	Cattle Egret	*Bubulcus ibis*	Good	Adult	23	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	Yes	22.06152848	-159.7589066
111	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Reservoir, scrub habitat, hau thicket, irrigation ditch	Yes	Redacted	Redacted
111	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Endangered	Endangered	Reservoir, scrub habitat, hau thicket, irrigation ditch	Yes	Redacted	Redacted
111	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.06152848	-159.7589066
111	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.06152848	-159.7589066
111	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	Yes	22.06152848	-159.7589066

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
111	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.06152848	-159.7589066
111	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Reservoir, scrub habitat, hau thicket, irrigation ditch	No	22.06152848	-159.7589066
112	Cattle Egret	*Bubulcus ibis*	Good	Adult	9	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	Yes	22.05468696	-159.764374
112	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	2	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.05468696	-159.764374
112	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	10	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.05468696	-159.764374
112	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.05468696	-159.764374
112	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.05468696	-159.764374
112	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Dry canal, kiawe/koa haole scrub, guinea grass, agricultural land adjacent	No	22.05468696	-159.764374
113	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Actively cultivated and fallow agricultural land	Yes	22.05036454	-159.7681726
113	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	1	Endangered	Endangered	Actively cultivated and fallow agricultural land	Yes	Redacted	Redacted
113	House Finch	*Haemorhous mexicanus*	Good	Adult	3	NA	NA	Actively cultivated and fallow agricultural land	Yes	22.05036454	-159.7681726
113	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Actively cultivated and fallow agricultural land	Yes	22.05036454	-159.7681726
113	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Actively cultivated and fallow agricultural land	No	22.05036454	-159.7681726
113	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	2	NA	NA	Actively cultivated and fallow agricultural land	No	22.05036454	-159.7681726
113	Spotted Dove	*Spilopelia chinensis*	Good	Adult	15	NA	NA	Actively cultivated and fallow agricultural land	No	22.05036454	-159.7681726
113	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	1	NA	NA	Actively cultivated and fallow agricultural land	No	22.05036454	-159.7681726
113	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Actively cultivated and fallow agricultural land	No	22.05036454	-159.7681726
114	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.0482618	-159.7703294

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
114	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	Yes	22.0482618	-159.7703294
114	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.0482618	-159.7703294
114	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.0482618	-159.7703294
114	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	3	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.0482618	-159.7703294
114	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Kiawe koa haole scrub, dry, no path or access	No	22.0482618	-159.7703294
115	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Dry ditch, papyrus weed, koa haole scrub	No	22.05378003	-159.7764138
115	House Sparrow	*Passer domesticus*	Good	Adult	5	NA	NA	Dry ditch, papyrus weed, koa haole scrub	No	22.05378003	-159.7764138
115	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Dry ditch, papyrus weed, koa haole scrub	Yes	22.05378003	-159.7764138
115	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Dry ditch, papyrus weed, koa haole scrub	No	22.05378003	-159.7764138
115	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Dry ditch, papyrus weed, koa haole scrub	No	22.05378003	-159.7764138
115	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Dry ditch, papyrus weed, koa haole scrub	No	22.05378003	-159.7764138
115	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Dry ditch, papyrus weed, koa haole scrub	Yes	22.05378003	-159.7764138
116	African Silverbill	*Euodice cantans*	Good	Adult	20	NA	NA	Agricultural fallow field	No	22.04366158	-159.7719712
116	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Agricultural fallow field	Yes	22.04366158	-159.7719712
116	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	7	Endangered	Endangered	Agricultural fallow field	Yes	Redacted	Redacted
116	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Agricultural fallow field	Yes	22.04366158	-159.7719712
116	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Agricultural fallow field	No	22.04366158	-159.7719712
116	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Agricultural fallow field	No	22.04366158	-159.7719712
116	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Agricultural fallow field	No	22.04366158	-159.7719712
117	Cane Toad	*Rhinella marina*	Good	Adult	1	NA	NA	Agricultural fields	No	22.04307442	-159.7669166
117	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Agricultural fields	Yes	22.04307442	-159.7669166
117	Common Myna	*Acridotheres tristis*	Good	Adult	9	NA	NA	Agricultural fields	No	22.04307442	-159.7669166
117	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Agricultural fields	Yes	22.04307442	-159.7669166

Observation Point ID	***Common Name***	***Scientific Name***	***Health Condition***	***Life Stage***	***Number Observed***	***ESA Status***	***State Status***	***Vegetation/Habitat***	***MBTA Species (Yes/No)***	***Latitude***	***Longitude***
117	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	20	NA	NA	Agricultural fields	No	22.04307442	-159.7669166
117	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Agricultural fields	No	22.04307442	-159.7669166
118	Cattle Egret	*Bubulcus ibis*	Good	Adult	19	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	Yes	22.04458225	-159.7612665
118	Feral Goat	*Capra hircus*	Good	Adult	2	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.04458225	-159.7612665
118	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	21	Endangered	Endangered	Reservoir, surrounded by koa haole/kiawe scrub	Yes	Redacted	Redacted
118	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.04458225	-159.7612665
118	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.04458225	-159.7612665
118	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.04458225	-159.7612665
118	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Reservoir, surrounded by koa haole/kiawe scrub	No	22.04458225	-159.7612665
119	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	Yes	22.03976394	-159.7604283
119	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.03976394	-159.7604283
119	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	Yes	22.03976394	-159.7604283
119	Red Junglefowl	*Gallus gallus*	Good	Adult	3	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.03976394	-159.7604283
119	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.03976394	-159.7604283
119	Zebra Dove	*Geopelia striata*	Good	Adult	8	NA	NA	Adjacent to mango farm, koa haole scrub, irrigation canal with water	No	22.03976394	-159.7604283
120	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.04049005	-159.7541637
120	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	Yes	22.04049005	-159.7541637
120	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.04049005	-159.7541637
120	White-Tailed Tropic Bird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	Yes	22.04049005	-159.7541637
120	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Wiliwili trees, steep rock habitat, koa haole scrubland	No	22.04049005	-159.7541637
121	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Koa haole scrubland	No	22.03690242	-159.7547605

Observation Point ID	***Common Name***	***Scientific Name***	***Health Condition***	***Life Stage***	***Number Observed***	***ESA Status***	***State Status***	***Vegetation/Habitat***	***MBTA Species (Yes/No)***	***Latitude***	***Longitude***
121	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Koa haole scrubland	No	22.03690242	-159.7547605
121	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Koa haole scrubland	No	22.03690242	-159.7547605
121	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	4	NA	NA	Koa haole scrubland	No	22.03690242	-159.7547605
122	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Dry reservoir	Yes	22.03175036	-159.7577246
122	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Dry reservoir	No	22.03175036	-159.7577246
122	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Dry reservoir	No	22.03175036	-159.7577246
122	Zebra Dove	*Geopelia striata*	Good	Adult	6	NA	NA	Dry reservoir	No	22.03175036	-159.7577246
123	Cattle Egret	*Bubulcus ibis*	Good	Adult	10	NA	NA	Agricultural field	Yes	22.0329723	-159.763853
123	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	20	NA	NA	Agricultural field	No	22.0329723	-159.763853
123	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Agricultural field	No	22.0329723	-159.763853
123	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Agricultural field	No	22.0329723	-159.763853
123	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Agricultural field	No	22.0329723	-159.763853
123	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Agricultural field	No	22.0329723	-159.763853
124	African Silverbill	*Euodice cantans*	Good	Adult	20	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
124	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.03286791	-159.7717564
124	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.03286791	-159.7717564
124	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	1	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
124	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
124	Common Waxbill	*Estrilda astrild*	Good	Adult	80	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
124	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	2	Endangered	Endangered	Sand quarry, ponded water with scrub vegetation	Yes	Redacted	Redacted
124	Hawaiian Short-Eared Owl	*Asio flammeus sandwichensis*	Good	Adult	1	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	Redacted	Redacted
124	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.03286791	-159.7717564
124	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	3	NA	NA	Sand quarry, ponded water with scrub vegetation	Yes	22.03286791	-159.7717564
124	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
124	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
124	Zebra Dove	*Geopelia striata*	Good	Adult	25	NA	NA	Sand quarry, ponded water with scrub vegetation	No	22.03286791	-159.7717564
125	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	Yes	22.03072611	-159.7736248
125	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	No	22.03072611	-159.7736248
125	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Unmanaged open grass/koa haole kiawe scrub land adjacent to sand pit	No	22.03072611	-159.7736248
126	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	5	Endangered	Endangered	Fallow agricultural kiawe, koa haole scrub	Yes	Redacted	Redacted
126	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	2	Endangered	Endangered	Fallow agricultural kiawe, koa haole scrub	Yes	Redacted	Redacted
126	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Fallow agricultural kiawe, koa haole scrub	Yes	22.01808202	-159.7640655
126	African Silverbill	*Euodice cantans*	Good	Adult	3	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.01808202	-159.7640655
126	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Fallow agricultural kiawe, koa haole scrub	Yes	22.01808202	-159.7640655
126	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.01808202	-159.7640655
126	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Fallow agricultural kiawe, koa haole scrub	No	22.01808202	-159.7640655
127	African Silverbill	*Euodice cantans*	Good	Adult	3	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.01253999	-159.7768534
127	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	3	NA	NA	Irrigation canal, kiawe/koa haole scrub	Yes	22.01253999	-159.7768534
127	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Irrigation canal, kiawe/koa haole scrub	Yes	22.01253999	-159.7768534
127	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	4	Endangered	Endangered	Irrigation canal, kiawe/koa haole scrub	Yes	Redacted	Redacted
127	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Endangered	Endangered	Irrigation canal, kiawe/koa haole scrub	Yes	Redacted	Redacted
127	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.01253999	-159.7768534
127	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.01253999	-159.7768534
128	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.0802767	-159.761311
128	House Finch	*Haemorhous mexicanus*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	Yes	22.0802767	-159.761311
128	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Koa haole and kiawe forest, sand dune slope	Yes	22.0802767	-159.761311

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
128	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.0802767	-159.761311
128	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.0802767	-159.761311
128	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.0802767	-159.761311
128	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Koa haole and kiawe forest, sand dune slope	No	22.0802767	-159.761311
129	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.03733631	-159.7799903
129	House Sparrow	*Passer domesticus*	Good	Adult	5	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.03733631	-159.7799903
129	Spotted Dove	*Spilopelia chinensis*	Good	Adult	5	NA	NA	Irrigation canal, kiawe/koa haole scrub	No	22.03733631	-159.7799903
130	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Koa haole and kiawe scrub along irrigation canal	No	22.03504979	-159.7802224
130	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Koa haole and kiawe scrub along irrigation canal	Yes	22.03504979	-159.7802224
130	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	3	NA	NA	Koa haole and kiawe scrub along irrigation canal	Yes	22.03504979	-159.7802224
130	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	2	NA	NA	Koa haole and kiawe scrub along irrigation canal	No	22.03504979	-159.7802224
130	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Koa haole and kiawe scrub along irrigation canal	No	22.03504979	-159.7802224
131	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	Yes	22.03052091	-159.7801199
131	House Sparrow	*Passer domesticus*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.03052091	-159.7801199
131	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	Yes	22.03052091	-159.7801199
131	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	2	NA	NA	Irrigation canal, koa haole scrub on banks	Yes	22.03052091	-159.7801199
131	Red Junglefowl	*Gallus gallus*	Good	Adult	5	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.03052091	-159.7801199
131	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.03052091	-159.7801199
132	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Irrigation canal, koa haole scrub on banks	No	22.02575435	-159.7819525
132	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	2	Endangered	Endangered	Irrigation canal, koa haole scrub on banks	Yes	Redacted	Redacted
132	Hawaiian Goose	*Branta sandvicensis*	Good	Chick	2	Endangered	Endangered	Irrigation canal, koa haole scrub on banks	Yes	Redacted	Redacted
133	Ruddy Turnstone	*Arenaria interpres*	Good	Adult	1	NA	NA	Maintained turf near airfield, with irrigation ditch containing stagnant	Yes	22.01597215	-159.7813804

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
								water. Koa-haole and kiawe scrub adjacent to point			
133	Saffron Finch	*Sicalis flaveola*	Good	Adult	2	NA	NA	Maintained turf near airfield, with irrigation ditch containing stagnant water. Koa-haole and kiawe scrub adjacent to point	No	22.01597215	-159.7813804
133	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Maintained turf near airfield, with irrigation ditch containing stagnant water. Koa-haole and kiawe scrub adjacent to point	Yes	22.01597215	-159.7813804
133	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Maintained turf near airfield, with irrigation ditch containing stagnant water. Koa-haole and kiawe scrub adjacent to point	No	22.01597215	-159.7813804
134	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.02067347	-159.7764797
134	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02067347	-159.7764797
134	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02067347	-159.7764797
134	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Juvenile	1	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
135	Cattle Egret	*Bubulcus ibis*	Good	Adult	5	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.02229061	-159.7747401
135	Grey Francolin	*Ortygornis pondicerianus*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02229061	-159.7747401
135	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02229061	-159.7747401
135	Zebra Dove	*Geopelia striata*	Good	Adult	7	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02229061	-159.7747401
136	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.02096825	-159.7719946
136	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	11	Endangered	Endangered	Kiawe and koa haole scrub, irrigation canal	Yes	Redacted	Redacted
136	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Kiawe and koa haole scrub, irrigation canal	Yes	22.02096825	-159.7719946
136	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02096825	-159.7719946
136	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Kiawe and koa haole scrub, irrigation canal	No	22.02096825	-159.7719946
137	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Fallow field, unmanaged land	Yes	22.01943347	-159.7675337

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
137	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	6	Endangered	Endangered	Fallow field, unmanaged land	Yes	Redacted	Redacted
137	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Fallow field, unmanaged land	No	22.01943347	-159.7675337
137	Zebra Dove	*Geopelia striata*	Good	Adult	25	NA	NA	Fallow field, unmanaged land	No	22.01943347	-159.7675337
138	African Silverbill	*Euodice cantans*	Good	Adult	9	NA	NA	Kiawe and koa haole scrub	No	22.0190916	-159.7651063
138	Cattle Egret	*Bubulcus ibis*	Good	Adult	4	NA	NA	Kiawe and koa haole scrub	Yes	22.0190916	-159.7651063
138	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Kiawe and koa haole scrub	No	22.0190916	-159.7651063
138	Zebra Dove	*Geopelia striata*	Good	Adult	15	NA	NA	Kiawe and koa haole scrub	No	22.0190916	-159.7651063
139	Cattle Egret	*Bubulcus ibis*	Good	Adult	9	NA	NA	Kiawe, koa haole scrub, irrigation canal	Yes	22.02265428	-159.7639603
139	Spotted Dove	*Spilopelia chinensis*	Good	Adult	5	NA	NA	Kiawe, koa haole scrub, irrigation canal	No	22.02265428	-159.7639603
139	Zebra Dove	*Geopelia striata*	Good	Adult	8	NA	NA	Kiawe, koa haole scrub, irrigation canal	No	22.02265428	-159.7639603
140	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Kiawe scrub, guinea grass	Yes	22.0267624	-159.7575936
140	Common Myna	*Acridotheres tristis*	Good	Adult	3	NA	NA	Kiawe scrub, guinea grass	No	22.0267624	-159.7575936
140	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Kiawe scrub, guinea grass	Yes	22.0267624	-159.7575936
140	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Kiawe scrub, guinea grass	No	22.0267624	-159.7575936
140	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Kiawe scrub, guinea grass	No	22.0267624	-159.7575936
141	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	9	Endangered	Endangered	Reservoir	Yes	Redacted	Redacted
141	Hawaiian Coot	*Fulica alai*	Good	Adult	1	Endangered	Endangered	Reservoir	Yes	Redacted	Redacted
141	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Reservoir	No	22.02345477	-159.7529692
141	Zebra Dove	*Geopelia striata*	Good	Adult	2	NA	NA	Reservoir	No	22.02345477	-159.7529692
142	Rose-Ringed Parakeet	*Psittacula krameri*	Good	Adult	1	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.02092396	-159.7529205
142	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Scrub grassland, koa haole and kiawe scrub	Yes	22.02092396	-159.7529205
142	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.02092396	-159.7529205
142	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.02092396	-159.7529205
142	Zebra Dove	*Geopelia striata*	Good	Adult	18	NA	NA	Scrub grassland, koa haole and kiawe scrub	No	22.02092396	-159.7529205
143	Common Myna	*Acridotheres tristis*	Good	Adult	12	NA	NA	Koa hale scrub land	No	22.02086512	-159.7500873
144	Cattle Egret	*Bubulcus ibis*	Good	Adult	6	NA	NA	Kiawe scrub, guinea grass	Yes	22.01906953	-159.7550123
144	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Kiawe scrub, guinea grass	Yes	22.01906953	-159.7550123
144	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Kiawe scrub, guinea grass	No	22.01906953	-159.7550123

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
144	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Kiawe scrub, guinea grass	No	22.01906953	-159.7550123
144	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Kiawe scrub, guinea grass	No	22.01906953	-159.7550123
145	Ring-Necked Pheasant	*Phasianus colchicus*	Good	Adult	3	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Cattle Egret	*Bubulcus ibis*	Good	Adult	5	NA	NA	Fallow agricultural field	Yes	22.02184088	-159.7573248
145	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	11	Endangered	Endangered	Fallow agricultural field	Yes	Redacted	Redacted
145	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Fallow agricultural field	Yes	22.02184088	-159.7573248
145	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Rock Pigeon	*Columba livia*	Good	Adult	8	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
145	Zebra Dove	*Geopelia striata*	Good	Adult	28	NA	NA	Fallow agricultural field	No	22.02184088	-159.7573248
146	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.01575537	-159.7668283
146	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.01575537	-159.7668283
146	Common Myna	*Acridotheres tristis*	Good	Adult	5	NA	NA	Unleased land, fallow field, irrigation canal	No	22.01575537	-159.7668283
146	Hawaiian Coot	*Fulica alai*	Good	Adult	4	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	10	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	22	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	31	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	3	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.01575537	-159.7668283
146	Rock Pigeon	*Columba livia*	Good	Adult	5	NA	NA	Unleased land, fallow field, irrigation canal	No	22.01575537	-159.7668283
146	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Unleased land, fallow field, irrigation canal	No	22.01575537	-159.7668283
146	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Unleased land, fallow field, irrigation canal	No	22.01575537	-159.7668283

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
146	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Unleased land, fallow field, irrigation canal	Yes	Redacted	Redacted
146	Sanderling	*Calidris alba*	Good	Adult	5	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.01575537	-159.7668283
146	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Juvenile	1	NA	NA	Unleased land, fallow field, irrigation canal	Yes	22.01575537	-159.7668283
147	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	Yes	22.01722966	-159.7739508
147	Cane Toad	*Rhinella marina*	Good	Adult	3	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.01722966	-159.7739508
147	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	Yes	22.01722966	-159.7739508
147	Hawaiian Coot	*Fulica alai*	Good	Adult	3	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	11	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
147	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	Yes	22.01722966	-159.7739508
147	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.01722966	-159.7739508
147	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Water present, open mudflats, wetlands scrub, koa haole	No	22.01722966	-159.7739508
147	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Juvenile	3	Endangered	Endangered	Water present, open mudflats, wetlands scrub, koa haole	Yes	Redacted	Redacted
148	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	23	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	African Silverbill	*Euodice cantans*	Good	Adult	1	NA	NA	Flooded land	No	22.01299244	-159.7636238
148	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	3	NA	NA	Flooded land	Yes	22.01299244	-159.7636238
148	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Flooded land	Yes	22.01299244	-159.7636238
148	Hawaiian Coot	*Fulica alai*	Good	Adult	10	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	11	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	3	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	22	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	2	NA	NA	Flooded land	Yes	22.01299244	-159.7636238
148	Hawaiian Coot	*Fulica alai*	Good	Juvenile	2	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
148	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Juvenile	1	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
149	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	7	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
149	White-Faced Ibis	*Plegadis chihi*	Good	Adult	1	NA	NA	Flooded land	Yes	22.00997521	-159.7604176
149	Hawaiian Coot	*Fulica alai*	Good	Adult	4	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
149	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	18	Endangered	Endangered	Flooded land	Yes	Redacted	Redacted
149	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Flooded land	Yes	22.00997521	-159.7604176
149	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Flooded land	No	22.00997521	-159.7604176
150	Black Francolin	*Francolinus francolinus*	Good	Adult	2	NA	NA	Irrigation canal, unleased land	No	22.00519025	-159.7565693
150	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	3	NA	NA	Irrigation canal, unleased land	Yes	22.00519025	-159.7565693
150	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Irrigation canal, unleased land	Yes	22.00519025	-159.7565693
150	Hawaiian Coot	*Fulica alai*	Good	Adult	3	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	18	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	6	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	7	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	12	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
150	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	4	NA	NA	Irrigation canal, unleased land	Yes	22.00519025	-159.7565693
150	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Irrigation canal, unleased land	No	22.00519025	-159.7565693
150	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Irrigation canal, unleased land	No	22.00519025	-159.7565693
150	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Juvenile	1	NA	NA	Irrigation canal, unleased land	Yes	22.00519025	-159.7565693
150	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Juvenile	3	Endangered	Endangered	Irrigation canal, unleased land	Yes	Redacted	Redacted
151	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Guinea grass and koa haole	Yes	22.00508039	-159.7525084
151	Common Waxbill	*Estrilda astrild*	Good	Adult	10	NA	NA	Guinea grass and koa haole	No	22.00508039	-159.7525084
151	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.00508039	-159.7525084
151	Zebra Dove	*Geopelia striata*	Good	Adult	15	NA	NA	Guinea grass and koa haole	No	22.00508039	-159.7525084
152	Cattle Egret	*Bubulcus ibis*	Good	Adult	9	NA	NA	Agricultural field	Yes	22.00789934	-159.7513726
152	House Sparrow	*Passer domesticus*	Good	Adult	1	NA	NA	Agricultural field	No	22.00789934	-159.7513726
152	Zebra Dove	*Geopelia striata*	Good	Adult	11	NA	NA	Agricultural field	No	22.00789934	-159.7513726
153	Cattle Egret	*Bubulcus ibis*	Good	Adult	13	NA	NA	Fallow field	Yes	22.01101497	-159.7523385

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
153	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	7	Endangered	Endangered	Fallow field	Yes	Redacted	Redacted
153	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Fallow field	No	22.01101497	-159.7523385
153	Zebra Dove	*Geopelia striata*	Good	Adult	10	NA	NA	Fallow field	No	22.01101497	-159.7523385
154	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Fallow field, uncultivated, guinea grass	No	22.01292	-159.7547633
154	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	30	NA	NA	Fallow field, uncultivated, guinea grass	No	22.01292	-159.7547633
154	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Fallow field, uncultivated, guinea grass	No	22.01292	-159.7547633
154	Cattle Egret	*Bubulcus ibis*	Good	Adult	55	NA	NA	Fallow field, uncultivated, guinea grass	Yes	22.01292	-159.7547633
154	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Fallow field, uncultivated, guinea grass	No	22.01292	-159.7547633
154	Zebra Dove	*Geopelia striata*	Good	Adult	24	NA	NA	Fallow field, uncultivated, guinea grass	No	22.01292	-159.7547633
154	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	9	Endangered	Endangered	Fallow field, uncultivated, guinea grass	Yes	Redacted	Redacted
155	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	1	NA	NA	Reservoir, guinea grass, monkey pod	Yes	22.00865464	-159.7460215
155	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Reservoir, guinea grass, monkey pod	Yes	22.00865464	-159.7460215
155	Zebra Dove	*Geopelia striata*	Good	Adult	5	NA	NA	Reservoir, guinea grass, monkey pod	No	22.00865464	-159.7460215
156	Northern Mockingbird	*Mimus polyglottos*	Good	Adult	1	NA	NA	Reservoir, guinea grass, monkey pod	Yes	22.0100879	-159.744521
156	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Koa haole, kiawe, guinea grass scrub	Yes	22.0100879	-159.744521
156	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Koa haole, kiawe, guinea grass scrub	No	22.0100879	-159.744521
156	Java Sparrow	*Padda oryzivora*	Good	Adult	30	NA	NA	Koa haole, kiawe, guinea grass scrub	No	22.0100879	-159.744521
157	Erckel's Francolin	*Pternistis erckelii*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.00574893	-159.7485149
157	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Guinea grass and koa haole	Yes	22.00574893	-159.7485149
157	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Guinea grass and koa haole	No	22.00574893	-159.7485149
157	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Guinea grass and koa haole	No	22.00574893	-159.7485149
157	Zebra Dove	*Geopelia striata*	Good	Adult	9	NA	NA	Guinea grass and koa haole	No	22.00574893	-159.7485149
158	Ring-Necked Pheasant	*Phasianus colchicus*	Good	Adult	3	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Agricultural field	Yes	22.0066361	-159.7605678
158	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Agricultural field	No	22.0066361	-159.7605678

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
158	Cattle Egret	*Bubulcus ibis*	Good	Adult	9	NA	NA	Agricultural field	Yes	22.0066361	-159.7605678
158	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	3	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Common Waxbill	*Estrilda astrild*	Good	Adult	1	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	6	Endangered	Endangered	Agricultural field	Yes	Redacted	Redacted
158	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	3	NA	NA	Agricultural field	Yes	22.0066361	-159.7605678
158	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	2	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Agricultural field	No	22.0066361	-159.7605678
158	Zebra Dove	*Geopelia striata*	Good	Adult	4	NA	NA	Agricultural field	No	22.0066361	-159.7605678
159	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	13	Endangered	Endangered	Ditch, adjacent to agricultural lands, vegetation scrub	Yes	Redacted	Redacted
159	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	4	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	Yes	22.00178804	-159.7616025
159	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.00178804	-159.7616025
159	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.00178804	-159.7616025
159	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Ditch, adjacent to agricultural lands, vegetation scrub	No	22.00178804	-159.7616025
159	Hawaiian Goose	*Branta sandvicensis*	Good	Chick	3	Endangered	Endangered	Ditch, adjacent to agricultural lands, vegetation scrub	Yes	Redacted	Redacted
160	Zebra Dove	*Geopelia striata*	Good	Adult	150	NA	NA	Agricultural field	No	21.99838559	-159.7544993
160	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	39	Endangered	Endangered	Agricultural field	Yes	Redacted	Redacted
160	Cattle Egret	*Bubulcus ibis*	Good	Adult	2	NA	NA	Agricultural field	Yes	21.99838559	-159.7544993
160	Common Myna	*Acridotheres tristis*	Good	Adult	6	NA	NA	Agricultural field	No	21.99838559	-159.7544993
160	Common Waxbill	*Estrilda astrild*	Good	Adult	200	NA	NA	Agricultural field	No	21.99838559	-159.7544993
161	Rose-Ringed Parakeet	*Psittacula krameri*	Good	Adult	3	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Cattle Egret	*Bubulcus ibis*	Good	Adult	3	NA	NA	Ditch with koa haole	Yes	22.00030945	-159.7510968
161	Common Myna	*Acridotheres tristis*	Good	Adult	3	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Cow	*Bos taurus*	Good	Adult	1	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Hawaiian Coot	*Fulica alai*	Good	Adult	2	Endangered	Endangered	Ditch with koa haole	Yes	Redacted	Redacted
161	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	1	Endangered	Endangered	Ditch with koa haole	Yes	Redacted	Redacted

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
161	House Sparrow	*Passer domesticus*	Good	Adult	1	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Zebra Dove	*Geopelia striata*	Good	Adult	26	NA	NA	Ditch with koa haole	No	22.00030945	-159.7510968
161	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	4	Endangered	Endangered	Ditch with koa haole	Yes	Redacted	Redacted
162	Cane Toad	*Rhinella marina*	Good	Adult	4	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
162	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Agricultural land and koa haole	Yes	22.00032005	-159.7425099
162	Common Myna	*Acridotheres tristis*	Good	Adult	4	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
162	Common Waxbill	*Estrilda astrild*	Good	Adult	3	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
162	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
162	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
162	Zebra Dove	*Geopelia striata*	Good	Adult	11	NA	NA	Agricultural land and koa haole	No	22.00032005	-159.7425099
163	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Grass and koa haole	Yes	22.00008351	-159.7399542
163	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Grass and koa haole	Yes	22.00008351	-159.7399542
163	Scaly-Breasted Munia	*Lonchura punctulate*	Good	Adult	40	NA	NA	Grass and koa haole	No	22.00008351	-159.7399542
163	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Grass and koa haole	No	22.00008351	-159.7399542
164	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Ditch, kiawe, and koa haole	No	22.00062808	-159.7363772
164	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Ditch, kiawe, and koa haole	No	22.00062808	-159.7363772
164	Feral Pig	*Sus scrofa*	Good	Adult	2	NA	NA	Ditch, kiawe, and koa haole	No	22.00062808	-159.7363772
165	Zebra Dove	*Geopelia striata*	Good	Adult	13	NA	NA	Kiawe and koa haole	No	21.99945135	-159.7373241
166	Rose-Ringed Parakeet	*Psittacula krameri*	Good	Adult	11	NA	NA	Agricultural field	No	21.99615035	-159.7408829
166	Cattle Egret	*Bubulcus ibis*	Good	Adult	49	NA	NA	Agricultural field	Yes	21.99615035	-159.7408829
166	Chestnut Munia	*Lonchura atricapilla*	Good	Adult	70	NA	NA	Agricultural field	No	21.99615035	-159.7408829
166	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Agricultural field	No	21.99615035	-159.7408829
166	Rock Pigeon	*Columba livia*	Good	Adult	4	NA	NA	Agricultural field	No	21.99615035	-159.7408829
166	Spotted Dove	*Spilopelia chinensis*	Good	Adult	33	NA	NA	Agricultural field	No	21.99615035	-159.7408829
166	Zebra Dove	*Geopelia striata*	Good	Adult	3	NA	NA	Agricultural field	No	21.99615035	-159.7408829
167	Rose-Ringed Parakeet	*Psittacula krameri*	Good	Adult	48	NA	NA	Guinea grass, koa haole, ditch	No	21.99490839	-159.7458841
167	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	3	Endangered	Endangered	Guinea grass, koa haole, ditch	Yes	Redacted	Redacted

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
167	Hawaiian Coot	*Fulica alai*	Good	Adult	2	Endangered	Endangered	Guinea grass, koa haole, ditch	Yes	Redacted	Redacted
167	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Guinea grass, koa haole, ditch	Yes	21.99490839	-159.7458841
167	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Guinea grass, koa haole, ditch	Yes	21.99490839	-159.7458841
167	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Guinea grass, koa haole, ditch	Yes	Redacted	Redacted
167	Zebra Dove	*Geopelia striata*	Good	Adult	6	NA	NA	Guinea grass, koa haole, ditch	No	21.99490839	-159.7458841
168	Rose-Ringed Parakeet	*Psittacula krameri*	Good	Adult	79	NA	NA	Agricultural field and koa haole	No	21.99406254	-159.7484897
168	Cattle Egret	*Bubulcus ibis*	Good	Adult	25	NA	NA	Agricultural field and koa haole	Yes	21.99406254	-159.7484897
168	Common Waxbill	*Estrilda astrild*	Good	Adult	20	NA	NA	Agricultural field and koa haole	No	21.99406254	-159.7484897
168	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	13	Endangered	Endangered	Agricultural field and koa haole	Yes	Redacted	Redacted
168	Zebra Dove	*Geopelia striata*	Good	Adult	23	NA	NA	Agricultural field and koa haole	No	21.99406254	-159.7484897
169	Black Francolin	*Francolinus francolinus*	Good	Adult	1	NA	NA	Kiawe, koa haole scrub, ditch	No	22.02740185	-159.7655472
169	Cattle Egret	*Bubulcus ibis*	Good	Adult	1	NA	NA	Kiawe, koa haole scrub, ditch	Yes	22.02740185	-159.7655472
169	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Kiawe, koa haole scrub, ditch	No	22.02740185	-159.7655472
169	Pacific Golden Plover	*Pluvialis fulva*	Good	Adult	1	NA	NA	Kiawe, koa haole scrub, ditch	Yes	22.02740185	-159.7655472
169	Spotted Dove	*Spilopelia chinensis*	Good	Adult	3	NA	NA	Kiawe, koa haole scrub, ditch	No	22.02740185	-159.7655472
169	Zebra Dove	*Geopelia striata*	Good	Adult	1	NA	NA	Kiawe, koa haole scrub, ditch	No	22.02740185	-159.7655472
173	Hawaiian Duck	*Anas wyvilliana*	Good	Adult	1	Endangered	Endangered	Ditch, Guinea grass and koa haole	Yes	Redacted	Redacted
173	Hawaiian Short-Eared Owl	*Asio flammeus sandwichensis*	Good	Adult	1	NA	NA	Ditch, Guinea grass and koa haole	Yes	Redacted	Redacted
173	Java Sparrow	*Padda oryzivora*	Good	Adult	34	NA	NA	Ditch, Guinea grass and koa haole	No	22.0033046	-159.7537777
173	Red-Crested Cardinal	*Paroaria coronata*	Good	Adult	1	NA	NA	Ditch, Guinea grass and koa haole	No	22.0033046	-159.7537777
173	Spotted Dove	*Spilopelia chinensis*	Good	Adult	12	NA	NA	Ditch, Guinea grass and koa haole	No	22.0033046	-159.7537777
173	Zebra Dove	*Geopelia striata*	Good	Adult	20	NA	NA	Ditch, Guinea grass and koa haole	No	22.0033046	-159.7537777
173	Black-Crowned Night Heron	*Nycticorax nycticorax*	Good	Adult	2	NA	NA	Ditch, Guinea grass and koa haole	Yes	22.0033046	-159.7537777
173	Hawaiian Duck	*Anas wyvilliana*	Good	Juvenile	2	Endangered	Endangered	Ditch, Guinea grass and koa haole	Yes	Redacted	Redacted
174	Hawaiian Coot	*Fulica alai*	Good	Adult	4	Endangered	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted
174	Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Good	Adult	1	Endangered	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted
174	Hawaiian Goose	*Branta sandvicensis*	Good	Adult	4	Endangered	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted

Observation Point ID	Common Name	Scientific Name	Health Condition	Life Stage	Number Observed	ESA Status	State Status	Vegetation/Habitat	MBTA Species (Yes/No)	Latitude	Longitude
174	Hawaiian Stilt	*Himantopus mexicanus knudseni*	Good	Adult	2	Endangered	Endangered	Large open water, koa haole scrub, wetland fringe	Yes	Redacted	Redacted
174	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Large open water, koa haole scrub, wetland fringe	No	22.03670369	-159.7781801
174	Rock Pigeon	*Columba livia*	Good	Adult	1	NA	NA	Large open water, koa haole scrub, wetland fringe	No	22.03670369	-159.7781801
174	Spotted Dove	*Spilopelia chinensis*	Good	Adult	2	NA	NA	Large open water, koa haole scrub, wetland fringe	No	22.03670369	-159.7781801
300	Saffron Finch	*Sicalis flaveola*	Good	Adult	1	NA	NA	Pines and lantana	No	22.12603021	-159.717368
301	Saffron Finch	*Sicalis flaveola*	Good	Adult	1	NA	NA	Pine, silky oak, lantana	No	22.12621472	-159.7175943
301	Common Myna	*Acridotheres tristis*	Good	Adult	1	NA	NA	Pine, silky oak, lantana	No	22.12621472	-159.7175943
301	Northern Cardinal	*Cardinalis cardinalis*	Good	Adult	1	NA	NA	Pine, silky oak, lantana	Yes	22.12621472	-159.7175943
301	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	5	NA	NA	Pine, silky oak, lantana	No	22.12621472	-159.7175943
302	Feral Goat	*Capra hircus*	Good	Adult	4	NA	NA	Swollenfinger grass and pines	No	22.13790195	-159.7175287
302	Red Junglefowl	*Gallus gallus*	Good	Adult	2	NA	NA	Swollenfinger grass and pines	No	22.13790195	-159.7175287
302	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.13790195	-159.7175287
302	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	2	NA	NA	Swollenfinger grass and pines	No	22.13790195	-159.7175287
302	White-Tailed Tropic Bird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Steep rocky cliffs	Yes	22.13790195	-159.7175287
303	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	6	NA	NA	Swollenfinger grass and pines	No	22.13880305	-159.7187224
303	Common Myna	*Acridotheres tristis*	Good	Adult	2	NA	NA	Swollenfinger grass and pines	No	22.13880305	-159.7187224
303	White-Tailed Tropic Bird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Steep rocky cliffs	Yes	22.13880305	-159.7187224
304	Common Myna	*Acridotheres tristis*	Good	Adult	4	NA	NA	Swollenfinger grass and pines	No	22.1388909	-159.7190938
304	Feral Goat	*Capra hircus*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.1388909	-159.7190938
304	Red Junglefowl	*Gallus gallus*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.1388909	-159.7190938
304	Spotted Dove	*Spilopelia chinensis*	Good	Adult	1	NA	NA	Swollenfinger grass and pines	No	22.1388909	-159.7190938
304	Warbling White-Eye	*Zosterops japonicus*	Good	Adult	12	NA	NA	Swollenfinger grass and pines	No	22.1388909	-159.7190938
304	White-Tailed Tropic Bird	*Phaethon lepturus*	Good	Adult	1	NA	NA	Steep rocky cliffs	Yes	22.1388909	-159.7190938

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Appendix C
Complete List of Species Observations

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English Common Name	Scientific Name	Life Form
African Silverbill	*Euodice cantans*	Bird
Barn Owl	*Tyto alba*	Bird
Black Francolin	*Francolinus francolinus*	Bird
Black-crowned Night Heron	*Nycticorax nycticorax*	Bird
Black-tailed Deer	*Odocoileus hemionus hemionus*	Bird
Cane Toad	*Rhinella marina*	Amphibian
Cattle Egret	*Bubulcus ibis*	Bird
Chestnut Munia	*Lonchura atricapilla*	Bird
Common Myna	*Acridotheres tristis*	Bird
Common Waxbill	*Estrilda astrild*	Bird
Cow	*Bos taurus*	Mammal
Donkey	*Equus asinus*	Mammal
Erckel's Francolin	*Pternistis erckelii*	Bird
Feral Cat	*Felis catus*	Mammal
Feral Goat	*Capra hircus*	Mammal
Feral Pig	*Sus scrofa*	Mammal
Grey Francolin	*Ortygornis pondicerianus*	Bird
Great Frigatebird	*Fregata minor*	Bird
Hawaiian Coot	*Fulica alai*	Bird
Hawaiian Duck	*Anas wyvilliana*	Bird
Hawaiian Gallinule	*Gallinula galeata sandvicensis*	Bird
Hawaiian Goose	*Branta sandvicensis*	Bird
Hawaiian Short-eared Owl	*Asio flammeus sandwichensis*	Bird
Hawaiian Stilt	*Himantopus mexicanus knudseni*	Bird
House Finch	*Haemorhous mexicanus*	Bird
House Sparrow	*Passer domesticus*	Bird
Java Sparrow	*Padda oryzivora*	Bird
Moth Skink	*Lipinia noctua*	Reptile
Northern Cardinal	*Cardinalis cardinalis*	Bird
Northern Mockingbird	*Mimus polyglottos*	Bird
Pacific Golden Plover	*Pluvialis fulva*	Bird
Red Junglefowl	*Gallus gallus*	Bird
Red-crested Cardinal	*Paroaria coronata*	Bird
Ring-necked Pheasant	*Phasianus colchicus*	Bird
Rock Pigeon	*Columba livia*	Bird
Rose-ringed Parakeet	*Psittacula krameri*	Bird
Ruddy Turnstone	*Arenaria interpres*	Bird
Saffron Finch	*Sicalis flaveola*	Bird
Sanderling	*Calidris alba*	Bird
Scaly-breasted Munia	*Lonchura punctulata*	Bird
Spotted Dove	*Spilopelia chinensis*	Bird
Wandering Tattler	*Tringa incana*	Bird
Warbling White-eye	*Zosterops japonicus*	Bird
White-faced Ibis	*Plegadis chihi*	Bird
White-tailed Tropic Bird	*Phaethon lepturus*	Bird
White-rumped Shama	*Copsychus malabaricus*	Bird

English Common Name	Scientific Name	Life Form
Yellow-faced Bee	*Hylaeus* spp.	Insect
Zebra Dove	*Geopelia striata*	Bird

PMRF Hoary Bat Survey Report

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Final V3

Hawaiian Hoary Bat Survey Report at Pacific Missile Range Facility in Support of Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Kauaʻi, Hawaiʻi

Prepared for:

Department of the Navy

Naval Facilities Engineering Systems Command, Pacific

258 Makalapa Drive, Suite 100

Joint Base Pearl Harbor-Hickam, HI 96860-3134

Prepared under: Contract N62742-18-D-1802, Task Order N62742-22-F-0206

January 2025

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Final V3

Hawaiian Hoary Bat Survey Report in Support of Pacific Missile Range Facility and Kōke‘e Park Geophysical Observatory Real Estate Kaua‘i, Hawai‘i

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ACRONYMS AND ABBREVIATIONS

ANOVA	analysis of variance
HSD	honest significance difference
KPGO	Kōkeʻe Park Geophysical Observatory
NAVFAC	Naval Facilities Engineering Systems Command
PMRF	Pacific Missile Range Facility
SM4	Song Meter SM4BAT-FS ultrasonic acoustic recorders
Tetra Tech	Tetra Tech, Inc.

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CHAPTER 1
INTRODUCTION

1.1 BACKGROUND

This report details the results of a habitat assessment and 12 months of acoustic monitoring surveys for Hawaiian hoary bats (*Aeorestes semotus*) conducted between 1 October 2023 and 30 September 2024 at the Pacific Missile Range Facility (PMRF). This study was conducted in support of the proposed PMRF and the Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement.

Under the direction of Naval Facilities Engineering Systems Command (NAVFAC), and in accordance with the 9 September 2022 Statement of Work for Contract N62742-18-D-1802, Task Order N62742-22-F-0206, Tetra Tech, Inc. (Tetra Tech) conducted a high-level habitat assessment and acoustic monitoring surveys for Hawaiian hoary bats within identified survey area components of the PMRF and KPGO real estate study area in Kauaʻi, Hawaiʻi (Figure 1-1). Survey results will be used for future project planning, development of avoidance and minimization measures, National Environmental Policy Act analysis, Chapter 343, Hawaiʻi Revised Statutes (commonly referred as the Hawaiʻi Environmental Policy Act) analysis, and potential Endangered Species Act section 7 consultation.

Tetra Tech prepared a work plan in September 2023 outlining the proposed methodology, data management, reporting, scheduling, and personnel roles. The work plan also included results from a desktop analysis of a high-level bat habitat assessment on the potential quality of bat habitat within the study area.

1.2 PURPOSE AND OBJECTIVE OF THE SURVEY

The primary goal of these surveys is to provide crucial data on potential bat habitats, bat presence, detection rates, and patterns of nightly and seasonal activity within the four designated survey areas of the PMRF Succeeding Leases and Easements study area (Figure 1-1). The results will inform future project planning, contribute to the development of avoidance and minimization strategies, and provide analysis for the National Environmental Policy Act, Chapter 343 of the Hawaiʻi Revised Statutes (commonly referred as the Hawaiʻi Environmental Policy Act), and potential Endangered Species Act section 7 consultation.

1.3 SURVEY AREAS

Acoustic monitoring for Hawaiian hoary bats was conducted at six locations within four survey areas: Miloliʻi Ridge, Mākaha Ridge, Kamokalā Ridge, and the Mānā Plain (Figure 1-1). Acoustic monitor locations ranged in elevation from approximately 9 to 12 feet (2.7 to 3.7 meters) above sea level across the Mānā Plain, 190 feet (58 meters) above sea level on Kamokalā Ridge, 1,630 feet (497 meters) above sea level on Mākaha Ridge, and 1,780 feet (542 meters) above sea level on Miloliʻi Ridge.

Figure 1-1 Location of the Hawaiian Hoary Bat Survey Areas

1.4 SURVEY SCHEDULE AND PERSONNEL

Habitat assessment surveys were conducted in September 2023. Acoustic monitors were deployed during the last week of September 2023. Active monitoring started on 1 October 2023 and ended on 30 September 2024. Data collection and maintenance checks were conducted monthly, with the exclusion of January and September 2024. Survey activities and dates are provided in Table 1-1.

Table 1-1 Hawaiian Hoary Bat Survey Schedule

Field Activity	Dates
Bat habitat assessment site visits	September 25–27, 2023
Deploy bat acoustic recorders	September 25–27, 2023
Monthly Data collection & maintenance (November)	November 17, 2023
Monthly Data collection & maintenance (December)	December 19, 2023
Monthly data collection/ maintenance (February)	February 2, 2024
Monthly data collection/ maintenance (March)	March 1, 2024
Monthly data collection/ maintenance (April)	April 1, 2024
Monthly data collection/ maintenance (May)	May 1, 2024
Monthly data collection/ maintenance (June)	June 7, 2024
Monthly data collection/ maintenance (July)	July 16, 2024
Monthly data collection/ maintenance (August)	August 30, 2024
Monthly data collection/ remove equipment (October)	October 1–2, 2024

Tetra Tech team members that were involved in performing various project tasks related to the Hawaiian hoary bat surveys are listed in Table 1-2 along with their task-specific roles.

Table 1-2 Project Personnel for PMRF Hawaiian Hoary Bat Surveys

Role	Name
Project Manager	Eric Jensen/Susan Hurley
Principal Investigator	Christopher Todd
Biologist	Jacob Dutton
Biologist	Torrey Edell
GIS Specialist	Kristina Dick/Meg Reesor

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CHAPTER 2
HAWAIIAN HOARY BAT DESKTOP ANALYSIS

2.1 SPECIES BACKGROUND

The Hawaiian hoary bat or ʻōpeʻapeʻa is an endangered endemic mammal found in the Hawaiian archipelago. Although no historical or current population estimates exist for the species, recent studies and ongoing research have shown the bats to be distributed across all the major Hawaiian Islands, including Kauaʻi, Oʻahu, Lānaʻi, Maui, Molokaʻi, and Hawaiʻi (USFWS 2021). The Hawaiian hoary bat holds a significant place in the archipelago's biodiversity, given the species' limited distribution and status as being the only native land mammal.

The Hawaiian hoary bat is regarded as a habitat generalist and demonstrates considerable flexibility in its use of native and non-native habitats for roosting and foraging. Radio telemetry studies on Hawaiʻi Island have documented the hoary bat traversing greater than 10.5 miles (17 kilometers) from its roost site to forage among a mosaic of habitat elements such as the edges of cluttered forests and within open spaces including forest gaps, gulches, windrows, roadways, open water, pastures, and above forest canopy (Bonaccorso et al. 2015; Whitaker and Tomich 1983; Belwood and Fullard 1984; Jacobs 1996, 1999; Poe 2007).

Hawaiian hoary bats use both native and non-native tree species for roosting. At least 19 different roost trees species have been identified to date (Montoya-Aiona et al. 2023) The diversity in roost trees used by Hawaiian hoary bats is primarily among non-native species. Only three native species, ʻōhiʻa lehua (*Metrosideros polymorpha*), lama (*Diospyros sandwicensis*), and uluhe (*Dicranopteris linearis*) have been confirmed being used by hoary bats. Habitat use studies of radio telemetered bats indicate that Hawaiian hoary bats select roost trees with a mean height of 68 feet (21 meters), a mean diameter at breast height of 29 inches (75 centimeters), a mean canopy cover of 43 percent, and are a mean distance of 95 feet (29 meters) from the forest edge (Montoya-Aiona et al. 2023). These results suggest that vegetation structure, which provides protection and thermoregulatory benefits, and not tree species, is the deciding factor of roosting use by Hawaiian hoary bats.

Hawaiian hoary bats forage on a variety of insects encompassing 24 families from 10 different orders (Todd 2012; Pinzari et al. 2019). However, Lepidoptera (moths) represent the most abundant and diverse insect taxa in the diet of hoary bats, followed by Coleoptera (beetles) (Todd 2012; Pinzari et al. 2019). Following lactation, a period of high energetic demand, Hawaiian hoary bats have been shown to selectively forage on Coleoptera, which may be easier to catch and satisfy additional nutrient demands (Todd 2012). For many bat species, including Hawaiian hoary bats, increased rates in activity are associated with increased abundance of insect prey (Gorresen et al. 2018; Todd 2012; Haddad et al. 2001; Knops et al. 1999).

On Hawaiʻi island, hoary bats have been shown to migrate along elevational gradients in response to changes in temperature, rainfall, and food resources; they occupy low elevations during the summer and fall breeding seasons and migrate to the interior highlands during the winter post-lactation period (Menard 2001; Todd 2012 Bonaccorso et al. 2015). Seasonal changes in acoustic activity observed at several locations on Oʻahu (Thompson and Starcevich 2021; Gorresen et al. 2015), Maui (Todd et al. 2016; Kaheawa Wind Power I 2020; Kaheawa Wind Power II 2020), and Kauaʻi (Bonaccorso and Pinzari 2011; Welch et al. 2021) suggest similar elevational migrations occur on these islands.

2.2 EXISTING DATA IN THE SURVEY AREAS

2.2.1 Miloli‘i and Mākaha Ridge

The vegetation communities on the Miloli‘i and Mākaha Ridge can be roughly classified as a mixture of native and non-native plant species. The dominant canopy cover tree species include the non-native silk oak (*Grevillea robusta*), slash pine *(Pinus elliottii*), and eucalyptus (*Eucalyptus* spp.), along with the native koa (*Acacia koa*) and ‘ōhi'a lehua (Wood 2006). The understory consists of strawberry guava (*Psidium cattleianum*), shrubs of *Lantana camara*, and beardgrass (*Schizachyrium condensatum* or *Andropogon glomeratus*) (Wood 2006; NAVFAC Pacific 2024).

No acoustic surveys have been conducted for bats along the Miloli‘i Ridge prior to this survey; however, bat acoustic surveys have been conducted along the Mākaha Ridge and bat activity patterns are expected to be similar due to the close proximity (0.75 mile or 1.2 kilometers) of the two areas. Previous bat acoustic surveys conducted within and just outside of the Mākaha Ridge installation boundary indicate year-round bat activity, with increased seasonal activity occurring during late fall, winter, and early spring (November–April) (Bonaccorso and Pinzari 2011).

2.2.2 Kamokalā Ridge

Vegetation cover within the PMRF Kamokalā Ridge installation boundary consists primarily of kiawe (*Prosopis pallida)* and koa haole (*Leucaena leucocephala*). Just outside of the installation boundary are several irrigation ditches with large mango trees (*Magnifera indica*) as well as several agricultural reservoirs. The surrounding Kamokalā Ridge topography steepens quickly from 40 to 700 feet (12 to 213 meters) where vegetation becomes less dense.

Previous bat acoustic surveys conducted within the installation boundary at Kamokalā Ridge indicate year-round bat activity with increases in bat activity occurring in September and February (Bonaccorso and Pinzari 2011).

2.2.3 Mānā Plain

Vegetation cover on the Mānā Plain is primarily composed of cultivated crops, pasture/hay, grassland, and scrub/shrub. The two dominant plant species in unmanaged areas consists of kiawe and koa haole (NAVFAC Pacific 2024). There are several water features throughout the Mānā Plain including irrigation ditches, mud flats, and flooded ponds.

Bat acoustic surveys conducted within the PMRF Barking Sands Main Base installation boundary, adjacent to the Mānā Plain (see Figure 1-1), detected bats year-round, including active foraging by multiple individuals (Bonaccorso and Pinzari 2011; Welch at al. 2021). Bat activity peaked in the fall (September–November) with lower activity levels occurring during the winter. During peak periods, bat activity in the northern portion of the PMRF Barking Sands Main Base Installation over a 7-day sampling period was measured at almost 26,000 calls (echolocation pulses) in September 2010 and exceeded 500,000 total calls in November 2010 (Bonaccorso and Pinzari 2011). Surveys conducted more recently measured lower bat activity, 1,920 calls in September 2020 and 609 calls in November 2020 during a similar 7-day sampling period (Welch at al. 2021). The high rates of activity suggest that the habitat features in the region serve as important foraging resources and maybe roosting resources as well.

CHAPTER 3
SURVEY METHODOLOGY AND PROTOCOLS

3.1 SURVEY METHODS

3.1.1 Habitat Assessment

Existing literature and aerial imagery data were reviewed as part of the desktop analysis to assess potential habitat. A field-based assessment of habitat was conducted for each of the four bat survey areas to evaluate the potential quality of the habitat for use by bats. The field-based habitat assessment was used to 1) ground truth the quality of habitat from the desktop assessment, and 2) further evaluate the quality of the habitat as a potential roosting and foraging area. The field-based habitat assessment was conducted in September 2023 in conjunction with the deployment of acoustic monitoring equipment (see Table 1-1). Additional plant species data provided by the Vegetation Surveys were incorporated into the bat habitat assessment (NAVFAC Pacific 2024).

3.1.2 Acoustic Monitoring

Hawaiian hoary bat activity was monitored over a 12-month period (1 October 2023–30 September 2024) at six locations within four survey areas (Miloli‘i Ridge n = 1, Mākaha Ridge n = 1, Kamokalā Ridge n = 1, and the Mānā Plain n = 3). The monitoring site locations at each of the four bat survey areas is provided in Figures 3-1 through 3-5 and site photos are available in Appendix A. Acoustic monitoring locations were chosen based on 1) monitoring needs expressed by the Navy during the site visit on 27 July 2023, 2) the best spatial distribution across potential bat foraging and roosting habitat, 3) historical monitoring locations, and 4) minimizing theft.

Acoustic monitoring was conducted with Song Meter SM4BAT-FS (SM4) ultrasonic acoustic recorders equipped with a high frequency waterproof microphone (SMM-U2; Wildlife Acoustics, Inc., Maynard, Massachusetts), elevated 10 feet (3 meters) above the ground on poles and powered by 12-volt, 36-amp hour batteries connected to 20 watt, 12-volt Solar Panels (ACOPower, Walnut, California). SM4 units and SMM-U2 microphones were placed within forest gaps, along forest edges, or under sparse vegetated canopies within forests to minimize obstruction of the microphones from the airspace above. SM4 acoustic recorders are passive recorders only and do not have transmission capabilities. The advanced triggering systems of the acoustic monitors only recorded when bats were detected and were programmed with a 16 kilohertz high pass filter to ensure low frequency noises below 16 kilohertz were not recorded. All acoustic monitors recorded nightly beginning 1 hour before sunset and ending 1 hour after sunrise. Acoustic recordings with associated dates and times were stored on SDXC class 10 memory cards (Western Digital, San Jose, California) within the SM4 (see Appendix B for a complete list of hardware settings). All electrical equipment was housed in a sealed container to prevent ant ingress. Data collection and equipment maintenance (i.e., microphone sensitivity check and solar and battery health) was conducted monthly, with the exclusion of January and September 2024 (see Table 1-1). All bat acoustic data was stored locally on an external hard drive and backed up monthly on secure servers.

Figure 3-1 Miloli‘i Ridge and Mākaha Ridge Survey Areas

Figure 3-2 Kamokalā Ridge Survey Area

Figure 3-3 Mānā Plain Northern Region Survey Area

Figure 3-4 Mānā Plain Central Region Survey Area

Figure 3-5 Mānā Plain Southern Region Survey Area

3.2 DATA ANALYSIS

Acoustic recordings were processed in Kaleidoscope PRO version 5.4.0 (Wildlife Acoustics, Inc., Maynard, Massachusetts) using the Bats of North America 5.1.0 AutoID classifier for Hawaiʻi to assign a preliminary classification (see Appendix B for a complete list of software settings). Manual verification was conducted by an expert on 100 percent of classified acoustic call files to remove any false-positive/negative identification errors from the data set prior to analysis. A minimum threshold of two echolocation pulses within a single recording file was used to confirm a positive detection. The proportion of sampling nights with a bat detection, or "detection rate" was used as a metric to quantify monthly and annual bat activity at the survey areas. The number of call files recorded per hour was used to examine the timing of nightly bat activity at each monitoring location. While call files identifying multiple individuals foraging were observed, quantification of this metric was not included within the scope of analysis.

Analysis of variance (ANOVA) and Tukey's honest significance difference (Tukey's HSD) were used to test for differences in annual detection rates and the frequency of nightly call files between monitoring sites. Data were normalized with an Ordered Quantile Normalization transformation using the 'bestNormalize' package in R (Peterson 2021). All tests were two-tailed, employed an alpha value of 0.05, and were conducted in R version 4.4.1 (R Core Team 2024). The characterization of Hawaiian hoary bat seasons corresponds approximately to Gorresen et al. (2013).

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CHAPTER 4
SURVEY RESULTS

4.1 ANNUAL AND SEASONAL BAT ACTIVITY

Hawaiian hoary bats were detected on 1,752 nights out of 2,144 detector-nights sampled across all pooled monitoring sites and months, resulting in a detection rate of 0.82 (Table 4-1). Annual detection rates varied between monitoring sites (Table 4-1) and were significantly higher (ANOVA: $F_{6,72} = 5.27$, $P < 0.001$) at Miloli‘i Ridge compared to Middle Gate Wetland (Tukey’s HSD: $P < 0.050$), Kamokalā Ridge (Tukey’s HSD: $P < 0.017$), and South Ag Site (Tukey’s HSD: $P < 0.002$). Detection rates were also significantly higher at the North PMRF Site compared to the South Ag Site (Tukey’s HSD: $P < 0.010$).

Table 4-1 Annual Detection Rates for Hawaiian Hoary Bats Monitored at Six Locations Across PMRF Between October 1, 2023 and September 30, 2024.

Monitoring Location	Elevation (Feet)	No. of Nights Sampled	No. of Nights with Detections	Detection Rate
North PMRF Site (Mānā Plain)	10	354	337	0.95
Middle Gate Wetland (Mānā Plain)	9	335	246	0.73
South Ag Site (Mānā Plain)	12	357	224	0.63
Kamokalā Ridge	190	366	258	0.71
Mākaha Ridge	1,630	366	329	0.90
Miloli‘i Ridge	1,780	366	358	0.98
Total		**2,144**	**1,752**	**0.82**

Seasonal fluctuations in detection rates were evident across the six monitoring locations (Figure 4-1). In October and November of the post-lactation reproductive period, detection rates were consistently high across all monitoring locations. In December, during the transition into the pre-pregnancy reproductive period, detection rates remained relatively stable and high generally (above 0.68), but declined at South Ag Site and Kamokalā Ridge, reaching their lowest in March. At South Ag Site and Kamokalā Ridge, detection rates increased in April of the pregnancy reproductive period and decreased in May and June along with a decrease at Middle Gate Wetland. Following the decline in June, detection rates sharply increased during July and August of the lactation reproductive period and into September of the post-lactation reproductive period. (Figure 4-1).

Seasonal fluctuations in detection rates were minimal at North PMRF Site (range: 0.81 – 1.00) and Miloli‘i Ridge (range: 0.90 – 1.00) (Figure 4-1).

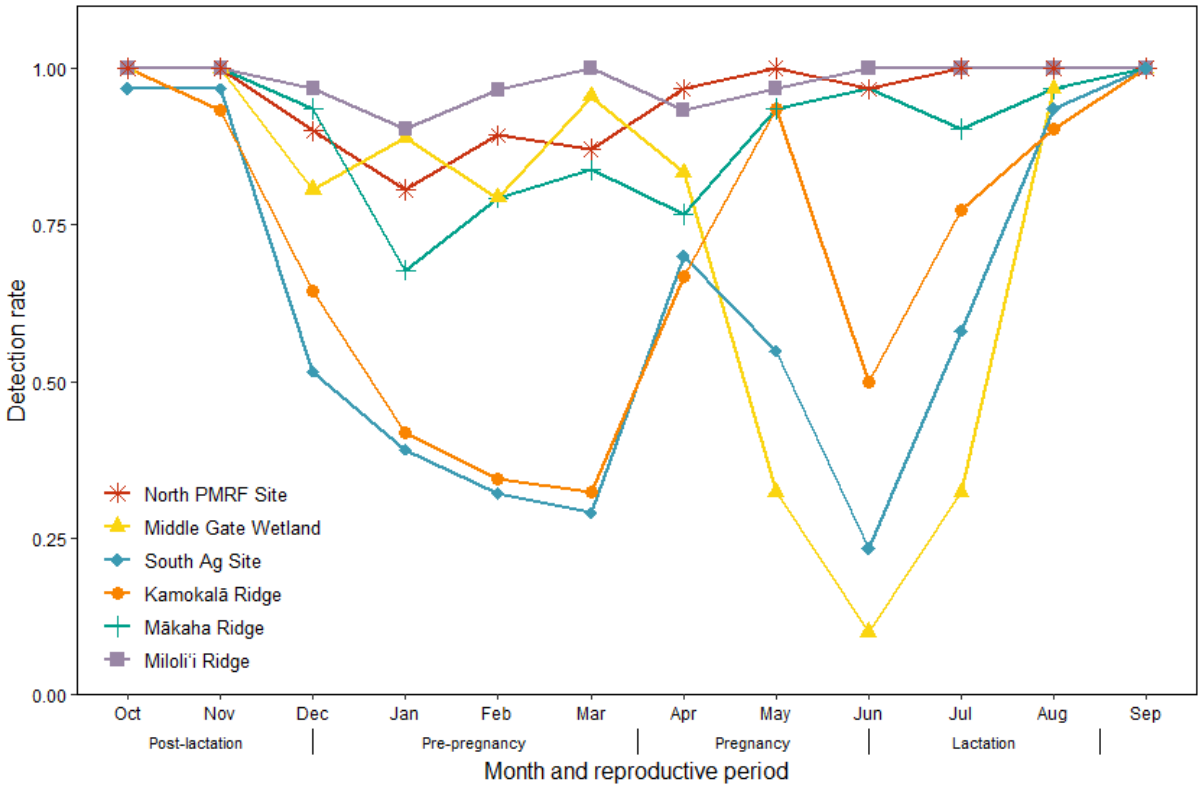

Figure 4-1 Monthly Detection Rates for Hawaiian Hoary Bats Monitored at Six Locations Across PMRF Between October 1, 2023 and September 30, 2024 with Corresponding Reproductive Periods

4.2 NIGHTLY BAT ACTIVITY

The timing and duration of nightly bat activity varied across sites and elevation. Among lower elevation sites (9 to 190 feet or 2.7 to 57 meters above sea level), the North PMRF Site had a significantly higher number of calls compared to other sites (ANOVA: $F_{5,75} = 73.22$, $P < 0.001$), accounting for 50 percent of all call files. Bat activity began 45 minutes prior to sunset and increased sharply, peaking approximately 2 hours after sunset. After the peak, bat activity gradually declined with activity diminishing around 9–10 hours after sunset (Figure 4-2). Nightly bat activity at the other low elevation sites and Kamokalā Ridge followed this general trend, with bat activity starting just after sunset, peaking approximately 2 hours after sunset, and gradually declining throughout the night (Figure 4-2).

Nightly bat activity at the high elevation sites (1,630 and 1,780 feet or 497 and 542 meters above sea level) was bimodal, although patterns differed between sites. At Miloli‘i Ridge, which had the second greatest number of call files and made up 20 percent of all call files recorded, the bimodal activity pattern was more pronounced. Nightly activity began 1 hour before sunset and reached the first nightly peak approximately 30 minutes after sunset (Figure 4-2). Nightly activity at Mākaha Ridge did not begin until sunset occurred and then gradually increased until 4 to 5 hours after sunset (Figure 4-2). Bat activity at both high elevation sites increased again approximately 10 hours after sunset with a second peak approximately 12 hours after sunset (Figure 4-2). The last calls recorded occurred 53 minutes after sunrise at Miloli‘i Ridge and 48 minutes after sunrise at Mākaha Ridge.

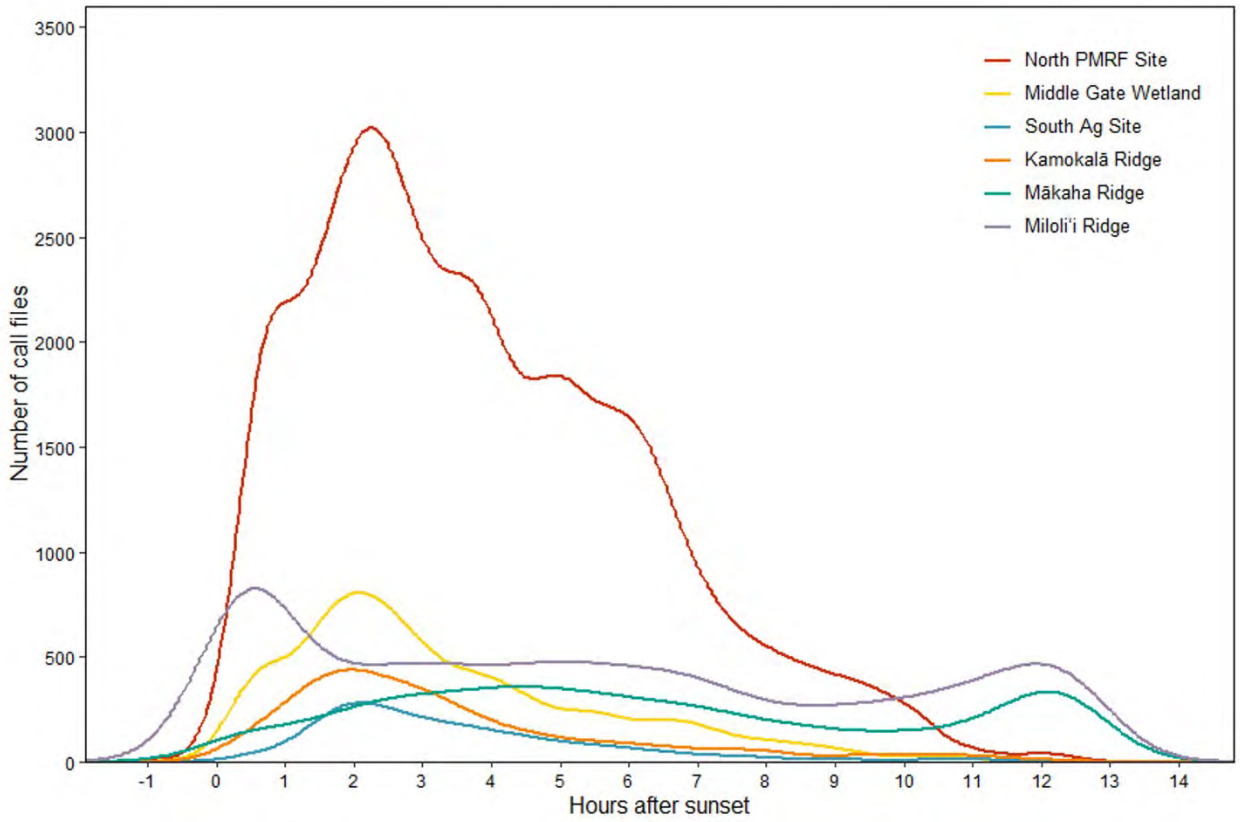

Figure 4-2 Timing of Nightly Bat Activity at the Six Survey Areas

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CHAPTER 5
DISCUSSION

This Hawaiian hoary bat acoustic survey provides valuable insight on the seasonal and nightly use of habitats across the four survey areas. Results from this study indicate year-round bat presence across all survey areas between October 2023 and September 2024, with an overall detection rate of 0.82. There was considerable site-level variation in both seasonal and overall detection rates (Figure and Table 4-1, and Appendix C). Detection rates were highest at Miloliʻi Ridge and North PMRF Site. These two high and low elevation sites, respectively, also demonstrated the least amount of seasonal fluctuation in detection rates. Among the other low elevation sites (South Ag Site, Kamokalā Ridge, and Middle Gate Wetland), seasonal fluctuations in detection rates were particularly pronounced (Figure 4-1 and Appendix C). On other Hawaiian islands, seasonal fluctuations in detection rates are broadly associated with reproductive periods and elevation (Menard 2001; Todd 2012; Gorresen et al. 2013; Thompson and Starcevich 2021). The seasonal fluctuation in detection rates observed in this study do appear to be associated with reproductive periods. Detection rates were highest during the lactation and post-lactation reproductive periods (August through November), when there is an abundance of females with newly born juveniles, followed by adult males in search of reproductive females. Lower detection rates occurred during the pre-pregnancy and pregnancy reproductive periods, when males and females are separated until the following post-lactation/mating season and are thought to enter prolonged bouts of torpor (Menard 2001; Todd 2012). Seasonal fluctuations in detection rates do not appear to be associated with elevation and instead may be related to other site-specific habitat features (i.e., changes in agricultural land use, vegetation cover, or insect abundance). The differences in the nightly activity patterns observed between low and high elevations may provide insight as to how bats are using these areas generally. Hawaiian hoary bats are considered a generalist species and will forage and roost in a variety of habitats (Bonaccorso et al. 2015; Whitaker and Tomich 1983; Belwood and Fullard 1984; Jacobs 1996, 1999; Poe 2007). The unimodal peak in activity that occurred approximately 2 hours after sunset among low elevation sites may indicate that the primary use of these habitats is for foraging. Similar peaks in activity have been observed in diet studies conducted on Hawaiʻi island and shown to be correlated with peaks in insect abundance (Todd 2012). After foraging bouts, bats may rest at a temporary night-roost in proximity to their foraging site before having a second foraging bout or returning to their day-roost (Bonaccorso et al. 2015; Todd pers., obs.). Among high elevations, the nightly activity was bimodal with early evening peaks occurring just after sunset at Miloliʻi Ridge and a second peak occurring at both high elevation sites at sunrise (see Figure 4-2). These bimodal patterns with peaks so close to sunrise and sunset may indicate that bats are leaving and returning to a day-roost site. The higher elevations would also provide cooler temperatures for roosting bats during the day compared to temperatures at lower elevations. Some individuals will forage near their day-roost site and the interim period between the bimodal peaks indicates that some individuals are foraging near these areas throughout the evening (see Figure 4-2) (Barclay 1989; Bonaccorso et al. 2015).

The high detection rates at Miloliʻi Ridge and North PMRF Site combined with the high frequency in the number of call files, particularly at the North PMRF Site, indicate these sites provide stable and favorable conditions for bats and underscores the importance of the habitats surrounding these areas. The abundance and duration of nightly activity at the North PMRF Site is of particular interest. The North PMRF Site had almost five times the amount of call files than the next closest site, Middle Gate Wetland (see Figure 4-2), only 2.3 miles (3.7 kilometers) away. However, there are no notable structural differences in foraging habitat between the two sites. Additional observations, including on-site visual surveys during the evening

accompanied by light trapping surveys for insects would be required to further understand the driving factors that influence the high rates of bat activity at the North PMRF Site.

This report's findings will inform future planning for the PMRF and KPGO areas, aiding in the development of effective avoidance and minimization and adds to the limited information that exists on bat populations and habitat use on Kaua‘i.

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Appendix A
SM4 Acoustic Monitor Site Photos

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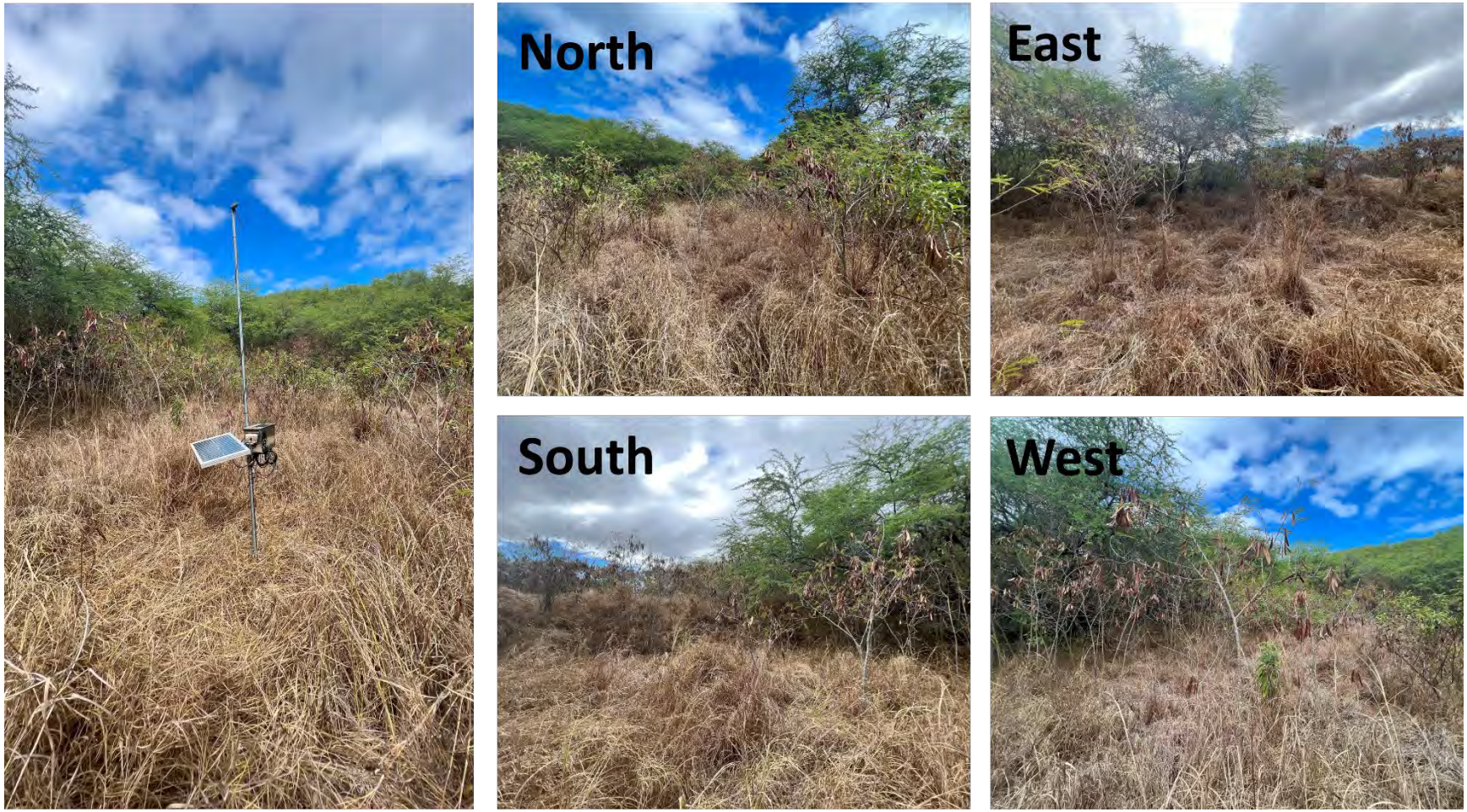

Figure A-1 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the North PMRF Site, Mānā Plain

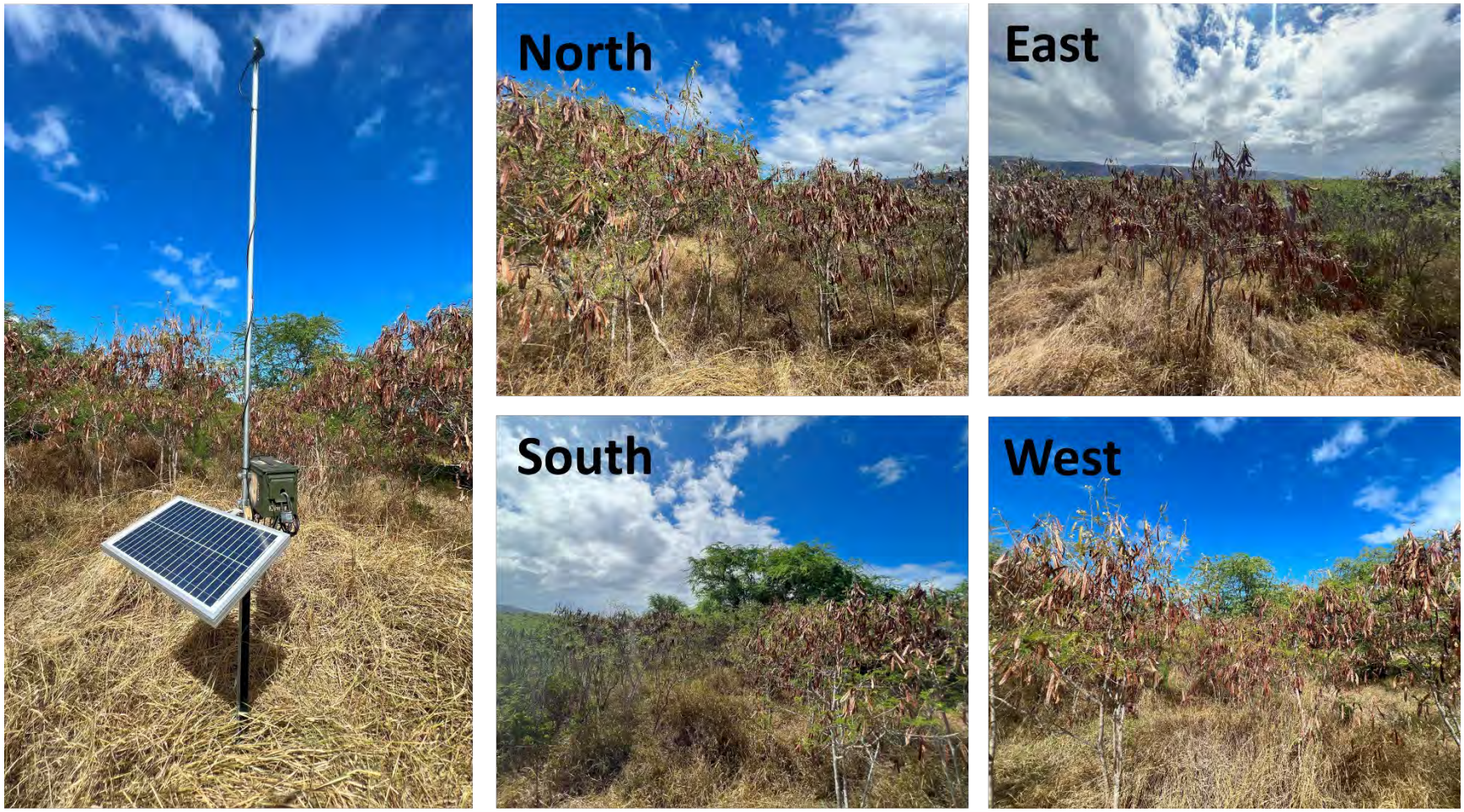

Figure A-2 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the Middle Gate Wetland Site, Mānā Plain

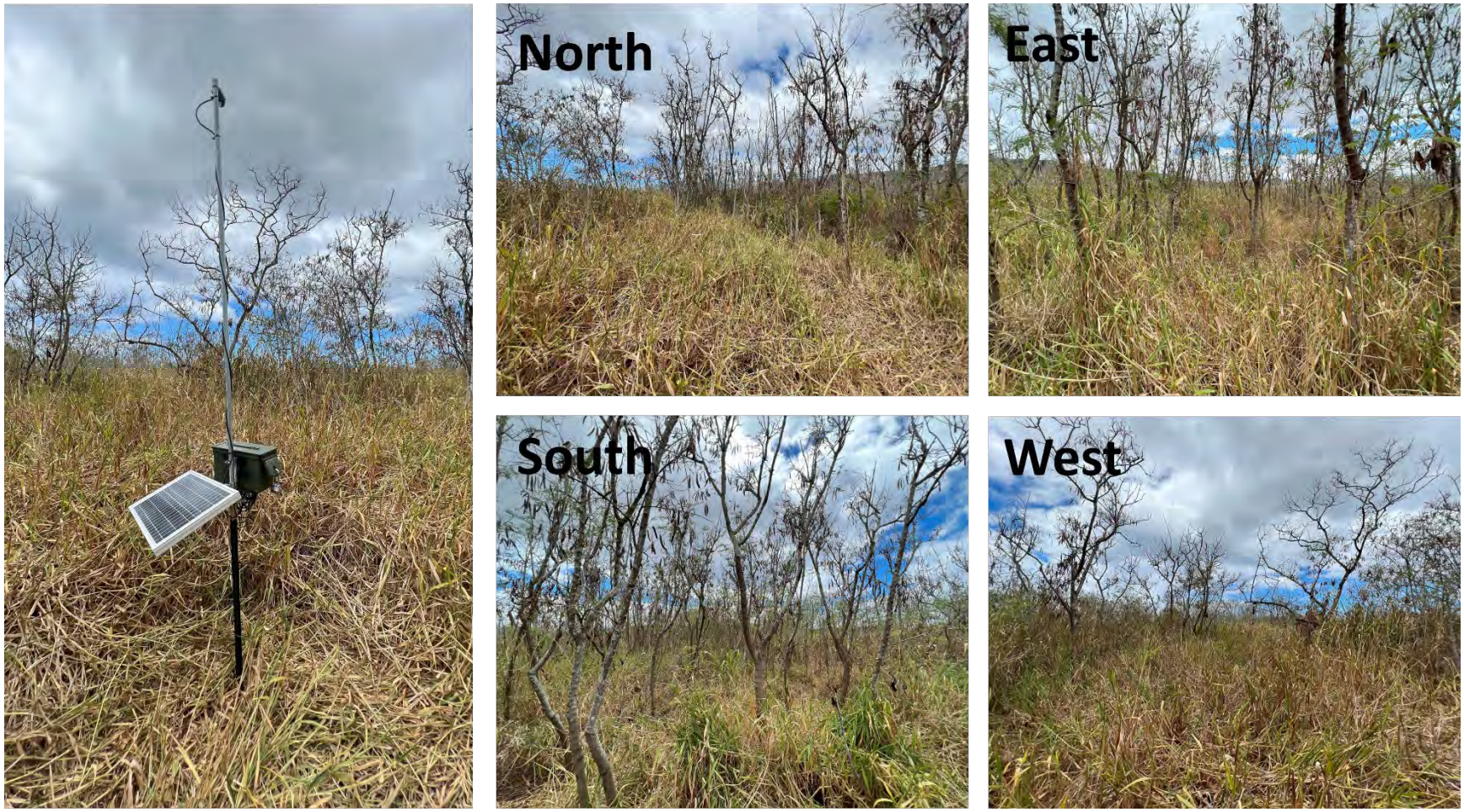

Figure A-3 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the South Agricultural Site, Mānā Plain

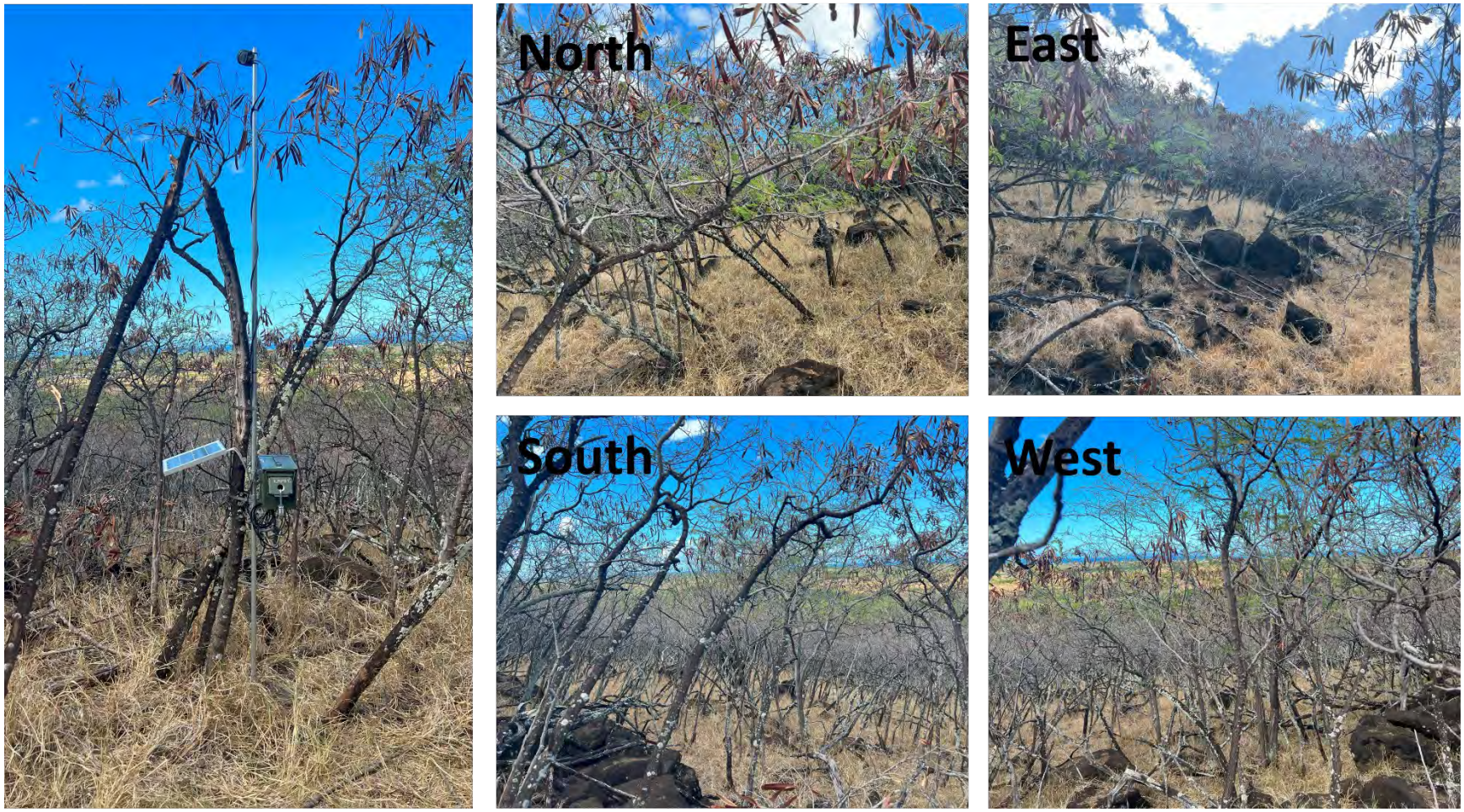

Figure A-4 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the Kamokalā Ridge Site

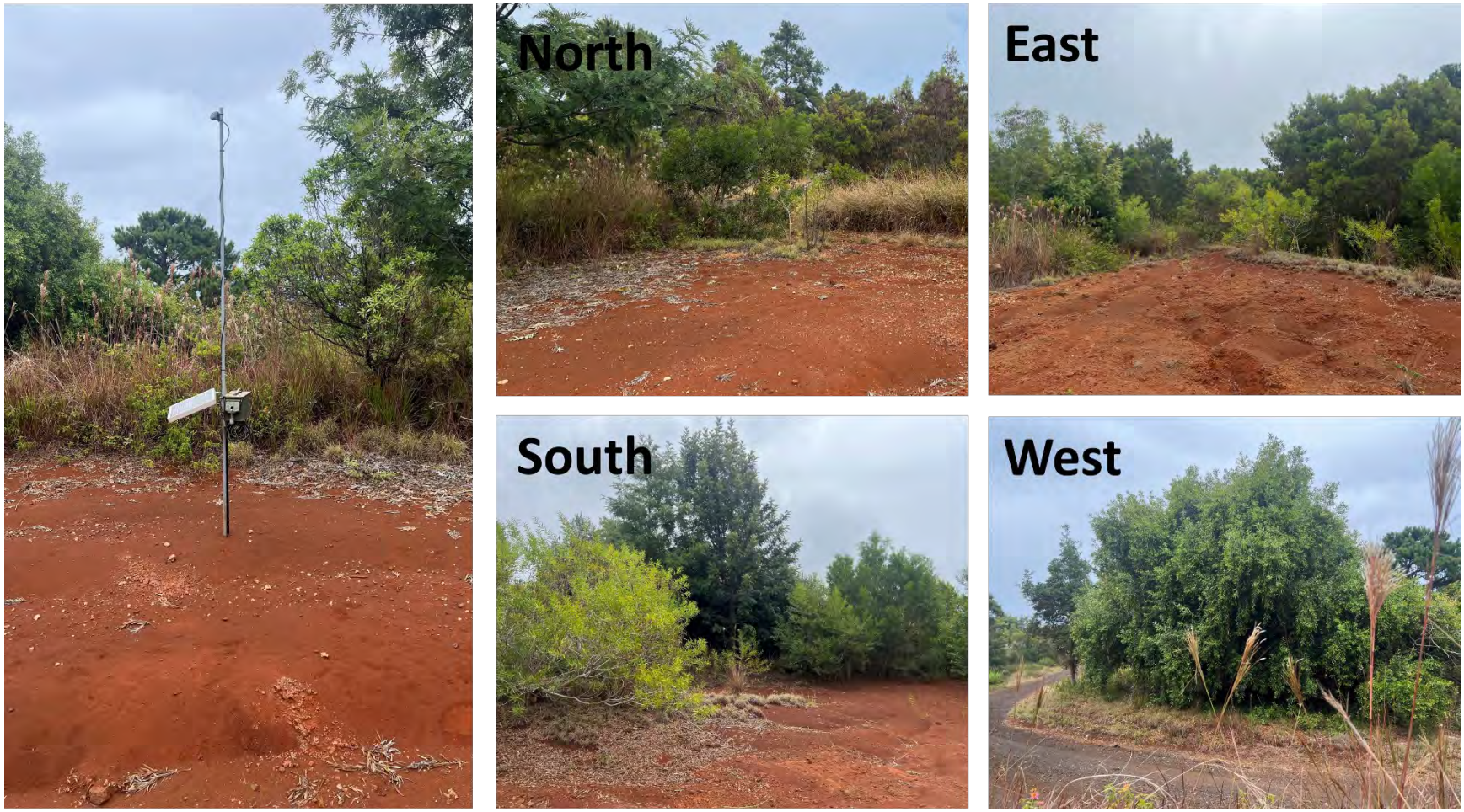

Figure A-4 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the Mākaha Ridge Site

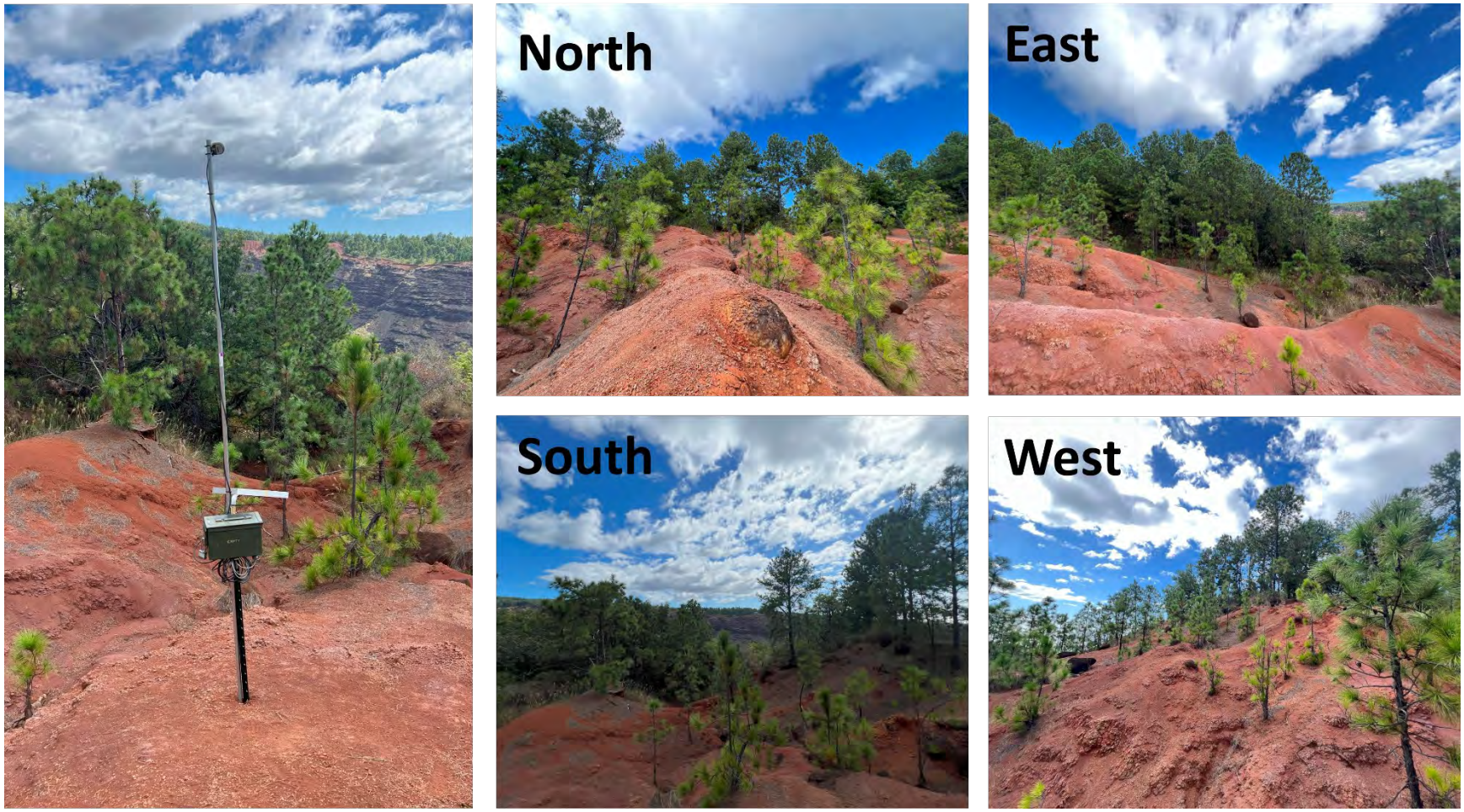

Figure A-4 Photos of the SM4 Acoustic Monitor and Immediate Surrounding Habitat at the Miloli‘i Ridge Site

Appendix B
Hardware and Software Parameters and Settings

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Platform	Parameter	Setting
Hardware		
Wildlife Acoustics SM4BAT-FS	Data type	Full spectrum
	Trigger window	3 seconds
	Trigger max	15 seconds
	Sampling rate	192 kilohertz
	Gain	12 decibels
	Minimum trigger frequency	16 kilohertz
	File format	.WAV
	Survey window	1 hour before sunset to 1 hour after sunrise
Software		
Kaleidoscope Pro v5.6.4	Signal of interest	8–120 kilohertz
	Duration	2–500 milliseconds
	Minimum pulses	2
	Classifier	Bats of North America 5.4.0
	Sensitivity	0 Balanced (neutral)

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Appendix C
Monthly Detection Rates for Hawaiian Hoary Bats Monitored Across PMRF Between 1 October 2023 and 30 September 2024

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Monitoring Location	Sampling Period	No. of Nights Sampled	No. of Nights with Detections	Detection Rate
Kamokalā Ridge	October 2023	31	31	1.00
	November 2023	30	28	0.93
	December 2023	31	20	0.65
	January 2024	31	13	0.42
	February 2024	29	10	0.34
	March 2024	31	10	0.32
	April 2024	30	20	0.67
	May 2024	31	29	0.94
	June 2024	30	15	0.50
	July 2024	31	24	0.77
	August 2024	31	28	0.90
	September 2024	30	30	1.00
Mākaha Ridge	October 2023	31	31	1.00
	November 2023	30	30	1.00
	December 2023	31	29	0.94
	January 2024	31	21	0.68
	February 2024	29	23	0.79
	March 2024	31	26	0.84
	April 2024	30	23	0.77
	May 2024	31	29	0.94
	June 2024	30	29	0.97
	July 2024	31	28	0.90
	August 2024	31	30	0.97
	September 2024	30	30	1.00
Middle Gate Wetland	October 2023	31	31	1.00
	November 2023	30	30	1.00
	December 2023	31	25	0.81
	January 2024	9	8	0.89
	February 2024	29	23	0.79
	March 2024	22	21	0.95
	April 2024	30	25	0.83
	May 2024	31	10	0.32
	June 2024	30	3	0.10
	July 2024	31	10	0.32
	August 2024	31	30	0.97

Monitoring Location	Sampling Period	No. of Nights Sampled	No. of Nights with Detections	Detection Rate
	September 2024	30	30	1.00
Miloli‘i Ridge	October 2023	31	31	1.00
	November 2023	30	30	1.00
	December 2023	31	30	0.97
	January 2024	31	28	0.90
	February 2024	29	28	0.97
	March 2024	31	31	1.00
	April 2024	30	28	0.93
	May 2024	31	30	0.97
	June 2024	30	30	1.00
	July 2024	31	31	1.00
	August 2024	31	31	1.00
	September 2024	30	30	1.00
North PMRF Site	October 2023	31	31	1.00
	November 2023	30	30	1.00
	December 2023	20	18	0.90
	January 2024	31	25	0.81
	February 2024	28	25	0.89
	March 2024	31	27	0.87
	April 2024	30	29	0.97
	May 2024	31	31	1.00
	June 2024	30	29	0.97
	July 2024	31	31	1.00
	August 2024	31	31	1.00
	September 2024	30	30	1.00
South Ag Site	October 2023	31	30	0.97
	November 2023	30	29	0.97
	December 2023	31	16	0.52
	January 2024	23	9	0.39
	February 2024	28	9	0.32
	March 2024	31	9	0.29
	April 2024	30	21	0.70
	May 2024	31	17	0.55
	June 2024	30	7	0.23
	July 2024	31	18	0.58

Monitoring Location	Sampling Period	No. of Nights Sampled	No. of Nights with Detections	Detection Rate
	August 2024	31	29	0.94
	September 2024	30	30	1.00

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KPGO Flora Survey Report

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Vegetation Survey Final Report of the Kōkeʻe Park Geophysical Observatory

Kaua'i, Hawaiʻi

Task Order 28
Contract No. 80GSFC21CA008

Prepared For:

GFSC Environmental Planning Group and WFF Center NEPA Group
National Aeronautics and Space Administration
Goddard Space Flight Center
8800 Greenbelt Rd, MD 20771

Nic Frederick, Project Manager
Dawson Ohana, LLC
4100 Market St, Suite 117
Huntsville, AL 35808-3012

Prepared by:

Erin Colclazier
Hamer Environmental, L.P.
P.O. Box 2561
Mt. Vernon, WA 98273
Erin@Hamerenvironmental.com (360) 420-4201

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ACRONYMS AND ABBREVIATIONS

ac	acre
DLNR	Department of Land and Natural Resources
DON	Department of the Navy
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	foot
GIS	geographic information system
GPS	global positioning system
HEPA	Hawaiʻi Environmental Policy Act
HRS	Hawaiʻi Revised Statute
INRMP	Integrated Natural Resources Management Plan
KISC	Kauaʻi Invasive Species Committee
KPGO	Kōkeʻe Park Geophysical Observatory
KRCP	Kōkeʻe Resource Conservation Program
m	meter
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Systems Command
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
PEPP	Kauaʻi Plant Extinction Prevention Program
PMRF	Pacific Missile Range Facility
SOW	Statement of Work
SWAP	Hawaiʻi State Wildlife Action Plan
USFWS	United States Fish and Wildlife Service

1. INTRODUCTION

1.1 BACKGROUND

Hamer Environmental, L.P. (Hamer) was contracted by DAWSON to conduct vegetation mapping and plant surveys for the National Aeronautics and Space Administration (NASA) at Kōkeʻe Park Geophysical Observatory (KPGO) properties on Kaua'i, Hawaiʻi. The KPGO study area is approximately 25 acres (ac) and consists of five parcels (Figure 1-1). NASA and the U.S. Department of the Navy (Navy) in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR) are preparing a Real Estate Environmental Impact Statement (EIS) which evaluates the potential environmental consequences of the Navy's and NASA's proposal to retain the use of lands for the Navy's continued and ongoing military testing and training at Pacific Missile Range Facility (PMRF) and NASA's continued operations at KPGO. Existing NASA and Navy real estate agreements with the DLNR are set to expire between 2027 and 2030. The survey results will be used for future project planning, development of avoidance and minimization measures, National Environmental Policy Act (NEPA) analysis, Chapter 343, Hawaiʻi Revised Statutes (HRS) referred to as Hawaiʻi Environmental Policy Act (HEPA) analysis, and/or potential ESA Section 7 consultation.

Following the project Statement of Work (SOW) issued January 2024, Hamer completed desktop vegetation mapping and developed a work plan in April 2024 of vegetation resources for the survey area, Endangered Species Act (ESA)-listed plant species with potential to occur in the KPGO study area, proposed methodology and data collection, reporting, and schedule and personnel for field surveys. Hamer conducted vegetation surveys for ESA-listed plant species and completed a full botanical inventory within the KPGO study area over two survey seasons of April to May and October 2024. This report summarizes the findings of the vegetation surveys.

1.2 PURPOSE OF SURVEY

As stated in the project SOW, the purpose of the terrestrial vegetation surveys was to document protected plant species, map plant cover types and invasive plant species as well as predator and wildlife pest species within the KPGO study area (Figure 1-1). The objective of the vegetation surveys was to identify the terrestrial vegetation resources within the KPGO study area to support environmental evaluations and consultations.

1.3 SURVEY AREA

Based on the results of the desktop analysis presented in Chapter 2, specific plant species were targeted for surveys using the methodologies presented in Chapter 3. The KPGO study area is 24.9[1] ac and consists of five parcels (listed from north to south), Site E (5.7 ac), Site D (6.5 ac), Site C (6.2 ac), Site B (1.2 ac) and Site A

[1] This survey acreage (24.9 ac) is slightly larger than the acreage reported in the EIS for PMRF and KPGO Real Estate (April 2025) (23 ac) due to the removal of Site F (included in the ac for Site C above). The original lease noted a Site F; however, NASA is not seeking to renew their lease for this site only. Site F was included in this survey, therefore the acreage differs.

(5.3 ac) (Figure 1-1). The KPGO study area is located between 1,130 and 1,160 meters (m) (3,710 feet [ft] and 3,800 ft) elevation in Kōkeʻe State Park on the northerly Kaunuohua Ridge east of Mākaha Ridge and the northwestern end of Waimea Canyon (NAVFAC 2023). The KPGO study area is comprised of buildings and other impervious surfaces, as well as mowed lawns in open areas with forest along the property margins. The KPGO study area is located within the Waimea-Kekaha region of the State of Hawaiʻi's Conservation District, within a Resource Subzone, as classified by Chapter 205 of Hawaiʻi Revised Statutes. The KPGO study area is close to the Department of Forestry and Wildlife-managed Kuia Natural Area Reserve, located within a Protected Resource Subzone. Lands surrounding the KPGO study area are primarily used for recreation with trails, campgrounds and scenic overlooks (NAVFAC 2023). Hunting and cultural plant harvesting also occur in the surrounding lands.

The terrestrial vegetation survey area is 19.2 ac, consisting of all lands not comprised of impervious surfaces (roads, buildings) (National Oceanic and Atmospheric Administration [NOAA] 2010). The terrestrial vegetation survey area is 79% (15.1 ac) evergreen forest, 6% (1.2 ac) scrub-shrub land covers, and 15% (2.9 ac) developed open space (managed grasses like lawn or low-lying vegetation) (Figure 1-2).
The vegetation survey area consists of 15.1 ac of evergreen forest and 1.2 ac of scrub-shrub habitats to be surveyed by 10-m spaced parallel transects, and 2.9 ac of developed open space that will be surveyed more generally.

1.4 Survey Schedule and Personnel

Vegetation surveys were completed by one to two botanists from May 6-10, 2024 (spring survey) and from October 10-11, 14-17, 2024 (fall survey), with daily surveys conducted between 6:15 am and 3:30 pm Hawaiʻi Standard Time. Hamer botanists, Kenneth Woods and Erin Colclazier, conducted the vegetation surveys and determined the target special status plant species most likely to occur in the vegetation survey area. For all KPGO surveys (vegetation, fauna, and bat), Erin Colclazier was the project manager, and Kendra Ritchie was the GIS analyst.

Figure 1-1. Kōkeʻe Park Geophysical Observatory Study Area, Comprised of Five (5) Parcels (Sites A, B, C, D, E) on Kauaʻi, Hawaiʻi.

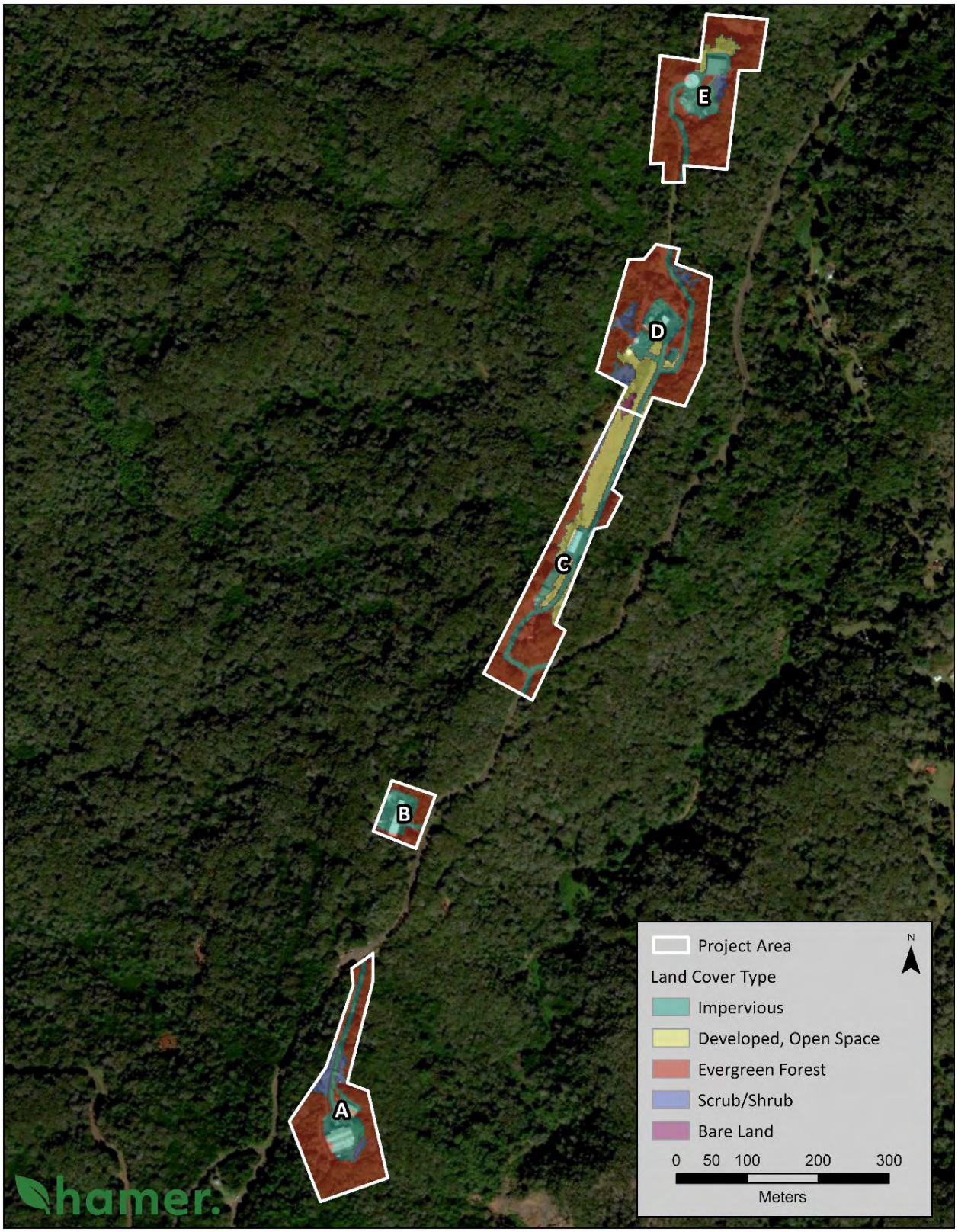

Figure 1-2. Land Cover Types for Vegetation Surveys (all but Impervious [green]) within the KPGO Study Area on Kaua‘i, Hawai‘i.

2. VEGETATION DESKTOP ANALYSIS

2.1 EXISTING DATA IN THE VEGETATION SURVEY AREA

Existing literature and GIS data from the Scope of Work (SOW) listed sources, additional sources, PMRF Navy Biologists, and Hamer's internal team knowledge was reviewed to determine potential habitats for special status flora species in the study area. Data reviewed by Hamer included:

- U.S. Navy PMRF Integrated Management Plan (INRMP) (NAVFAC 2023, NAVFAC 2010), and associated GIS data (NAVFAC 2024);
- NOAA Coastal Change Analysis Program Regional Land Cover and Change (NOAA 2010);
- Hawai'i State Wildlife Action Plan (SWAP) for federal- and state-listed species with potential to occur in the vegetation survey areas and species fact sheets (Hawai'i Department of Lands and Natural Resources [DLNR] 2015, DLNR 2024);
- U. S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) report produced to identify known federally listed species habitat and occurrences in the vicinity of the KPGO study area (USFWS 2024);
- Previous records for federal- and state-listed plant species within 1,000 m of the KPGO study area, maintained for the island of Kaua'i by Senior Botanist Ken Wood (Hamer team);
- Soil data (Natural Resources Conservation Service [NRCS] 2024), and
- Satellite imagery, site topography, and other available data resources to assess vegetation cover and potentially suitable habitats for vegetation in the KPGO study area.

2.2 SPECIAL STATUS PLANT SPECIES HABITAT REVIEW

Special status plants with potential to occur in the KPGO study area and details on their known habitat and likelihood of potential habitat presence within the vegetation survey area are listed in Table 2-1. This list includes all federally listed species and federal species of concern found in suitable habitats within 1,000-m of the KPGO study area. Plant species in the Hawai'i SWAP with potentially suitable habitat in the KPGO study area were also included.

Table 2-1. Special Status Plant Species Known to Occur or with Potential to Occur in the KPGO Study Area.

Common (Hawaiian) Name	Scientific Name	Regulatory Status[1]	Known Habitat & Occurrences	Potential to Occur in the KPGO Vegetation Survey Area
broadleaf dubautia (koholāpehu)	*Dubautia latifolia*	E	Endemic to the western side of the island of Kaua'i, scattered in mesic forests on ridges and in gulches with 20,355 ac of mostly state land designated as critical habitat, and includes the KPGO study area (USFWS 2024).	The survey area falls within designated critical habitat for the species and contains mesic forest with potential for this species to occur, though no extensive gulch or ridgeline habitat is found within the KPGO study area.

Common (Hawaiian) Name	Scientific Name	Regulatory Status[1]	Known Habitat & Occurrences	Potential to Occur in the KPGO Vegetation Survey Area
Halemanu broom-spurge (ʻakoko)	*Euphorbia halemanui (syn. Chamaesyce halemanui)*	E	Endemic to Kauaʻi in mesic forests on gulch slopes. Previously documented on State of Hawaiʻi lands just outside the boundary of Kōkeʻe Site D	The survey area contains mesic forest habitat with potential for this species to occur, though no extensive gulch habitat is found within the KPGO study area.
Nā Pali coast labordia (kāmakahala)	*Geniostoma helleri (syn. Labordia helleri)*	E	Occur in mesic forests of Kōkeʻe and western canyons in Kauaʻi.	The survey area contains mesic forest habitat with potential for this species to occur, though no canyon habitat is found within the KPGO study area. Designated critical habitat for this species does not overlap with the survey area (USFWS 2024).
kōlea	*Myrsine knudsenii (syn. M. mezii)*	E	Occur above streams through disturbed mixed mesic forest of *Acacia koa* and *Metrosideros polymorpha* with *Syzygium, Dodonaea, Hedyotis, Psychotria, Scaevola, Perrottetia*, and *Diplazium*.	The survey area contains disturbed mesic forest with associated species in Sites B, D, and E with potential for this species to occur, though designated critical habitat does not overlap with the survey area (USFWS 2024).
ʻaiea (hālena)	*Nothocestrum peltatum*	E	Occur in mesic forest of *Acacia koa* and *Metrosideros polymorpha* mesic forests with deep rich soil on steep slopes at elevations of 915-1,220 m.	The survey area falls within designated critical habitat for the species and contains mesic forest with potential for this species to occur, though steep forest slope habitat is limited within the KPGO study area.
kōpiko	*Psychotria grandiflora*	E	Endemic to Kauaʻi, in Kōkeʻe and Alakaʻi Swamp. Occur in mesic to mesic-wet forest at elevations of 1,040-1,230 m.	The survey area falls outside of designated critical habitat, mostly within Kōkeʻe State Park, but mesic forest habitat and elevational range for the species overlaps with the KPGO study area, so there is potential for this species to occur.
`aiakeakua, pōpolo	*Solanum sandwicense*	E	Endemic to Kauaʻi and Oahu and found in open areas of lowland to montane mesic forests of *Acacia koa* and *Metrosideros polymorpha* at elevations of 760-1,220 m.	The survey area falls within designated critical habitat for the species, and mesic forests are present, so there is potential for the species to occur.
-	*Xylosma crenatum*	E	Occur in diverse *Acacia koa* and *Metrosideros polymorpha* montane mesic forest, sometimes along streambanks, at elevations of 975-1,065 m.	The survey area falls outside of designated critical habitat, but mesic forest habitat and elevational range for the species overlaps with the KPGO study

Common (Hawaiian) Name	Scientific Name	Regulatory Status[1]	Known Habitat & Occurrences	Potential to Occur in the KPGO Vegetation Survey Area
				area, so there is potential for this species to occur.
Federal Species of Concern (no regulatory status)				
kauila, kauwila	*Alphitonia ponderosa*	SOC	Occur in dry to mesic forests and woodlands at elevations of 240-1250 m. Present in several different plant communities, including Koa Lowland Dry Forest, Olopua (*Nestegis*) Montane Mesic Forest, and a dry woodland with an open canopy of ʻōhiʻa (*Metrosideros polymorpha)* trees and a sparse hopbush (Dodonaea viscosa*)* and pūkiawe(*Leptocophylla tameiameiae*) shrub understory.	The survey area occurs within the upper elevational range for this species, and dry woodland habitat with an open canopy of *ʻōhiʻa* with sparse hopbush and pūkiawe shrub understory does occur, so potential habitat is present.
haha lua (hāhā lua, hāhā)	*Cyanea leptostegia*	SOC	Endemic to the western side of the island of Kauaʻi in wet-mesic forests.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present.
pua maka nui, akaʻakaʻawa	*Hillebrandia sandwicensis*	SOC	Occur in mesic forest ravines at elevations of 900–1800 m.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present, but few forest ravines are found within the KPGO study area.
pānaunau	*Lobelia yuccoides*	SOC	Occur in mesic forests and shrublands on ridge crests, gulch slopes, cliff faces and streambanks.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present, but ridge crests, cliff faces, steep gulches, and streambanks are absent from the KPGO study area.
Stone's alani (alani)	*Melicope stonei*	SOC	Occur in mesic montane forest within a narrow elevation range of 988-1,097 m.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present.
ʻoheʻohe	*Polyscias kavaiensis*	SOC	Occur in mesic to wet forests at elevations of 650-1,600 m.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present.

Common (Hawaiian) Name	Scientific Name	Regulatory Status[1]	Known Habitat & Occurrences	Potential to Occur in the KPGO Vegetation Survey Area
Alakai Swamp pritchardia (loulu)	*Pritchardia minor*	SOC	Occur in mesic to wet forests, in valleys and on exposed slopes from the Alakaʻi Swamp to the Kōkeʻe area and western Nāpali Coast and Waimea Canyon on Kauaʻi at elevations of 500 to 1,300 m.	The survey area occurs within the range of this species and contains mesic forests, so potential habitat is present, though valleys and exposed slope areas are limited within the KPGO study area.
keahi	*Sideroxylon polynesicum*	SOC	Occur in dry to dry-mesic forests at elevations of 130-640m.	The survey area occurs within the range of this species and contains dry-mesic forests, so potential habitat is present.
kāwaʻu, kāwaʻu kua kuku kapa	*Zanthoxylum dipetalum*	SOC	Occur in degraded *Metrosideros polymorpha*-dominated montane mesic forests, often on aʻa lava, at elevations of 915-1,040 m. Associated species include mamane, lama, alaa, iliahi, ohe kolea, and kopiko.	The survey area occurs within the range of this species and contains ʻohia-dominated mesic forests, so potential habitat is present.
Kauaʻi pricklyash, (aʻe)	*Zanthoxylum kauaense*	SOC	Occur in mixed mesic, dry or wet forests at elevations of 300-1,980 m.	The survey area occurs within the range of this species and contains dry-mesic forests, so potential habitat is present.

[1]Regulatory Status: E = Federal and State Endangered. SOC = Federal Species of Concern, no protection status.

2.3 Invasive Plant Species

Several invasive and/or noxious weeds species have been previously documented within the KPGO study area and include Florida blackberry (*Rubus argutus*), strawberry guava (*Psidium cattleyanum*), Kāhili Ginger (*Hedychium gardnerianum*), Asian Melastome (*Melastoma candidum*), Banana Poka (*Passiflora mollissima*), and fire tree (*Myrica faya*) (NAVFAC Pacific 2023).

3. Survey Methods

Vegetation field surveys in spring and fall 2024 were conducted by two botanists for all special status plants, throughout potentially suitable habitats within the KPGO study area. Vegetation survey tracks represent one botanist's survey coverage, with the other botanist typically within 10-15 m (Figure 3-1, Figure 3-2). Botanical surveys were not conducted in areas deemed unsafe by NASA and Navy personnel (portion of western Site D), and areas where dense vegetation precluded access for coverage and consisted of dense monotypic stands of invasive plants such as strawberry guava, Florida blackberry, and/or lantana (*Lantana camara*) (Figure 3-1, Figure 3-2).

Field surveyors conducted presence/absence surveys for all special status plant species with potential to occur in the KPGO study area, with a focus on those species listed in Table 2-1. A comprehensive plant

species list was compiled for each site within the KPGO study area during the vegetation surveys. Vegetation community/land cover types were refined in the field and remapped when needed. Garmin Global Positioning System (GPS) units were pre-loaded with survey transects, and GPS tracklogs recorded botanist coverage of the study area. When a special status plant was identified, the population was mapped with a sub-meter level accuracy GPS unit (Juniper Geode™). All special status plant data was recorded as specified in the SOW, in addition to collection of close-up and overview photos of the plant population. Incidental observations of special status fauna or invasive fauna were documented when encountered.

Figure 3-1. Spring 2024 Vegetation Survey Coverage of the KPGO Study Area on Kaua‘i, Hawai‘i.

Figure 3-2. Fall 2024 Vegetation Survey Coverage of the KPGO Study Area on Kaua‘i, Hawai‘i.

4. SURVEY RESULTS

All plant species observed during the spring and fall vegetation surveys, were identified, and individual lists were created for each of the 5 sites (A, B, C, D, and E) comprising the KPGO study area. For all sites combined, a total of 234 plant species were documented, including multiple special status plant species, and numerous noxious weeds and invasive plants (Appendix A). Photos of all special status plants and invasive weeds were collected as part of the plant survey Photo log (Appendix B). Representative photos were collected of vegetation cover types mapped in the KPGO study area (Appendix C). Overview photos were collected in different areas of the KPGO study area to show habitats (Appendix D).

4.1 SPECIAL STATUS PLANTS

Three special status plant species were identified during the 2024 vegetation surveys of the KPGO study area, the federal- and state-endangered kōpiko (*Psychotria grandiflora*), and two federal species of concern kauila (*Alphitonia ponderosa*), and Kaua‘i pricklyash or a‘e, (*Zanthoxylum kauaense*) (Table 4-1, Figure 4-1):

- **Kōpiko, Federally Endangered** – Six individual small trees-shrubs were documented within Site E in a small patch previously found by Ken Woods in 2006, and revisited, monitored, and tagged by Kaua‘i Plant Extinction Prevention Program (PEPP) August 12, 2020. Of the 10 individuals previously tagged by Kaua‘i PEPP in 2020, only 6 were alive on May 9, 2024, and several had growth from a side shoot lower on the woody stem after previous upper growth had died. Overall, the population appeared non-vigorous and in decline, all individuals were vegetative (no flowers/fruits), and one individual (tag no. 3) had insect-damaged leaves. A revisit to the population was conducted on October 10, 2024 and a large branch had broken from a nearby tree and fallen into the center of the kōpiko population, reducing the total number of plants to 5 individuals, and the plants continue to look unhealthy, with insect damage and only vegetative growth (Appendix B).

- **Kauila, Federal Species of Concern** – Seven detections of these trees were made within the KPGO study area, and two additional detections were made just outside of the boundary for Site E. All detections consisted of a single individual tree, and all were deemed as healthy but for one, which showed some evidence of dieback on some branches, and insect damage on some leaves. Detections were made within KPGO study area Sites B (2 detections), C (4 detections), Site E (1 detection) and two just outside of Site E.

- **Kaua‘i pricklyash or a‘e, Federal Species of Concern** – Two detections, both outside of the KPGO study area, were made of this species. One detection was of a single tree 7.5 m south of Site C boundary, and the other was of 5 individual trees 36 m south of Site B. Individual plants in both locations were deemed healthy.

Although federally endangered halemanu (*Euphorbia halemanui*) was previously documented outside Site D of the KPGO study area, the plant species was not identified during the 2024 vegetation surveys (NAVFAC Pacific 2010, 2023). Ohe`ohe (*Polyscias kavaiensis* syn. *Tetraplasandra k.*), a state species of concern, was noted previously in the KPGO study area (NAVFAC Pacific 2010, 2023). While ohe`ohe was not observed during this survey, two others, Hawai‘i `ohe (*P. hawaiensis*) and `ohe kiko`ola (*P. waimeae*), both endemic and a closely related species of the same genus, were documented.

Table 4-1. Special Status Plants Observed in the KPGO Study Area (Sites A, B, C, D, E) on Kaua‘i, Hawai‘i.

Common Name	Scientific Name	Status[1]	Site A	Site B	Site C	Site D	Site E	No. of Plants[2]	Life Stage/Condition/Notes
kōpiko	Psychotria grandiflora	E					x	5	One location in Site E, with 5 total individuals, in decline, with fewer surviving individuals than when documented in 2020 by Kaua‘i PEPP.
kauila, kauwila	Alphitonia ponderosa	SOC		x	x		x	7 (2)[2]	Seven locations: 2 in Site B, 4 in Site C, and 1 in Site E (+2 just outside of Site E/KPGO study area), all but 1 appeared healthy.
Kaua‘i pricklyash, a‘e	Zanthoxylum kauaense	SOC		(x)	(x)			(6)[2]	No detections were made within the KPGO study area, but 2 locations were documented just outside, 1 tree outside of Site C, and 5 individual trees just south of Site B.

[1]Regulatory Status: E = Federal and State Endangered, SOC = Federal Species of Concern.
[2]Number of Plants, when plants were identified outside of the KPGO project area their numbers were reported in parentheses and detailed in the notes column.

4.2 Invasive Plants

Seven State-listed noxious weeds were documented in the KPGO study area: Florida (prickly) blackberry and Chinese privet (*Ligustrum sinense*) were the most abundant noxious weeds found in every site, black wattle (*Acacia mearnsii*), spreading mist flower (*Ageratina riparia*), bull thistle (*Cirsium vulgare*), and ivy gourd (*Coccinia grandis*) were all found in limited numbers, each in only one site of the KPGO study area (Table 4-2, Appendix B). Noted as highly invasive by the Kōke‘e Resource Conservation Program (KRCP), strawberry guava (*Psidium cattleianum*) infestations were documented in every site of the KPGO study area, and in some areas were so dense that field botanists could not pass through (Sites A, D, and E contained dense patches). All five of the invasive plant species targeted by the KRCP occur in the KPGO study area: kahili ginger, fire tree (*Myrica faya*), firethorn (*Pyracantha angustifolia*), Chinese privet, and strawberry guava. Thirteen Kaua‘i Invasive Species Council (KISC) invasives were found including widespread lantana (*Lantana camara*), Florida blackberry, and Australian daisy (*Erigeron karvinskianus*). Those KISC species with more limited presence and potential for eradication included kahili ginger (*Hedychium gardnerium*), smoke bush (*Buddleia madagascariensis*), dogtail (*B. asiatica*), Bolivian fuschia (*Fuschia boliviana*), castor bean plant (*Ricinus communis*), and Australian tree fern (*Sphaeropteris cooperi*).

Table 4-2. Hawai‘i State Designated Noxious Weeds and Invasive Species in the KPGO Study Area.

Common Name	Scientific Name	Regulatory Status	Site A	Site B	Site C	Site D	Site E	Previous KPGO Detection	Notes
black wattle	Acacia mearnsii	NW			x	x			few in Site C, abundant on one slope in Site D
spreading mist flower	Ageratina riparia	NW	x	x	x			x	widespread in meadow and disturbed areas
dogtail	Buddleja asiatica	KISC	x		x				1-2 plants at each site, few
smoke bush	Buddleja madagascariensis	KISC				x			multiple plants in near vicinity of each other in Site D
bull thistle	Cirsium vulgare	KISC				x		x	2 plants
ivy gourd, tam lung	Coccinia grandis	NW, KISC	x						limited to a few small areas of Site A
Australian daisy	Erigeron karvinskianus	KISC	x	x	x	x	x	x	widespread
Bolivian fuschia	Fuschia boliviana	KISC	x		x	x	x		few patches at forest edges
kāhili ginger	Hedychium gardnerium	KISC, KRCP	x		x			x	few dense patches, each 80-200 sqft
Comb hyptis	Hyptis pectinata	NW	x		x				few individuals
lantana	Lantana camara	KISC	x	x	x	x		x	widespread
Chinese privet	Ligustrum sinense	KISC, KRCP	x	x	x	x	x		widespread
Japanese honeysuckle	Lonicera japonica	KISC	x	x	x	x	x		widespread
Asian melastome	Melastoma malabathricum subsp. Malabathricum (was M. candidum)	NW	x			x		x	few individuals
fire tree	Myrica faya (syn. Morella f.)	NW, KRCP	x	x	x	x	x	x	common along forest edges
strawberry guava	Psidium cattleyanum	KISC, KRCP	x	x	x	x	x	x	widespread
narrowleaf firethorn	Pyracantha angustifolia	KISC, KRCP		x	x	x		x	few small patches of 2-5 each, few
castor bean	Ricinus communis	KISC					x		Small patch in western Site E
Florida blackberry	Rubus argutus	NW	x	x	x	x	x	x	widespread
Australian tree fern	Sphaeropteris cooperi	KISC	x				x		1-2 plants at each site, few

[1]Regulatory Status: NW = State of Hawai‘i Department of Agriculture designated noxious weed (1992). KISC = Kaua‘i Invasive Species Committee invasive species targeted for removal. KRCP = Kōke‘e Resource Conservation Program

4.3 Vegetation and Land Cover Types

Vegetation and land cover mapping was conducted by desktop and refined in the field to document common plant species and concurrently with the special status plant surveys. The vegetation survey area was 19.2 ac, consisting of all lands not comprised of impervious surfaces (roads, buildings) (NOAA 2010). The survey area is 79% (15.1 ac) evergreen forest, 6% (1.2 ac) scrub-shrub land covers, and 15% (2.9 ac) developed open space (managed grasses like lawn or low-lying vegetation) (Table 4-3, Figure 4-1,Figure 4-2).

Table 4-3. Vegetation and Land Cover Types Mapped within the KPGO Study Area, Kaua‘i, Hawai‘i.

Vegetation Types[1] Mapped	Nativity	Land Cover Type[2]	Acres
non-native grass-forb meadow, lawn	Non-native	Developed, Open Space (lawn, meadow), landscaped	2.9
blackberry, lantana thicket	Non-native	Scrub/**Shrub**	1.2
blackberry thicket	Non-native	Scrub/**Shrub**	
Silk Oak, Lantana, Blackberry Invasive Forest	Non-native	Evergreen **Forest**	15.1
Mixed Koa, Non-Native Forest	Native, Non-native	Evergreen **Forest**	
Koa ‘Ōhi‘a Mixed Montane Mesic Forest	Native	Evergreen **Forest**	
		Total Acres	**19.2**

[1]Vegetation Type (NAVFAC Pacific 2023).
[2]Land Cover Type (NOAA 2010).

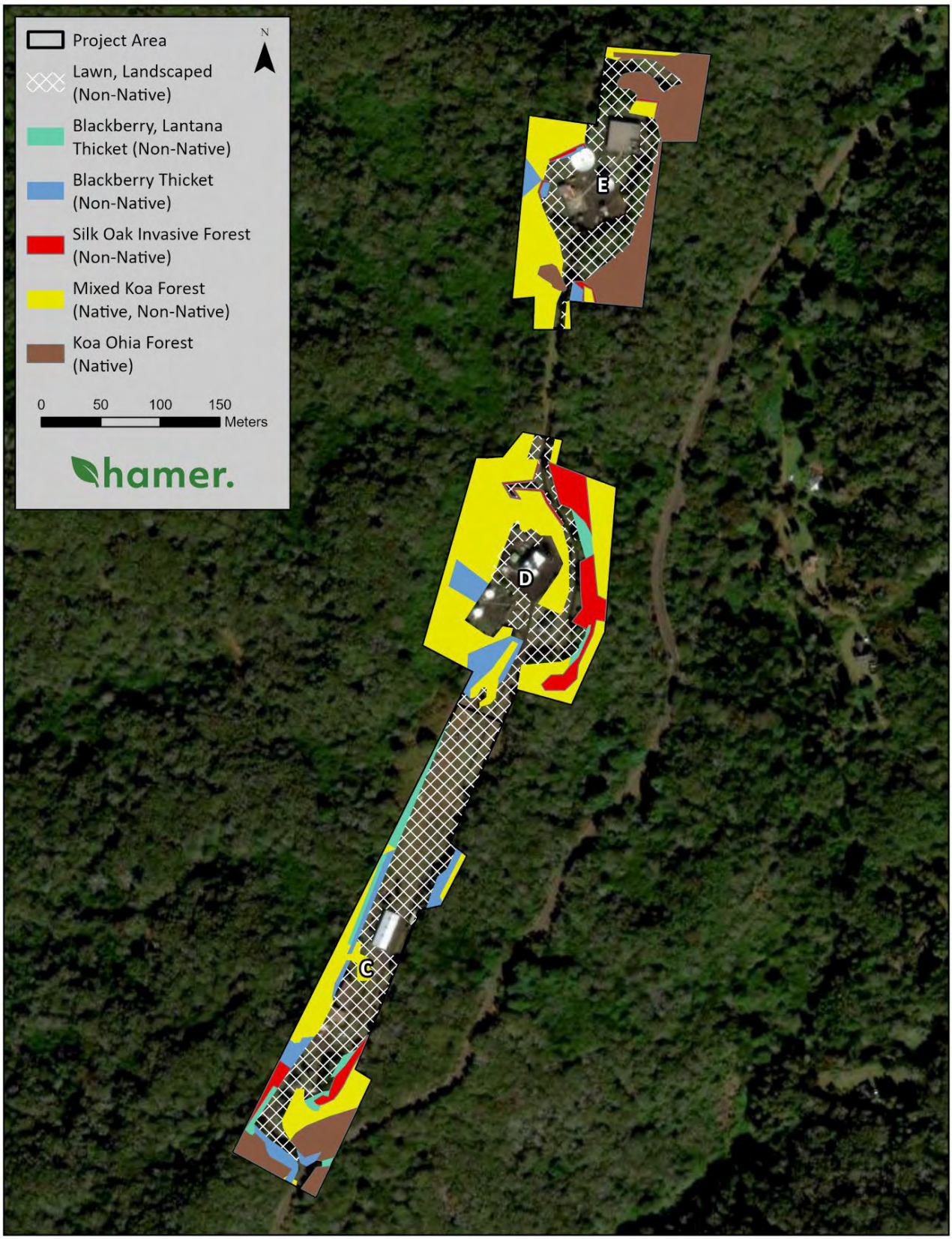

Figure 4-1. Vegetation Cover Types within the North KPGO Study Area, Kaua‘i, Hawai‘i.

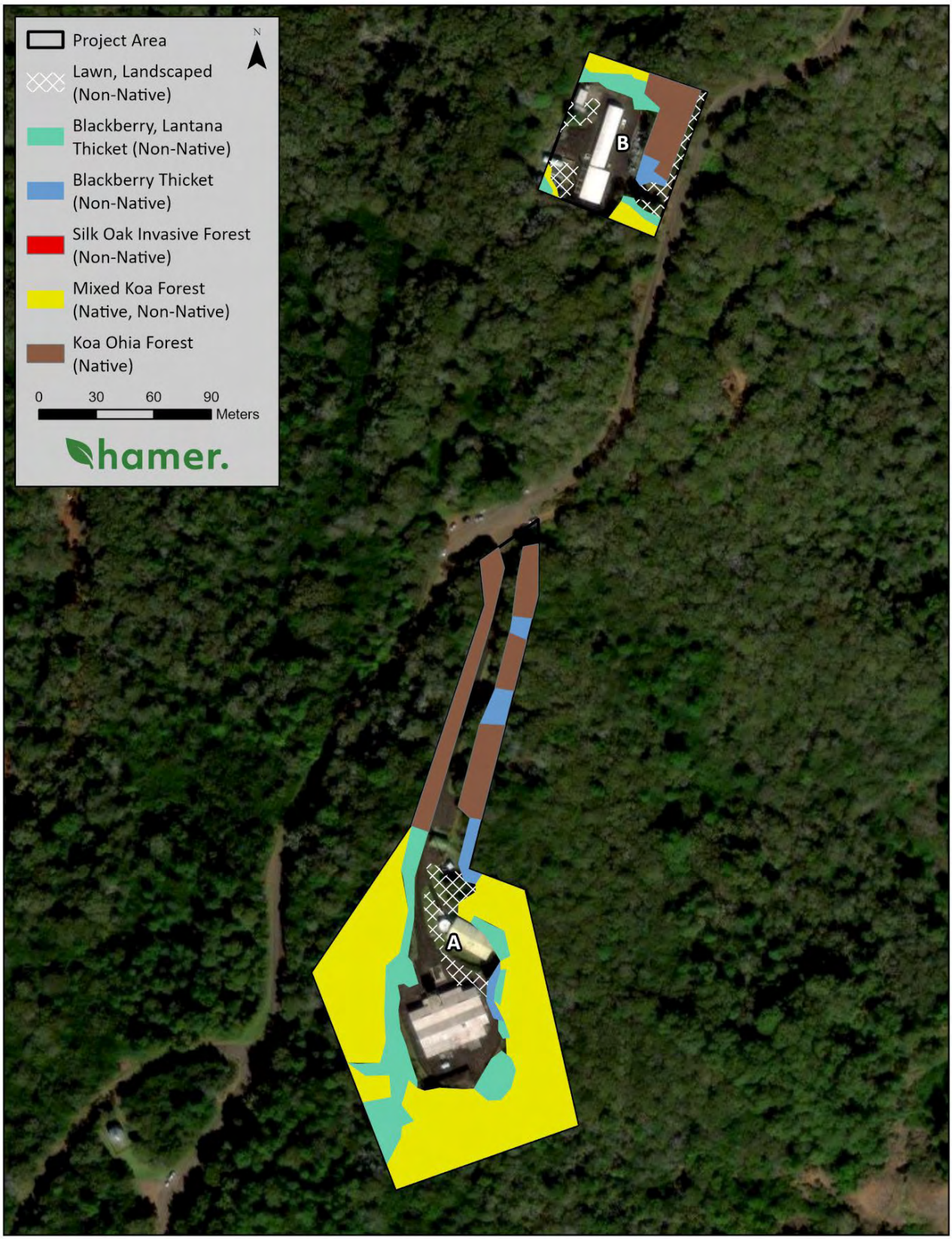

Figure 4-2. Vegetation Cover Types Mapped within the South KPGO Study Area, Kaua‘i, Hawai‘i.

Grass-forb Meadow, Lawn, Landscaped

This cover type includes kikuyu grass- (*Cenchrus clandestinus*) dominated areas with weedy forbs hairy catsear (*Hypochaeris radicata*), narrow leaved plantain (*Plantago lanceolata*), and grasses maintained as lawn by regular mowing, along the access road, tower, building, and satellite structures in Sites A, C, D, and E (Appendix C). Grass-forb meadow areas have a more diverse array of weedy, non-natives including: Australian daisy, bushy bluestem, smutgrass (*Sporobolus indicus*), yellow foxtail grass (*Setaria parviflora*), and Glenwood grass (*Sacciolepis indica*), with other weedy annual and low growing perennial forbs. The largest meadow is within central Site C, and used by the State of Hawaiʻi for helicopter-based equipment and people transfers. The meadow area is periodically mown and contains some seedling and patchy shrubs at the edges. Smaller meadow areas are in northern Site E and central Site D.

A variety of cultivated plants are found within the KPGO study area from a small grove of Methley plums (*Prunus salicina*) and Asian pear (*Pyrus pyrifolia* var. *culta*) trees in Site E, domestic pear (*Pyrus communis*), plums, avocado (*Persea americana*), and plantains (*Musa x paradisiaca*) in Site B, to shrub and flower beds near parking strips of hydrangea, roses and calla lily with some weedy forbs and grasses in Sites A and E. Mature avocado trees are found adjacent to parking areas and installation buildings in south and central Site C, and Site E.

Blackberry Thicket

Dense non-native Florida blackberry thickets were found between forest and maintained areas of the KPGO study area. This cover type co-occurs with other invasive shrubs like fire tree, lantana, Chinese privet, fuschias (*Fuschia magellanica, F. boliviana*), Australian daisy (*Erigeron karvinskianus*) and grasses bushy bluestem (*Andropogon glomeratus*), and molasses grass (*Melinis minutiflora*). These weedy thickets occur in lower Site D, Site C surrounding the central meadow and west fenceline, and central Site A on steep slopes.

Blackberry, Lantana Thicket

Blackberry and lantana thickets include many of the same non-native associated species as the blackberry thickets but tend to have taller vegetation from the dense lantana shrubs, and blackberry growing on top. Chinese privet, seedling strawberry guava, and fire tree are common with Australian daisy, and grasses in groundcover. These scrub-shrub thickets occur in central Site A outside of the fence, northern Site B, patches in central Site C, and lower Site D.

Silk Oak, Lantana, Blackberry Invasive Forest

This forested vegetation type occurs in narrow bands between blackberry, lantana thickets and mixed koa, non-native forest areas. Invasive silk oak (*Grevillea robusta*), is the dominant tree with an understory of lantana, blackberry and strawberry guava with sparse grasses and forbs, including Australian daisy and molasses grass. This invasive non-native forest occur in narrow bands within southern Site C, eastern Site D and southern Site E.

Mixed Koa, Non-native Forest

This forest is dominated by native koa trees, and also contains sparse ōhia, and other native trees and shrubs. Common non-native species include silk oak, paperbark (*Melaleuca quinquenervia*), and Taiwan cherry (*Prunus campanulata*) with understory of invasive strawberry guava, sometimes in dense monotypic patches, shrubs like Chinese privet, and Japanese honeysuckle, and sparse grasses like velvet grass (*Holcus lanatus*) and forbs. The edges of these forests contain denser patches of non-native species like fire tree, lantana and

Florida blackberry. This forest type occurs throughout Site A, in Site B and western portions of Sites C, D and E.

Koa- ʻŌhiʻa Mixed Montane Mesic Forest

This forest is dominated by native trees koa (*Acacia koa*) and ōhia (*Metrosideros polymorpha* var. *glaberrima*) with a mixed native and non-native understory of ʻIliahi (*Santalum freycinetianum*) and smaller trees, and shrubs like olena (*Coprosma waimeae*), colicwood (*Myrsine* spp.), A`ali`i (*Dodonaea viscosa*) and vining maile (*Alyxia stellata*), with sparse ferns, forbs, and sedges. Common understory species include uki or forest sawsedge (*Gahnia beecheyi*), ʻukiʻuki (*Dianella sandwicensis*), ferns, and Meyen's and O'ahu sedge (*Carex meyenii, C. wahuensis*). The most intact of these forest areas occur in north and east Site E, north Site D, lower Site C and small areas of Site B and northern Site A.

5. Discussion

This section provides further details on special status species documented during the vegetation surveys.

5.1 Kōpiko (Psychotria grandiflora)

Federally endangered, kōpiko plants occur within a narrow band of koa and ōhia montane mesic to wet forest and are endemic to the Island of Kauaʻi, with most of the fewer than fifty remaining trees found within Kōkeʻe State Park (USFWS 2017). The small population of 5 plants within the KPGO study area shows a similar trend of decline in numbers and immediate threats include habitat degradation from ungulates and herbivory by insects (Appendix B). Other populations of kōpiko face these same threats as well as herbivory by rodents (USFWS 2017). Within Kōkeʻe State Park, two populations have been fenced to protect them from ungulates, and fencing and maintaining a fence around this population would similarly provide protection to these plants (USFWS 2017). A fenced enclosure could provide additional space for native plant outplantings to increase native species diversity and protect the population from invasive plant encroachment. Herbivory by insects was noted as a threat to four other populations of this plant, and treatment with insecticide – under consultation with Kauaʻi PEPP, may also be beneficial to this population's recovery. Finally, although no evidence of herbivory by rodents was observed, placement of a good nature rodent trap in the vicinity of the population may be useful to ensure no herbivory takes place.

5.2 Invasive Species

Invasive species common to forest areas and shrub edges in the KPGO study area include strawberry guava, Chinese privet, and fire tree. Shrub areas at the edge of forest and meadow areas are dominated by invasive species Florida blackberry and lantana with small strawberry guava seedlings and low-growing Australian daisy. Many of the invasive plants and noxious weeds listed in Table 4-2 have limited distribution and numbers of plants and should be prioritized for eradication. Further, kāhili ginger, and narrowleaf firethorn have limited distribution and are KRCP priority invasives for eradication. Although Chinese privet, strawberry guava, and fire tree are widespread on the KPGO study area, coordinating removal actions with KRCP on lands adjacent to Kōkeʻe State Park could provide a meaningful reduction of these weeds.

5.3 Survey Notes and Recommendations

Site D - Restoration

Recent restoration outplanting in the koa kipuka of Site D consisted of twelve individually fenced native trees, grown at Kōkeʻe by Hui Ku and outplanted by Sustainable Resources Group International, Inc. in December 2022. Plants were germinated from local seed stock to preserve local genetics of species evolved to ecotypes historic to the site, and to reduce introduction of alien species and pests. Plants were fenced individually to protect from browse by ungulates, and maintained and monitored for six months, and deemed healthy at the conclusion of the monitoring period. The restoration plantings in Site D were observed during the spring and fall surveys and most continue to appear healthy and growing (Appendix B). This picture-wing fly habitat and native plant restoration site is adjacent to disturbed forest habitat with abundant invasive species including strawberry guava, Chinese privet, and black wattle (*Acacia mearnsii*) with Florida blackberry and lantana in open areas nearby. Monitoring and management of the restoration site for invasive plants and to ensure continued maintenance of enclosures to exclude ungulates is recommended.

KPGO Facilities Trash

At several sites within the KPGO study area, trash from the Navy and NASA facilities was found discarded in the woods, including fluorescent light bulbs and light covers (Sites A & upper D), metal drawer parts (Site D), and other materials that appeared to originate from the facilities and not as trash from recreationalists or hunters.

6. REFERENCES

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APPENDIX A. PLANT SPECIES LIST

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
FABACEAE	Acacia koa	koa	koa		tree	native	x	x	x	x	x	x
FABACEAE	Acacia mearnsii	black wattle		NW	tree	non-native, HI noxious weed				x	x	
PTERIDACEAE	Adiantum hispidulum	rough maidenhair fern			fern	non-native	x	x	x	x		x
BROMELIACEAE	Aechmea sp.	aechmea			forb	non-native, cultivated				x		
ASTERACEAE	Ageratina riparia	spreading mist flower	Hamakua pamakani	NW	forb	non-native, HI noxious weed	x	x	x	x		
ASTERACEAE	Ageratum houstonianum	floss flower	maile honohono		forb	non-native, naturalized	x	x				
POACEAE	Agrostis stolonifera	creeping bentgrass	He'upueo		grass	non-native				x	x	
POACEAE	Aira caryophyllea	silver hairgrass			grass	non-native		x				
RHAMNACEAE	**Alphitonia ponderosa**	**kauila, kauwila**	**kauila, kauwila**	**SOC**	**tree**	**native**	**x**		**x**	**x**		**x**
APOCYNACEAE	Alyxia stellata (was A. olivifomis)	maile	Maile		shrub	native	x	x	x	x		x
POACEAE	Andropogon gerardi	big bluestem			grass	non-native, naturalized		x				
POACEAE	Andropogon glomeratus	bushy bluestem			grass	non-native, naturalized	x	x	x	x	x	x
POACEAE	Anthoxanthum nitens	sweet grass			grass	non-native			x	x	x	x
POACEAE	Anthoxanthum odoratum	sweet vernal grass			grass	non-native, naturalized				x	x	
EUPHORBIACEAE	Antidesma platyphyllum	hame	Hame		shrub /tree	native, endemic	x	x	x	x		x
ASPLENIACEAE	Asplenium macraei	Iwaiwa lau lii	Iwaiwa lau lii		fern	native		x		x		x
ASPLENIACEAE	Asplenium normale	asplenium fern			fern	native					x	
ASPLENIACEAE	Asplenium polyodon	spleenwort, punana manu			fern	native				x	x	x
ASPLENIACEAE	Asplenium praemorsum	asplenium fern			fern	native				x	x	
POACEAE	Axonopus fissifolius	common carpetgrass			grass	non-native	x	x	x	x	x	x
ASTERACEAE	Bidens pilosa	hairy beggarticks	k, k nehe, k pipili, nehe		forb	non-native, naturalized	x	x		x		x

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
BLECHNACEAE	Blechnum appendiculatum	palm fern			fern	non-native, naturalized	x		x	x	x	x
BLECHNACEAE	Blechnum norfolkense (syn. Doodia kunthiana)	Kunth's hacksaw fern	okupukupu		fern	native, endemic		x	x	x		x
RUBIACEAE	Bobea brevipes	`Ahakea	`Ahakea		tree	native	x				x	x
NYCTAGINACEAE	Boerhavia coccinea	scarlet spiderling			forb	non-native	x	x		x		
POACEAE	Briza minor	lesser quaking- grass			grass	non-native						x
POACEAE	Bromus catharticus	rescue grass			grass	non-native		x		x	x	
POACEAE	Bromus hordeaceus	soft chess			grass	non-native	x		x	x		
BUDDLEJACEAE	Buddleia asiatica	dogtail		KISC	shrub	non-native, invasive		x		x		
BUDDLEJACEAE	Buddleia madagascariensis	smoke bush		KISC	shrub	non-native, invasive					x	
FABACEAE	Cajanus kerstingii (was C. cajan)	pigeon pea			shrub	non-native, naturalized				x		
ASTERACEAE	Calyptocarpus vialis	straggler daisy			sub-shrub	non-native	x		x	x		x
LAMIACEAE	Cantinoa mutabilis	tropical bushmint			forb	non-native		x				
CYPERACEAE	Carex meyenii	Meyen's sedge			sedge	native	x	x	x	x	x	x
CYPERACEAE	Carex wahuensis	O'ahu sedge			sedge	native	x	x	x	x	x	x
OROBANCHACEAE	Castilleja arvensis	field indian paintbrush			forb	non-native, naturalized		x		x		
POACEAE	Cenchrus clandestinus (was Pennisetum clandestinum)	Kikuyu grass			grass	non-native	x	x	x	x	x	x
POACEAE	Cenchrus echinatus	field sandbur			grass	non-native				x	x	
GENTIANACEAE	Centaurium erythraea ssp. erythraea	bitter herb, European centaury			forb	non-native	x	x		x	x	
CARYOPHYLLACEAE	Cerastium fontanum ssp. triviale	Common mouse-ear chickweed			forb	non-native, naturalized				x		
FABACEAE	Chamaecrista nictitans var. glabrata	partridge pea	lauki		forb	non-native	x	x		x		

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
ARALIACEAE	Cheirodendron platyphyllum	lapalapa	lapalapa		shrub /tree	native, Indigenous						x
ARALIACEAE	Cheirodendron trigynum	olapalapa	olapalapa		tree	native, Indigenous	x					x
POACEAE	Chloris barbata	Swollen fingergrass			forb	non-native	x			x		x
POACEAE	Chrysopogon aciculatus	golden beardgrass	mnienie ‘ula		grass	non-native	x		x			x
LAURACEAE	Cinnamomum burmanni	cinnamon, Padang cassia			tree	non-native, naturalized		x				
ASTERACEAE	Cirsium vulgare	bull thistle	pua kala	KISC	forb	non-native, weed	x				x	
EUPHORBIACEAE	Claoxylon sandwicense	po'ola	po'ola		shrub /tree	native, Indigenous	x			x		x
CUCURBITACEAE	Coccinia grandis	ivy gourd, tam lung		NW, KISC	vine	non-native, naturalized		x				
PTERIDACEAE	Coniogramme pilosa	loulu	loulu		fern	native, Indigenous					x	
ASTERACEAE	Conyza canadensis	Canadian horseweed			forb	non-native		x		x		
RUBIACEAE	Coprosma waimeae	olena coprosma	Olena		shrub /tree	native, endemic		x	x	x	x	x
LILIACEAE	Cordyline fruticosa (syn. C. terminalis)	ti plant	ti		shrub	non-native	x	x	x	x	x	x
CORYNOCARPACEAE	Corynocarpus laevigatus	karaka nut			shrub /tree	non-native	x	x	x			
IRIDACEAE	Crocosmia × crocosmiiflora	montbretia			forb	non-native, naturalized				x	x	
FABACEAE	Crotalaria incana	fuzzy rattlepod	kkaehoki, kolomona		forb/shrub		x			x		
LAURACEAE	Cryptocarya mannii	holio	holio		tree	native, endemic				x	x	x
CUPRESSACEAE	Cryptomeria japonica	Japanese cedar			tree	non-native		x				
APIACEAE	Cyclospermum leptophyllum	fir-leaved celery			forb	non-native, naturalized	x	x		x		x
POACEAE	Cynodon dactylon	Bermuda grass	manienie		forb	non-native	x	x	x	x	x	x

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
CYPERACEAE	Cyperus meyenianus	Meyen's flatsedge			sedge	non-native, naturalized		x		x	x	x
CYPERACEAE	Cyperus polystachyos	manyspike flatsedge			sedge	native	x	x		x	x	
POLYPODIACEAE	Cyrtomium caryotideum	holly fern			fern	native					x	
DRYOPTERIDACEAE	Cyrtomium falcatum	holly leaf fern			fern	non-native			x	x		x
POACEAE	Dactylis glomerata	orchardgrass			grass	non-native, naturalized	x	x	x	x	x	x
FABACEAE	Desmanthus pernambucanus	slender mimosa			shrub	non-native, naturalized	x			x		
FABACEAE	Desmodium triflorum	Three-flowered beggarweed			forb	non-native, naturalized	x	x		x		
LILIACEAE	Dianella sandwicensis	‘uki‘uki	‘uki‘uki, ‘uki		forb	native	x	x	x	x	x	x
GLEICHENIACEAE	Dicranopteris linearis	uluhe	uluhe		fern	native	x			x	x	x
POACEAE	Digitaria ciliaris	Henry's crabgrass	kukaepua‘a		grass	non-native, naturalized	x			x	x	x
POACEAE	Digitaria eriantha	Pangola grass, woolly fingergrass			grass	non-native, naturalized	x	x		x	x	x
POACEAE	Digitaria setigera	East Indian crabgrass	kukae pua‘a, mau‘u		grass	non-native	x		x	x		
SAPINDACEAE	Dodonaea viscosa	Florida hopbush	A`ali`i		shrub	native	x	x		x	x	x
ASPARAGACEAE	Dracaena aurea (syn. Pleomele a.)	golden hala pepe	Halapepe		tree	native, endemic		x		x	x	x
DRYOTERIDACEAE	Dryopteris fuscoatra	crowned woodfern	`I`i		fern	native, Indigenous	x		x	x	x	
DRYOTERIDACEAE	Dryopteris glabra	kilaw	Kilau		grass	non-native, naturalized	x		x	x	x	x
POACEAE	Echinochloa crus-galli	barnyard grass			grass	non-native				x		
ELAEOCARPACEAE	Elaeocarpus bifidus	kalia			tree	non-native, Indigenous				x	x	
PRIMULACEAE	Embelia pacifica	kilioe	kilioe		liana	native, endemic				x		
ASTERACEAE	Emilia fosbergii	Florida tasselflower	pualele		forb	non-native	x	x		x	x	x

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
ASTERACEAE	Emilia sonchifolia	lilac tasselflower			forb	non-native	x	x				
POACEAE	Eragrostis tenella (syn. E. amabilis v. tenella)	lovegrass			grass	native		x		x	x	x
POACEAE	Eragrostis variabilis	lovegrass	kalamālō, kāwelu		grass	native, endemic	x			x		x
ASTERACEAE	Erigeron canadensis	horseweed			forb	non-native, naturalized		x		x		
ASTERACEAE	Erigeron karvinskianus	Australian daisy		KISC	forb	non-native, invasive	x	x	x	x	x	x
GERANIACEAE	Erodium cicutarium	alfilaria, pin clover			forb	non-native	x			x	x	
MYRTACEAE	Eucalyptus camaldulensis	red gum			tree	non-native	x				x	
EUPHORBIACEAE	Euphorbia atrococca	koko	koko		tree	native, kauai endemic				x		
EUPHORBIACEAE	Euphorbia hirta (was Chamaesyce h.)	hairy spurge			forb	non-native	x			x	x	x
EUPHORBIACEAE	Euphorbia prostrata	green creeping spurge			forb	non-native		x				
EUPHORBIACEAE	Euphorbia thymifolia	chickenweed			forb	non-native		x		x		
POACEAE	Festuca bromoides (was Vulpia b.)	rat's-tail fescue			grass	non-native, naturalized				x	x	x
POACEAE	Festuca sp.	fescue			grass	non-native, naturalized				x		x
MORACEAE	Ficus edulis	edible fig			tree	non-native			x			
ROSACEAE	Fragaria vesca	strawberry			forb	non-native					x	x
ASPARAGACEAE	Furcraea foetida	Mauritius hemp, malina			forb	non-native		x				
ONAGRACEAE	Fuschia boliviana	Bolivian fuschia		KISC	shrub	non-native		x		x	x	x
ONAGRACEAE	Fuschia magellanica	hummingbird fuschia			shrub	non-native		x		x		
CYPERACEAE	Gahnia beecheyi	forest sawsedge	Uki		sedge	native	x	x	x	x	x	x
ASTERACEAE	Galinsoga parviflora	gallant soldier			forb	non-native		x				
ASTERACEAE	Gamochaeta purpurea	spoonleaf purple everlasting			forb	non-native	x	x	x	x	x	x
GERANIACEAE	Geranium homeanum	cranesbill			forb	non-native		x	x	x	x	

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
PROTEACEAE	Grevillea robusta	silver oak	‘oka kilika		tree	non-native, naturalized	x	x		x	x	
FABACEAE	Guilandina major (was Caesalpinia m.)	yellow nickers, kakalaioa	kakalaioa		shrub	non-native						x
AQUIFOLIACEAE	Hawai'i holly	Ilex anomala	`Aiea		tree		x		x	x		x
ZINGIBERACEAE	Hedychium coronarium	White ginger			forb	non-native, naturalized		x		x	x	
ZINGIBERACEAE	Hedychium gardnerium	kāhili ginger		KISC	forb	non-native, invasive	x	x		x		
POACEAE	Heteropogon contortus	pili grass	pili, lule		grass	native, Indigenous	x	x		x		x
POACEAE	Holcus lanatus	velvet grass			grass	non-native, naturalized		x		x	x	x
HYDRANGEACEAE	Hydrangea macrophylla	French hydrangea			shrub	non-native	x	x				
POACEAE	Hyparrhenia rufa	thatching grass			grass	non-native, naturalized	x			x	x	
ASTERACEAE	Hypochaeris glabra	smooth cat's-ear			forb	non-native	x	x		x		
ASTERACEAE	Hypochaeris radicata	hairy cat's-ear			forb	non-native	x	x	x	x	x	x
LAMIACEAE	Hyptis pectinata	Comb hyptis		NW	forb	non-native, naturalized		x		x		
FABACEAE	Indigofera suffruticosa	Indigo			forb, vine	non-native	x				x	
CONVOLVULACEAE	Ipomoea indica	indigo morning glory, oceanblue morning-glory	Koali 'awa, koali 'awahia		vine	non-native					x	
JUNCACEAE	Juncus tenuis	pathfinder rush			rush	non-native, naturalized				x		x
CUPRESSACEAE	Juniperus virginiana	Eastern red juniper			tree	non-native, cultivated			x			
RUBIACEAE	Kadua affinis (syn. Hedyotis terminalis)	variable starviolet	manono		shrub /tree	native, endemic	x	x		x	x	x
CYPERACEAE	Kyllinga brevifolia (was Cyperus brevifolius)	green kyllinga			sedge	non-native, naturalized		x		x		x
POACEAE	Lachnagrostis filiformis (syn. Agrostis avenaceae)	heupueo	heupueo		grass	non-native				x		x

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
VERBENACEAE	Lantana camara	lantana	lkana, l'au kalakala	KISC	shrub	non-native		x	x	x	x	
POLYPODIACEAE	Lepisorus thunbergianus (was Pleopeltis thunbergiana)	weeping fern	Pakahakaha		fern	native, Indigenous		x				
EPACRIDACEAE	Leptecophylla tameiameiae	pūkiawe	pūkiawe, 'a'ali'i mahu		shrub	native, Indigenous		x	x	x	x	x
OLEACEAE	Ligustrum sinense	Chinese privet		KISC	shrub	non-native, invasive		x	x	x	x	x
POACEAE	Lolium arundinaceum	tall fescue			grass	non-native, naturalized		x	x	x	x	x
POACEAE	Lolium perenne	perennial ryegrass			grass	non-native, naturalized		x				
CAPRIFOLIACEAE	Lonicera japonica	Japanese honeysuckle		KISC	liana	non-native		x	x	x	x	x
JUNACACEAE	Luzula hawaiiensis	Wood rush			rush	native						x
PRIMULACEAE	Lysimachia arvensis (was Anagallis a.)	scarlet pimpernel			forb	non-native	x	x		x	x	x
PRIMULACEAE	Lythrum maritimum	pukamole	pukamole		shrub	native		x		x	x	x
FABACEAE	Medicago lupulina	black medick			forb	non-native, naturalized	x		x			x
FABACEAE	Medicago polymorpha	burclover			forb	non-native			x	x		
MYRTACEAE	Melaleuca quinquenervia	Paperbark			tree	non-native, naturalized	x				x	x
MELASTOMATACEAE	Melastoma malabathricum subsp. Malabathricum (was M. candidum)	Asian melastome		NW	shrub /tree	non-native	x	x			x	
RUTACEAE	Melicope anisata	mokihana			tree	native	x		x	x		x
RUTACEAE	Melicope barbigera	U`ahiapele	U`ahiapele		tree	native	x	x	x	x		x
RUTACEAE	Melicope ovata	alani, eggshape melicope	alani		tree	native				x	x	x
RUTACEAE	Melicope penduncularis	boxfruit alani	alani		tree	native		x		x	x	x

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
POACEAE	Melinis minutiflora	molasses grass			grass	non-native, naturalized	x	x	x	x	x	x
LAMIACEAE	Mentha spicata	spearmint			forb	non-native, cultivated		x				
MYRTACEAE	Metrosideros polymorpha var. glaberrima	`Ohia	`Ohia lehua		tree	native	x	x	x	x	x	x
POACEAE	Microlaena stipoides (was Ehrharta s.)	weeping grass			grass	non-native						x
DENNSTAEDTIACEAE	Microlepia strigosa	palapalai	palapalai		fern	native	x			x	x	x
CUCURBITACEAE	Momordica charantia	balsam pear, bitter melon			forb, vine	non-native, invasive	x	x				
MUSACEAE	Musa x paradisiaca	plantain	mara		tree	non-native, cultivated	x		x			
MYOPORACEAE	Myrica faya (syn. Morella f.)	Fire tree		NW	shrub /tree	non-native, noxious weed	x	x	x	x	x	x
MYRSINACEAE	Myrsine alyxifolia	forest colicwood			tree	native, endemic	x	x		x	x	x
MYRSINACEAE	Myrsine lanaiensis	Lanai colicwood, Kolea	Kolea		tree	native, Indigenous	x		x	x		x
MYRSINACEAE	Myrsine sandwicensis	Kolea lau li l i	Kolea lau li l i		tree	native, Indigenous				x	x	
POLYPODIACEAE	Nephrolepis brownii (syn. N. multiflora)	Asian swordfern	Kupukupuni'ani'au		fern	non-native	x	x	x		x	
OLEACEAE	Notolaea sandwicensis (syn. Nestegis s.)	Hawai‘i olive			tree	native, Indigenous	x			x	x	x
APOCYNACEAE	Ochrosia kauaiensis	holei	holei		tree	native, endemic					x^R	
OLEACEAE	Olea europaea	olive	‘oliwa, ‘oliwa haole		tree	non-native, naturalized	x				x	x
POACEAE	Oplismenus hirtellus	basketgrass	honohono kukui		grass	non-native, naturalized	x				x	x
OXALIDACEAE	Oxalis corniculata	yellow wood sorrel	‘ihi ‘ai, ‘ihi ‘awa		forb	non-native	x	x	x	x	x	

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
OXALIDACEAE	Oxalis debilis	pink wood sorrel	‘ihi pehu		forb	non-native	x					x
POACEAE	Panicum nephelophilum	konakona	konakona		grass	native, endemic				x		x
MORACEAE	Paratrophis pendulina (was Streblus pendulinus)	A`ai`a	A`ai`a		shrub /tree	native	x			x	x	x
POACEAE	Paspalum conjugatum	ti grass, hilograss	ti grass		grass	non-native, naturalized				x	x	x
POACEAE	Paspalum dilatatum	browntop millet, dallisgrass			grass	non-native, naturalized	x	x		x		
POACEAE	Paspalum fimbriatum	Panama paspalum, Colombia grass			grass	non-native, naturalized	x			x		
POACEAE	Paspalum urvillei	Vaseygrass			grass	non-native, naturalized		x		x		x
PASSIFLORACEAE	Passiflora edulis	Passion fruit, liliko'i	liliko'i		liana	non-native, naturalized		x		x		
LAURACEAE	Persea americana	avocado			tree	non-native, cultivated	x	x	x	x		x
POLYGONACEAE	Persicaria capitata	pink-head knotweed, heartweed			forb	non-native, naturalized		x				x
EUPHORBIACEAE	Phyllanthus airy-shawii (was P. debilis)	phyllanthus weed	Niruri		forb	non-native	x				x	x
SOLANACEAE	Physalis peruviana	Chinese gooseberry, poha	poha		forb	non-native, naturalized					x	
PITTOSPORACEAE	Pittosporum glabrum	hoawa	hoawa		tree	native, endemic	x	x				
PITTOSPORACEAE	Pittosporum kauaiense	Kaua‘i cheesewood			tree	native, endemic					x	
SAPOTACEAE	Planchonella sandwicensis (syn. Pouteria s.)	ala'a	ala'a		shrub /tree	native, endemic	x	x		x	x	x
PLANTAGINACEAE	Plantago lanceolata	narrow leaved plantain			forb	non-native, naturalized		x	x	x	x	x
PLANTAGINACEAE	Plantago major	common plantain	laukahi		forb	non-native, naturalized				x		

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
ASTERACEAE	Pluchea carolinensis	sourbush, cure for all			shrub /tree	non-native, naturalized	x	x	x	x	x	
CARYOPHYLLACEAE	Polycarpon tetraphyllum	four-leaf allseed			forb	non-native, naturalized	x		x			x
POLYGONACEAE	Polygonum aviculare	prostrate knotweed			forb	non-native, naturalized						x
ARALIACEAE	Polyscias hawaiensis (syn. Tetraplasandra h.)	Hawai‘i `ohe	`ohe`ohe		tree	native, endemic				x	x	
ARALIACEAE	Polyscias waimeae	`ohe kiko `ola	`ohe kiko`ola		tree	native, endemic				x	x[R]	
PORTULACACEAE	Portulaca oleracea	pusley, pigweed	akulikuli kula, ihi		forb	non-native, naturalized	x	x				
ARECACEAE	**Pritchardia minor**	**loulu, Alakai Swamp pritchardia**	**loulu**	**SOC**	**tree**	**native**					**x[R]**	
ROSACEAE	Prunus salicina	Methley plum tree			tree	non-native, cultivated	x	x	x	x	x	x
ROSACEAE	Prunus campanulata	Taiwan cherry			tree	non-native		x	x	x	x	x
ASTERACEAE	Pseudognaphalium luteoalbum	cud weed			forb	non-native		x		x	x	
MYRTACEAE	Psidium cattleyanum	strawberry guava	waiawi ‘ula‘ula	KISC	shrub /tree	non-native, invasive	x	x	x	x	x	x
MYRTACEAE	Psidium guajava	common guava	kuawa, kuawa ke‘oke‘o		tree	non-native	x			x		
PSILOTACEAE	Psilotum nudum	upright whiskfern	moa, moa nahele		fern	native	x	x	x	x		x
RUBIACEAE	**Psychotria grandiflora**	**kōpiko**	**kōpiko**	**FE**	**shrub /tree**	**native, endemic**						**x**
RUBIACEAE	Psychotria greenwelliae	Kaua‘i wild coffee	Kopiko		tree	native, endemic	x		x	x	x	x
RUBIACEAE	Psychotria mariniana	forest wild coffee	Kopiko		tree	native, Indigenous	x		x	x	x	x
RUBIACEAE	Psydrax odoratus (syn. P. odorata)	alahe‘e	alahe‘e		shrub	native, Indigenous					x[R]	

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
DENNSTAEDTIACEAE	Pteridium decompositum	Hawaiian bracken fern	kīlau		fern	native, Indigenous	x	x	x	x		x
ROSACEAE	Pyracantha angustifolia	narrowleaf firethorn		KISC	shrub	non-native, invasive	x		x	x	x	
ROSACEAE	Pyrus pyrifolia var. culta	Asian pear			tree	non-native, cultivated			x			x
ROSACEAE	Pyrus communis	pear			tree	non-native, cultivated	x		x			
CYPERACEAE	Rhynchospora rugosa	claybank beaksedge, Pu'uko'a	Pu'uko'a		sedge	native				x		
RUBIACEAE	Richardia brasiliensis	tropical Mexican clover			forb	non-native	x	x				x
EUPHORBIACEAE	Ricinus communis	castor, palma cristi	pʻaila, kaʻapeh		shrub	non-native, invasive	x					x
PETIVERIACEAE	Rivina humilis	coral berry, rouge plant			shrub	non-native, naturalized					x	x
ROSACEAE	Rosa sp. (cultivar)	cultivated rose			shrub	non-native	x				x	x
ROSACEAE	Rubus argutus	Florida blackberry		NW	shrub	non-native, invasive	x	x	x	x	x	x
ROSACEAE	Rubus rosifolius	thimbleberry	olaa		shrub	non-native						x
ACANTHACEAE	Ruellia simplex	Mexican petunia			forb	non-native					x	
POACEAE	Sacciolepis indica	Glenwood grass			grass	non-native, naturalized	x	x		x	x	
LAMIACEAE	Salvia rosmarinus	rosemary			shrub	non-native, cultivated					x	
SANTALACEAE	Santalum freycinetianum	`Iliahi, sandalwood	`Iliahi		tree	native	x	x	x	x	x	x
GOODENIACEAE	Scaevola procera	naupaka kuahiwi	Naupaka kuahiwi		tree	native	x	x		x	x	x
POACEAE	Schizachyrium condensatum (was Setaria gracilis)	tufted beardgrass			grass	non-native, naturalized	x	x		x		
POLYGALACEAE	Senega incarnata (syn. Polygala paniculata)	milkwort, root beer plant			forb	non-native, naturalized		x		x		x
FABACEAE	Sesbania tomentosa	Oahu riverhemp	`ohai		shrub	native				x	x	

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
POACEAE	Setaria parviflora	yellow foxtail, perennial foxtail	mau‘ Kaleponi		grass	non-native, naturalized	x	x		x	x	x
MALVACEAE	Sida fallax	‘ilima	‘ilima		shrub	native	x			x		
ASTERACEAE	Sonchus asper	prickly cow thistle			forb	non-native, naturalized			x			
ASTERACEAE	Sonchus oleraceus	sow thistle	pualele		forb	non-native, naturalized	x	x	x			x
FABACEAE	Sophora chrysophylla	mamani	mamani		shrub /tree	native		x		x		
RUBIACEAE	Spermacoce rubescens (was S. assurgens)	buttonweed			subsh rub	non-native	x	x		x		x
CYATHEACEAE	Sphaeropteris cooperi	Australian tree fern		KISC	tree	non-native, invasive		x				x
ASTERACEAE	Sphagneticola trilobata	wedelia			subsh rub	non-native, naturalized	x	x		x	x	
POACEAE	Sporobolus indicus	smutgrass, West Indian dropseed			grass	non-native, naturalized		x	x	x	x	x
CARYOPHYLLACEAE	Stellaria media	common chickweed			forb	non-native, naturalized		x		x		x
ASTERACEAE	Taraxacum sect. Taraxacum (was T. officinale)	dandelion, lau-lele	lau-lele		forb	non-native, naturalized	x	x	x	x	x	x
ASPLENIACEAE	Thelypteris parasitica	woodfern			fern	non-native	x			x		x
FABACEAE	Trifolium campestre	field clover			forb	non-native, naturalized				x		x
FABACEAE	Trifolium hybridum	alsike clover			forb	non-native, naturalized			x	x		
FABACEAE	Trifolium repens	white clover			forb	non-native, naturalized	x	x	x	x		x
TROPAEOLACEAE	Tropaeolum majus	garden nasturtium			forb	non-native		x		x		
ERICACEAE	Vaccinium dentatum	ohelo	ohelo		shrub	native				x		x
VERBENACEAE	Verbena litoralis	vervain	Ha'uoi, owi		forb	non-native	x	x	x	x		x
ASTERACEAE	Verbesina encelioides	butter daisy			forb	non-native		x		x		

Family	Scientific Name	Common Name	Hawaiian Name	Status	Plant Type	Nativity	Previous KPGO Detection	Site A	Site B	Site C	Site D	Site E
STERCULIACEAE	Waltheria indica	‘uhalo	‘uhalo		shrub	non-native			x	x		
THYMELAECEAE	Wikstroemia furcata	forest false ohelo	Akia		tree	native, endemic	x	x	x	x		x
FLACOURTIACEAE	Xylosma hawaiensis	Hawai'i brushholly	maua		tree	native, Indigenous	x			x	x	x
ARACEAE	Zantedeschia aethiopica	calla lily			forb	non-native, cultivated		x			x	
RUTACEAE	**Zanthoxylum kauaense**	**Kaua‘i pricklyash**	**a‘e**	**SOC**	**tree**	**native, Indigenous**	**x**				**x**	
RUTACEAE	Zanthoxylum oahuense	Oahu pricklyash			tree	native, Indigenous				x		

[1]Status: E = Endangered, SOC = Species of Concern, nw = State of Hawai‘i Department of Agriculture designated noxious weed (1992). kisc = Kaua‘i Invasive Species Committee invasive species targeted for removal.

[R] = Restoration area native species outplanted in December 2022 by SRGII and Hui Ku to benefit picture wing fly critical habitat (McFarland 2024).

APPENDIX B. PLANT SURVEY PHOTO LOG

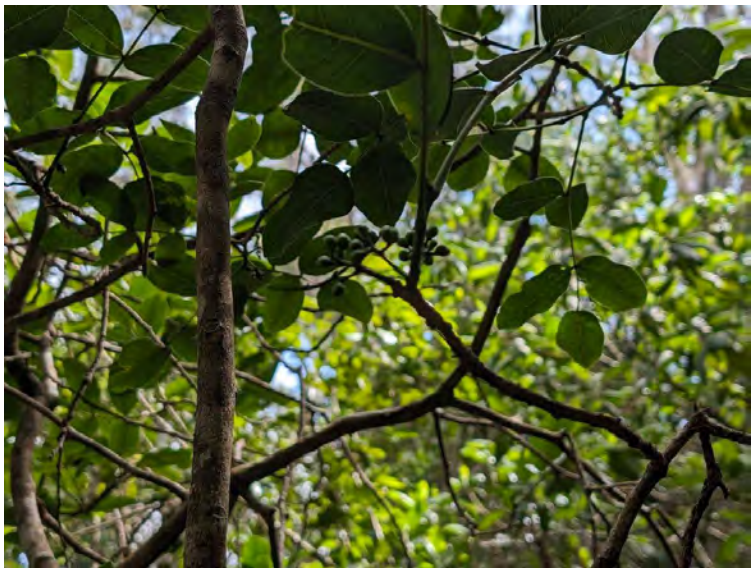
1. Special Status Plants

Kōpiko, *Psychotria grandiflora* (Endangered) - showing individual plants with tags #8 (top left), #10 (top right), #6 (bottom left), #10 tag (bottom right).

Kōpiko, *Psychotria grandiflora* (Endangered) - showing individual plants #3 (left), kōpiko with no tag (right), overview looking North at population (bottom).

Kauila, *Alphitonia ponderosa* (Species of Concern) – Showing #1 Site C, tree (top left) and canopy (top right), #2 Site C, 4.5" dbh tree showing bark and trunk (bottom left), and canopy (bottom right).

Kauila, *Alphitonia ponderosa* (Species of Concern) – Showing #6 in lower Site C, photo of 10-in dbh tree trunk (top left), and tree canopy (top right), Showing #7 in east Site B, photo of tree trunk in hedge (lower left) and tree canopy (lower right).



Kaua‘i prickly ash, a‘e, *Zanthoxylum kauaense* (Species of Concern) – Showing 1 small tree south of Site C (top left), and immature fruits on tree (top right), Showing 5 young trees south of Site B, young seedling (bottom left), and largest individual (bottom right).

2. Invasive Plants

Black wattle, spreading mist flower, smoke bush, bull thistle, Bolivian fuschia, and kāhili ginger (from top left to bottom right).

Lantana, Chinese privet, fire tree, strawberry guava, narrowleaf firethorn, and Florida blackberry with guava in background (from top left to bottom right).

Australian tree fern, castor bean plant, dogtail, and Australian daisy (from top left to bottom right).

APPENDIX C. VEGETATION COVER TYPE PHOTOS

Grass-forb Meadow, Lawn, showing meadow in central Site C (top left, top right), lawn in lower Site D (bottom left). Landscaped, showing Methley plum trees in front of building at Site E (bottom right).

Blackberry, Lantana Thicket. Showing thicket in Site A (top left) and closeup (top right).

Blackberry Thicket in western Site C foreground (bottom).

Silk Oak, Lantana, Blackberry Invasive Forest with lantana and blackberry in foreground and silk oak trees in background in southern Site C.

Mixed Koa, Non-native Forest. In Site D with strawberry guava understory (top left), in Site A with koa and silk oak trees and lantana in understory (top right).

Native Koa – Ōhia Mixed Montane Mesic Forest, in Site C (bottom left), in northern Site E (bottom right).

APPENDIX D. KPGO STUDY AREA OVERVIEW PHOTOS

Site Overview Photos of the KPGO Study Area, Kaua'i, Hawaii.

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Overview 2, Site E. Looking north (top), south (middle), and west (bottom).

Overview 3, Site C. Looking south toward communications tower (top) and west fenceline with trees beyond (bottom).

Overview 4, Site D. Looking into forest showing invasive strawberry guava (top) and native halapepe trees (bottom).

Overview 5, Site D. Dense strawberry guava in background and some native trees.

Overview 6, Site E. Dense, inaccessible forest vegetation dominated by strawberry guava.

Overview 7, Site C. Looking north at Florida blackberry and native ōhia-koa forest from fenceline.

Overview 8, Site A. Looking northwest at koa trees and pūkiawe shrub in foreground and dense guava in background.

Overview 9, Site A. Overview with lantana shrubs and koa and non-native silk oak (*Grevillea robusta*) trees in background.

Overview 10, Site A. Koa-ōhia forest with invasive Chinese privet (*Ligustrum sinense*), and lantana shrubs.

KPGO Fauna Survey Report

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Terrestrial Fauna Final Survey Report of the Kōkeʻe Park Geophysical Observatory

Kauaʻi, Hawaiʻi

Task Order 28
Contract No. 80GSFC21CA008

Prepared for:

GFSC Environmental Planning Group and WFF Center NEPA Group
National Aeronautics and Space Administration
Goddard Space Flight Center
8800 Greenbelt Rd, MD 20771

Nic Frederick, Project Manager
Dawson Ohana, LLC
4100 Market St, Suite 117
Huntsville, AL 35808-3012

Prepared by:

Erin Colclazier
Hamer Environmental, L.P.
P.O. Box 2561
Mt. Vernon, WA 98273
Erin@Hamerenvironmental.com (360) 420-4201

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ACRONYMS AND ABBREVIATIONS

ac	acre
DLNR	Hawaiʻi Department of Land and Natural Resources
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ft	foot
GIS	geographic information system
GPS	global positioning system
Hamer	Hamer Environmental, L.P.
HST	Hawaiʻi Standard Time
HEPA	Hawaiʻi Environmental Policy Act
HRS	Hawaiʻi Revised Statute
INRMP	Integrated Natural Resources Management Plan
KISC	Kauaʻi Invasive Species Council
KPGO	Kōkeʻe Park Geophysical Observatory
m	meter
MBTA	Migratory Bird Treaty Act
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Systems Command
Navy	Department of the Navy
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
PMRF	Pacific Missile Range Facility
SME	Subject Matter Expert
SOW	Statement of Work
USFWS	United States Fish and Wildlife Service
UTM	Universal Transverse Mercator

1. INTRODUCTION

1.1 BACKGROUND

DAWSON contracted Hamer Environmental, L.P. (Hamer) to conduct terrestrial fauna surveys for the National Aeronautics and Space Administration (NASA) at Kōkeʻe Park Geophysical Observatory (KPGO) properties on Kauaʻi, Hawaiʻi. The KPGO study area is approximately 25 acres (ac) and consists of five parcels (Figure 1-1). NASA and the U.S. Department of the Navy (Navy) in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR) are preparing a Real Estate Environmental Impact Statement (EIS) which evaluates the potential environmental consequences of the Navy's and NASA's proposal to retain the use of lands for the Navy's continued and ongoing military testing and training at Pacific Missile Range Facility (PMRF) and NASA's continued operations at KPGO. Existing NASA and Navy real estate agreements with the DLNR are set to expire between 2027 and 2030. The survey results will be used for future project planning, development of avoidance and minimization measures, National Environmental Policy Act (NEPA) analysis, Chapter 343, Hawaiʻi Revised Statutes (HRS) referred to as Hawaiʻi Environmental Policy Act (HEPA) analysis, and/or potential Endangered Species Act (ESA) Section 7 consultation.

Following the project Statement of Work (SOW) issued January 2024, Hamer developed a work plan in April 2024 to identify terrestrial fauna habitat resources in the survey area, and proposed methodology and data collection, reporting, and schedule and personnel for field surveys. Hamer conducted terrestrial fauna surveys for protected fauna species, to identify mammalian and avian predators, and Kauaʻi Invasive Species Committee Priority Pest species (coqui frog [*Eleutherodactylus coqui*], little fire ant [*Wasmannia auropunctata*], and mongoose [*Herpestes javanicus*]) within the KPGO study area. This report summarizes the findings of the 2024 terrestrial fauna surveys over two seasons from April to May (spring) and October (fall). A recent, 2022 terrestrial invertebrate survey, conducted by expert entomologists within the KPGO study area, documented the presence of Hawaiian picture wing fly (*Drosophila musaphilia*) and found a high level of insect biodiversity within the remnant native forest and mixed native non-native forests of the study area (Magnacca 2022).

1.2 PURPOSE OF SURVEY

As stated in the project SOW, the purpose of the terrestrial fauna surveys was to document protected animal species, as well as predator and wildlife pest species within the KPGO study area. The objective of the terrestrial fauna surveys was to identify the faunal resources within the KPGO study area to support environmental evaluations and consultations. A separate study for Hawaiian hoary bat (ʻŌpeʻapeʻa, *Lasiurus semotus*) using acoustic detectors was conducted and findings will be reported separately from this effort.

1.3 SURVEY AREA

Survey areas for terrestrial fauna were developed by KPGO Subject Matter Experts (SMEs) and Hamer. Based on the results of the desktop analysis (Hamer Environmental 2024), specific species were targeted for

surveys using the methodologies presented in Chapter 2. The KPGO study area is 24.9[1] ac and consists of five parcels (listed from north to south), Site E (5.7 ac), Site D (6.5 ac), Site C (6.2 ac), Site B (1.2 ac) and Site A (5.3 ac) (Figure 1-1). The KPGO study area is located between 1,130 and 1,160 m (3,710 ft and 3,800 ft) elevation in Kōkeʻe State Park on the northerly Kaunuohua Ridge east of Mākaha Ridge and the northwestern end of Waimea Canyon (NAVFAC 2023). The KPGO study area is comprised of buildings and other impervious surfaces, as well as mowed lawns in open areas with forest along the property margins. The KPGO study area is located within the Waimea-Kekaha region of the State of Hawaiʻi's Conservation District, within a Resource Subzone, as classified by Chapter 205 of Hawaiʻi Revised Statutes. The KPGO study area is close to the Division of Forestry and Wildlife-managed Kuia Natural Area Reserve, located within a Protected Resource Subzone. Lands surrounding the KPGO study area are primarily used for recreation with trails, campgrounds and scenic overlooks (NAVFAC 2023).

The terrestrial fauna survey area is 19.2 ac, consisting of all lands not comprised of impervious surfaces (roads, buildings) (National Oceanic and Atmospheric Administration [NOAA] 2010). The terrestrial fauna survey area is 79% (15.1 ac) evergreen forest, 6% (1.2 ac) scrub-shrub land covers, and 15% (2.9 ac) developed open space (managed grasses like lawn or low-lying vegetation) (Figure 1-2).

1.4 Special Status Terrestrial Fauna Species With Potential to Occur

Special status fauna with potential to occur in the KPGO study area and details on their known habitat and likelihood of potential habitat presence within the fauna survey area are listed in Table 1-1. This list includes all federal- and state-listed species and federal species of concern previously found or with potential to occur within the KPGO study area (Magnacca 2022, NAVFAC 2023, NAVFAC 2010, USFWS 2024). Fauna species in the State Wildlife Action Plan (SWAP) with potentially suitable habitat in the KPGO study area were also included (DLNR 2015).

Table 1-1. Special Status Fauna Species Known to Occur or with Potential to Occur in the KPGO Study Area, Kauaʻi, Hawaiʻi.

Common Name	Scientific Name	Hawaiian Name	Regulatory Status[1]	Previous Occurrence in the KPGO Study Area?	Habitat
Birds					
Hawaiian Goose	*Branta sandvicensis*	Nēnē	FT, SE	Yes	Variety of habitats such as coastal dunes and grasslands, shrubland, and shrubland-woodland interfaces

[1] This survey acreage (24.9 ac) is slightly larger than the acreage reported in the EIS for PMRF and KPGO Real Estate (April 2025) (23 ac) due to the removal of Site F (included in the ac for Site C above). The original lease noted a Site F; however NASA is not seeking to renew their lease for this site only. Site F was included in this survey, therefore the acreage differs.

Common Name	Scientific Name	Hawaiian Name	Regulatory Status[1]	Previous Occurrence in the KPGO Study Area?	Habitat
Band-rumped Storm-petrel (Hawai‘i DPS)	*Hydrobates castro*	‘Akē‘akē	FE, SE	Yes[2]	Colonies are in steep inland valleys vegetated with shrubs and grasses
Hawaiian Petrel	*Pterodroma sandwichensis*	‘Ua‘u	FE, SE	Yes[2]	Colonies occur in lower-elevation forests dominated by native ‘ōhi‘a trees
Newell’s Shearwater	*Puffinus newelli*	‘A‘o	FT, ST	Yes[2]	Most colonies occur on steep, densely vegetated inland mountains and also nest on sparsely vegetated coastal cliffs along west Kaua‘i
Scarlet Honeycreeper	*Drepanis coccinea*	‘I‘iwi	FT, SE	Yes	Mesic and wet native forest above 1,200 m (4,000 ft)
Mammals					
Hawaiian Hoary Bat	*Lasiurus cinereus semotus*	‘Ōpe‘ape‘a	FE, SE	Yes	Mesic and wet native forest above 1,200 m (4,000 ft)
Insects					
Hawaiian Picture-wing Fly	*Drosophila musaphilia*		FE, SE	Yes[3]	Koa forest within regions of Kōke’e State Park
Hawaiian Picture-wing Fly	*Drosophila sharpi*		FE, SE	No	‘Ohe (*Polyscias hawaiensis*) or Lapalapa (*Cheirodendron* spp.) forest within regions of Kōke’e State Park

[1]Regulatory Status: FE = Federally Endangered, FT = Federally Threatened, SE = State Endangered, ST = State Threatened.
[2]Potential to fly over and/or known to fall-out on base (NAVFAC 2023).
[3]Documented within the KPGO Study Area in Site E (2022) and previously in Site B (2009) (Magnacca 2022).

1.5 Survey Schedule and Personnel

Terrestrial fauna surveys were completed by one biologist between April 28 and May 13, 2024 (spring survey) and between October 11 and 24, 2024 (fall survey), with daily surveys conducted between 6:15 am and 11:00 am for observation point surveys and for fauna habitat surveys until 3:30 pm Hawai‘i Standard Time (HST). Hamer Lead Biologist, Erin Colclazier, conducted vegetation surveys and determined the target special status fauna species most likely to occur in the terrestrial fauna survey area. For all KPGO surveys (vegetation, fauna, and bat). Erin Colclazier was the Project Manager and Kendra Ritchie was the GIS Analyst. Erin Colclazier completed the data analysis and report.

Figure 1-1. Kōkeʻe Park Geophysical Observatory Study Area, Comprised of Five (5) Parcels (Sites A, B, C, D, E) on Kauaʻi, Hawaiʻi.

Figure 1-2. Land Cover Types for Terrestrial Fauna Surveys (all but Impervious [Green]) within the KPGO Study Area on Kaua‘i, Hawai‘i.

2. Survey Methods

2.1 Terrestrial Fauna Survey Methods

Observation points were selected throughout the fauna survey area in all regions anticipated to capture the most representative biological resources present (Figure 2-1). A total of 15 observation point locations were selected: six (6) in evergreen forest, six (6) in scrub-shrub, and three (3) in open-developed habitat types. Potentially occurring special status species targeting those listed in (Table 1-1), and Migratory Bird Treaty Act (MBTA) species were the focus, but all observed fauna were recorded. One Hamer biologist conducted terrestrial fauna surveys for 11 minutes at each of 15 observation points and were surveyed 3 times each in spring and fall, for 6 total visits. Invasive fauna or their sign were documented when observed, with Kaua‘i Invasive Species Council’s (KISC) priority species reported if observed (KISC 2023).

To ensure adequate opportunity for incidental wildlife observations, the Hamer biologist walked between observation points and regularly scanned areas with binoculars when conducting other fieldwork in the survey area. Following the SOW, data was reviewed each day after collection and backed-up. A sub-meter level accuracy GPS (global positioning system) unit (Juniper Geode™) was utilized for sensitive species data collection. All special status fauna data was recorded as specified in the SOW into ArcGIS Field Maps data forms. Incidental observations of special status fauna or invasive fauna were documented when encountered.

2.2 Data Collected

Special Status Wildlife Species

When a special status fauna species was detected, Hamer biologist recorded the following information:

1. Species name and number of individuals.
2. GPS location (with sub-meter level accuracy GPS)
    a. ESA-protected special status fauna were mapped as points, with approximate number of individuals added as a note. When a special status fauna species was observed the approximate distance and bearing to the individual or group was recorded and mapped from the observation point.
    b. MBTA and all other wildlife species were collected at the established observation locations.
3. Life stage (e.g., juvenile, adult) if possible to determine in the field.
4. Condition (e.g., dead, poor, fair, good) if possible to determine in the field.

Representative photos were taken to document federally listed species, or other items of note, when possible.

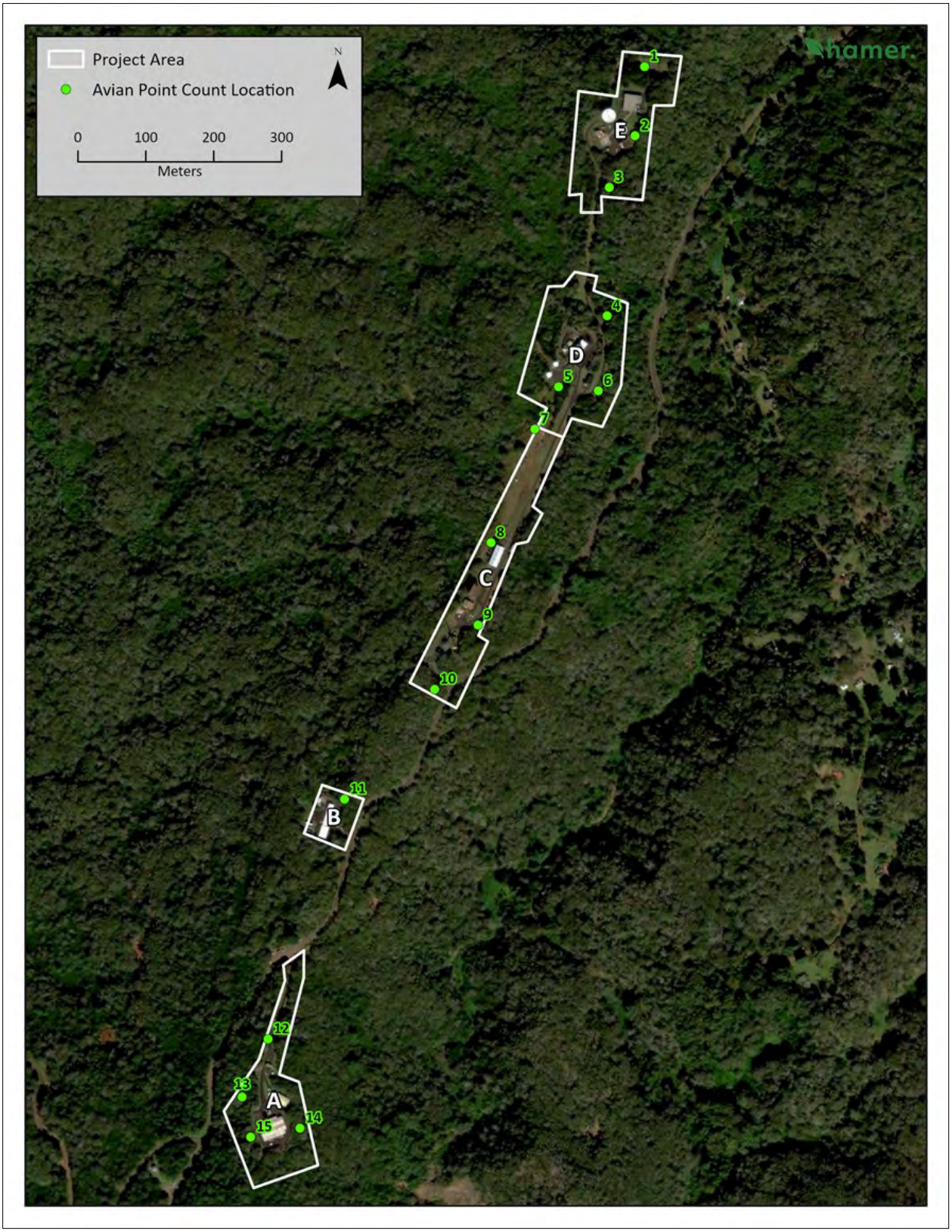

Figure 2-1. Fauna Observation Points (Avian Point Count Locations) within the KPGO Study Area, Kaua‘i, Hawai‘i.

Habitat Assessment

As stated in the SOW, plant community and land cover mapping of the survey area was conducted concurrent to the fauna and vegetation field surveys in Spring and Fall 2024. Habitat at each observation point was noted, and dominant plant species recorded, as were any other items of interest or high disturbance. Representative photos were taken to document habitats, or other items of note, when possible.

When identified within the KPGO study area, koa (*Acacia koa*), ʻohe (*Polyscias hawaiensis*) or lapalapa (*Cheirodendron* spp.) tree trunks were quickly scanned for scars/seeps/slime flux to attempt to visually observe sign of the federally endangered Hawaiian picture-wing fly (*Drosophila musaphilia, D. sharpi*) in suitable habitat. Surveys of trees were done during the spring fauna survey, with a revisit to a subsample of areas in the fall (winter and summer appear to be best seasons for observing the species, though they have been identified in spring) (USFWS 2008, 2022).

3. Survey Results

Results of the spring and fall 2024 terrestrial fauna surveys are detailed below. Results of surveys include all species documented at each of 15 observation points throughout the KPGO study area, number of individuals observed, condition, life stage, regulatory status, and GPS coordinates for the locations in a data matrix (Appendix A). Photos were collected at each of 15 fauna observation points of the KPGO study area, showing the habitats they covered (Appendix B). Finally, a complete list was compiled of all fauna species observed in the KPGO study area, noting their relative abundance (Appendix C).

3.1 Special Status Wildlife Species

Special status avians observed included two Federally threatened species:

- **Hawaiian Goose** (Nēnē, *Branta sandvicensis*), 2 adult birds were observed flying low over Site A (obs. pt. 13) on April 30, 2024 (Figure 3-1).
- **Hawaiian Goose**, 2 adult birds were heard calling while flying over Site C (obs. pt. 7) on October 15, 2024.
- **Scarlet Honeycreeper** (ʻIʻiwi, *Drepanis coccinea*) 1 adult bird seen in an ʻōhiʻa tree (*Metrosideros polymorpha*) in northern Site E (obs. pt. 1), and 1 bird heard only during the same survey visit (possibly the same individual) on May 1, 2024.
- **Scarlet Honeycreeper,** 1 adult bird, observed feeding on ʻōhiʻa flowers in a tree in northern Site E (obs. pt. 1) on May 13, 2024.
- **Scarlet Honeycreeper** 1 adult bird, seen in an ʻōhiʻa tree in northern Site A (obs. pt. 12) on April 30, 2024.

No waterbird habitat was observed within the KPGO study area. No federally protected seabirds like ʻAʻo (Newell's Shearwater, *Puffinus newelli*) were observed, as surveys were conducted during the morning and not when these nocturnal/crepuscular seabirds would be active. During the fall 2024 field survey, a seabird decoy was observed in two locations within KPGO study area, likely to ensure regular sweeps were made for downed nocturnal seabirds during the fall fledging period. Multiple avian carcasses were noted during the fall field surveys, which were part of a PMRF carcass removal study, where the carcasses were monitored daily for removal by predators (cats, dogs, and rats) (Figure 3-2). Together these efforts by PMRF are to ensure that any nocturnal seabirds that may fall out at PMRF facilities during the fall juvenile fledging season (between

September 15 and December 15), are immediately located and recovered by PMRF personnel. To reduce the likelihood of fallout for these federally protected seabirds during fall fledging, PMRF implemented and follows the Dark Skies Program annually, which requires outdoor lighting be reduced to only those lights needed for safety and mission requirements, and curtains and blinds be closed between the hours of 6:00 pm and 6:00 am HST (NAVFAC 2023).

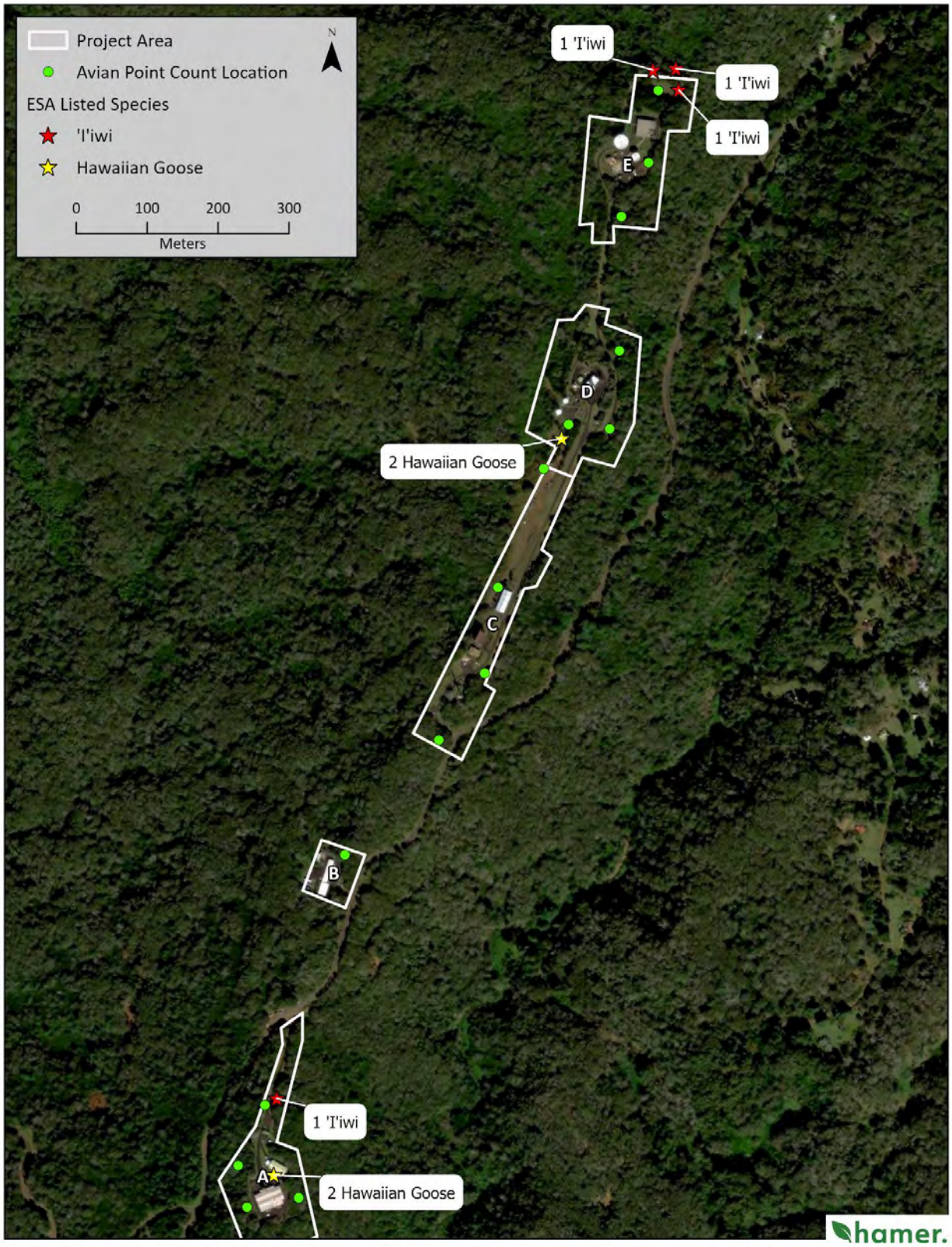

Figure 3-1. Federally Listed Birds in the KPGO Study Area, Kauaʻi, Hawaiʻi.

Figure 3-2. PMRF Carcass Removal Trial Avian Carcass, KPGO Study Area, Kaua‘i, Hawai‘i.

3.2 Migratory Bird Treaty Act Protected Species

MBTA protected species observed in the KPGO study area included: Pacific Golden Plover (Kōlea, *Pluvialis fulva,* 9 birds), White-tailed Tropicbird (*Phaethon lepturus*, 2 birds), and native forest birds Kaua‘i ‘Amakihi (‘Amakihi, *Chlorodrepanis stejnegeri*, 17 birds), ‘Anianiau (*Magumma parvus*, 17 birds), and ‘Apapane (*Himatione sanguinea*, 11 birds). Non-native MBTA birds observed included state invasive Western Cattle Egret (*Ardea ibis*, 7 birds), House Finch (*Haemorhous mexicanus*, 120 birds), Northern Mockingbird (*Mimus polyglottos*, 3 birds), and the most abundant migratory species, Northern Cardinal (*Cardinalis cardinalis*, 151 birds) (Table 3-1).

Table 3-1. Migratory Bird Treaty Act Species Observed in KPGO Study Area, Kaua‘i, Hawai‘i.

Common Name	Scientific Name	No. of Individuals (Spring Visits 1-3)	Life Stage/Notes: Spring	No. of Individuals (Fall Visits 4-6)	Life Stage/Notes: Fall	No. of Individuals (Total All Visits)
‘Anianiau	*Magumma parva*	6	Adults, observed in forested areas in Sites A, B, and C	11	Adults, observed in forested areas in Sites A, B, C, and E	17
‘Apapane	*Himatione sanguinea*	7	Adults and 1 Juvenile, observed in forested areas foraging and calling within Sites E, A, and C	4	Adults observed in forested areas foraging and calling within Sites E, A, and C	11
Western Cattle Egret	*Ardea ibis*	0	- n/a -	7	Adults observed flying over Kōke’e and foraging on ground in open areas within Sites C, A, and D	7
House Finch	*Haemorhous mexicanus*	78	Adults observed in all habitats of all Sites (A, B, C, D, E)	42	Adults observed in all habitats of all Sites (A, B, C, D, E)	120
Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	14	Adults observed in forested areas in Sites A, C, and E	3	Adults observed in forested areas in Sites A, C, D, and E	17
Northern Cardinal	*Cardinalis cardinalis*	94	Adults and juveniles observed in forested and edge of forest habitats of all Sites (A, B, C, D, E)	57	Adults observed in forested and edge of forest habitats of all Sites (A, B, C, D, E)	151
Northern Mockingbird	*Mimus polyglottos*	2	Adults observed in Sites C and E	1	Adult observed in forest edge of Site E	3

Common Name	Scientific Name	No. of Individuals (Spring Visits 1-3)	Life Stage/Notes: Spring	No. of Individuals (Fall Visits 4-6)	Life Stage/Notes: Fall	No. of Individuals (Total All Visits)
Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	1	Adult observed in Site A as audio detection, and later visually observed in developed area of Site A as incidental observation	8	Adults observed in Sites C, D, and E. Birds observed in Site C open grass area as breeding pair, and at other sites in open areas/grass lands	9
White-tailed Tropic Bird	*Phaethon lepturus*	1	Adult observed flying over Site A	1	Adult observed flying over Site D	2

3.3 Invasive Fauna

Evidence of invasive feral pigs (*Sus scrofa*), feral goats (*Capra hircus*), and Black-tailed deer (*Odocoileus hemionus hemionus*) were observed in the KPGO project area. Two dogs and a single Black-tailed deer were observed on site during the fall surveys (Appendix A). Invasive Western Cattle Egret (*Ardea ibis*) were observed in Sites A, C and D, and although an MBTA species, egrets are controlled at PMRF (through a 2017 USFWS depredation control order) to reduce the predation impacts to native bird eggs and nestlings (NAVFAC 2010). Multiple rat traps (Goodnature©) were observed along the periphery of the KPGO project area, and a single cat trap without bait was also noted (Figure 3-3). No incidental observations were made of KISC Priority Pest species, coqui frog (*Eleutherodactylus coqui*), little fire ant (*Wasmannia auropunctata*), coconut rhinoceros beetle (*Oryctes rhinoceros*), or mongoose (*Herpestes javanicus*).

Figure 3-3. Goodnature© rat trap, one of several observed at the boundary of the KPGO study area, Kauaʻi, Hawaiʻi.

3.4 Other Wildlife Species

Other birds detected during the fauna surveys included, most commonly, Warbling White-eye (Mejiro, *Zosterops japonicus*) with 746 individuals documented over the course of the six survey visits (Appendix D).

The next most commonly observed birds were Red Junglefowl (*Gallus gallus*) with 202 birds, and White-rumped Shama (*Copsychus malabaricus*) with 179 birds detected over the course of six survey visits.

Specialized surveys were not conducted in 2024 specifically for the picture-wing fly. However, koa, ʻohe, and lapalapa trees, the host plants for the fly, were inspected for evidence of injury resulting in seeps of tree sap, where the picture-wing flies lay their eggs. No signs of active tree sap seeps or picture-wing flies were observed in all areas of habitat inspected (Sites A, B, C, D and E) during spring fauna surveys. No evidence of Hawaiian Picture-wing fly (*Drosophila spp.*) individuals were observed during the 2024 fauna surveys,

3.5 Habitat Assessment

Suitability of potential fauna habitat in the KPGO study area was assessed and completed concurrent with the fauna observation surveys and vegetation surveys. All areas of the fauna survey area were visually assessed for fauna habitat suitability, dominant plants and presence of invasive plant species, except for an inaccessible part of western Site D (safety issue). Habitats within the majority of the KPGO study area fenceline were highly modified and contained roads, installation equipment and structures, as well as maintained meadow, lawn and landscaped areas. Habitat beyond the fenceline of each site was typically forest and scrub-shrub, with some areas of dense invasive species like strawberry guava in the understory. Native forest habitat was also present and described in the associated vegetation survey report (Hamer Environmental 2024).

The KPGO study area is relatively small in size, so the fauna observation points were often placed at the edge of two vegetation cover types in areas with best visibility to detect fauna. For this reason, the fauna habitats were best described by the vegetation cover types found in the KPGO study area. Photos were collected for each fauna observation point (Appendix B).

The fauna survey area was 19.2 ac, consisting of all lands not comprised of impervious surfaces (roads, buildings) (NOAA 2010). The survey area is 79% (15.1 ac) evergreen forest, 6% (1.2 ac) scrub-shrub land covers, and 15% (2.9 ac) developed open space (managed grasses like lawn or low-lying vegetation) (Table 3-2).

Table 3-2. Vegetation and Land Cover Types within the KPGO Study Area, Kauaʻi, Hawaiʻi.

Vegetation Type[1]	Nativity	Land Cover Type[2]
Non-native Grass-forb Meadow, Lawn	Non-native	Developed, Open Space (lawn, meadow)
Blackberry, Lantana Thicket	Non-native	Scrub/**Shrub**
Blackberry Thicket	Non-native	
Mixed Koa, Non-native Forest	Native, Non-native	Evergreen **Forest**

Vegetation Type[1]	Nativity	Land Cover Type[2]
Koa ʻŌhiʻa Mixed Montane Mesic Forest	Native	

[1]Vegetation Type (NAVFAC 2023).
[2]Land Cover Type (NOAA 2010).

3.6 Notable Habitat

Notable habitats within the KPGO study area included native koa-ʻōhiʻa mixed montane forest, with little encroachment by invasive species. Northern and eastern Site E and southern Site C contained the largest areas of this habitat, with smaller patches found in northern Site D, and small patches of Sites C and A. Most forest areas within the KPGO study area contained some amount of strawberry guava in the understory, which grows in monotypic stands that reduce overall species diversity.

Koa (Fusarium) Wilt

Koa trees observed within all KPGO study area sites showed evidence of partial dieback (sections of trees were completely defoliated and appeared dead, while other main branches appeared unaffected) as a result of a fungal infection known as Koa or Fusarium wilt (*Fusarium oxysporum*, Figure 3-4). Koa wilt has recently expanded on Kauaʻi and is visibly impacting koa trees along Waimea Canyon Road leading to the KPGO site, as well as within both Waimea Canyon and Kōke'e State Parks near the KPGO site.

Figure 3-4. Koa wilt (*Fusarium oxysporum*) is shown as dead lower branches on koa tree in Site C within the KPGO Study Area, Kaua‘i, Hawai‘i.

4. Discussion

4.1 Federally Protected Hawaiian Birds

Two species of Federally threatened birds were observed within the KPGO study area, the Hawaiian Goose (four individuals) and the ʻIʻiwi (four individuals). The Hawaiian Geese were observed both times as pairs flying over the KPGO study area, not utilizing any of the habitats within. One pair of geese was likely flying from the large grassy meadow by the lodge in nearby Kōkeʻe State Park based on trajectory and regular presence in the meadow. Three of the ʻIʻiwi detections, all individual birds, were made from Observation Point 1 in northern Site E, on land managed by NASA (Figure 2-1, Figure 3-1). This area of Site E contains an open maintained meadow, surrounded by native koa and ʻōhiʻa forest, and represented some of the best native intact forest habitat within the KPGO study area. Although high quality for the KPGO study area, invasive strawberry guava and Chinese privet were present in some parts of this forest, particularly at the edges.

4.2 Hawaiian Picture-wing Fly

No Hawaiian picture-wing fly species were observed during the 2024 fauna survey effort. Surveys were focused on the presence of habitat for picture-wing fly and not conducted by entomologist specialists during peak season (summer, winter) to observe and properly identify them. However, in 2022, an entomologist did detect Federally endangered picture-wing fly (*Drosophila musaphilia*) in Site E, at a Koa tree with an active seep during terrestrial invertebrate surveys (Magnacca 2022). Two Picture-wing flies were documented in 2010 by expert entomologists in close proximity to KPGO Site B (NAVFAC 2010). Critical habitat designated for this species is also in the vicinity but outside of the KPGO study area. In KPGO Site D, a small restoration planting of twelve native plants was installed in 2022 to benefit Hawaiian picture-wing fly habitat, and while still young, are establishing successfully (Appendix B).

4.3 Migratory Bird Treaty Act Protected Species

Nine species of MBTA-protected birds were observed in the KPGO study area, including native forest birds Kauaʻi ʻAmakihi, ʻAnianiau, and ʻApapane, observed in all sites but most abundantly in Sites C and E. Other native species, Kōlea (Pacific Golden Plover), and White-tailed Tropicbird were observed infrequently. The Kōlea were observed multiple times as a pair during the fall survey in the center of the meadow in Site C in the general area used by the State of Hawaiʻi for helicopter activities. White-tailed Tropicbirds were only observed twice, flying over Site A and Site D. Non-native MBTA species were common throughout the KPGO study area and birds like the Northern Cardinal were more abundant than the native MBTA species.

4.4 Invasive Species

Invasive fauna species or sign observed in the KPGO study area included Black-tailed deer, feral pig, dogs, and Western Cattle Egrets. Of those listed, feral pigs, dogs and egrets, are known to predate on native, ESA- and MBTA-protected birds. Feral pigs and other ungulates also degrade native habitats through disturbance, allowing introduction and spread of invasive plants. No KISC invasive species, such as coqui frog or little fire ant were observed during the fauna field surveys.

4.5 Survey Notes

The 2022 terrestrial invertebrate survey authors noted that Sites B and E contained suitable habitat with native host trees for the picture-wing fly, despite a sometimes dense understory of invasive strawberry guava (Magnacca 2022). However, the lack of young native host trees in these forests due to invasive plants, and to a lesser extent pigs, were noted as a threat to future survival of picture-wing fly species in the KPGO study area. This 2024 fauna study confirmed that the native koa tree habitat that the picture-wing flies require, is present in most forested areas, but additionally noted that more than half of the mature koa trees in the KPGO study area are infected with Fusarium wilt, a fungal pathogen (Figure 3-4).

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APPENDIX A. FAUNA SURVEYS DATA MATRIX

The following matrix incorporates all species observed during Spring 2024 field visits 1-3, with a combined count of individuals of the same species at each observation point, as well as mean number of individuals per visit. When an ESA-protected animal was detected, data was presented in the matrix for that individual detection, and not averaged. Location coordinates are reported in WGS84 Universal Transverse Mercator (UTM).

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
1	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431459.37	2447064.92	
1	Northern Cardinal	*Cardinalis cardinalis*	10	3.3	Good	Adults, Juveniles	-	Y	431459.37	2447064.92	
1	Kauaʻi Elepaio	*Chasiempis sclateri*	1	0.3	Good	Adult	-	N	431459.37	2447064.92	
1	Kauaʻi ʻAmakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	431459.37	2447064.92	
1	White-rumped Shama	*Copsychus malabaricus*	9	3.0	Good	Adults	-	N	431459.37	2447064.92	
1	Red Junglefowl	*Gallus gallus*	9	3.0	Good	Adults	-	N	431459.37	2447064.92	
1	House Finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	N	431459.37	2447064.92	
1	ʻApapane	*Himatione sanguinea*	3	1.0	Good	Adults	-	Y	431459.37	2447064.92	
1	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	4	1.3	Good	Adults	-	N	431459.37	2447064.92	
1	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	4	1.3	Good	Adults	-	N	431459.37	2447064.92	
1	Northern Mockingbird	*Mimus polyglottos*	1	0.3	Good	Adult	-	Y	431459.37	2447064.92	
1	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431459.37	2447064.92	
1	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431459.37	2447064.92	
1	Scarlet Honeycreeper (ʻIʻiwi)	*Drepanis coccinea*	1	-	Good	Adult	FT, SE	N	431488.23	2447065.84	5-1-2024, auditory detection
1	Scarlet Honeycreeper (ʻIʻiwi)	*Drepanis coccinea*	1	-	Good	Adult	FT, SE	N	431484.01	2447096.04	5-1-2024, both visual and auditory detection
1	Scarlet Honeycreeper (ʻIʻiwi)	*Drepanis coccinea*	1	-	Good	Adult	FT, SE	N	431451.78	2447093.96	5-13-2024, both visual and auditory detection
1	Warbling White-eye (Mejiro)	*Zosterops japonicus*	13	4.3	Good	Adults	-	N	431459.37	2447064.92	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
2	Northern Cardinal	*Cardinalis cardinalis*	6	2.0	Good	Adults	-	Y	431445.59	2446963.16	
2	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	431445.59	2446963.16	
2	White-rumped Shama	*Copsychus malabaricus*	3	1.0	Good	Adults	-	N	431445.59	2446963.16	
2	Erckel's Francolin	*Pternistis erckelii*	1	0.3	Good	Adult	-	N	431445.59	2446963.16	
2	Red Junglefowl	*Gallus gallus*	7	2.3	Good	Adults	-	N	431445.59	2446963.16	
2	House Finch	*Haemorhous mexicanus*	6	2.0	Good	Adults	-	N	431445.59	2446963.16	
2	‘Apapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	431445.59	2446963.16	
2	Red-crested Cardinal	*Paroaria coronata*	5	1.7	Good	Adults	-	N	431445.59	2446963.16	
2	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431445.59	2446963.16	
2	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431445.59	2446963.16	
2	Warbling White-eye (Mejiro)	*Zosterops japonicus*	8	2.7	Good	Adults	-	N	431445.59	2446963.16	
3	Northern Cardinal	*Cardinalis cardinalis*	6	2.0	Good	Adults	-	Y	431407.40	2446886.91	
3	Kaua‘i Elepaio	*Chasiempis sclateri*	5	1.7	Good	Adults	-	N	431407.40	2446886.91	
3	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	2	0.7	Good	Adults	-	Y	431407.40	2446886.91	
3	White-rumped Shama	*Copsychus malabaricus*	7	2.3	Good	Adults	-	N	431407.40	2446886.91	
3	Erckel's Francolin	*Pternistis erckelii*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	
3	Red Junglefowl	*Gallus gallus*	6	2.0	Good	Adults	-	N	431407.40	2446886.91	
3	House Finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	N	431407.40	2446886.91	
3	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	4	1.3	Good	Adults	-	N	431407.40	2446886.91	
3	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	
3	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	
3	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	431407.40	2446886.91	
3	Spotted Dove	*Spilopelia chinensis*	2	0.7	Good	Adults	-	N	431407.40	2446886.91	
3	Warbling White-eye (Mejiro)	*Zosterops japonicus*	18	6.0	Good	Adults	-	N	431407.40	2446886.91	
4	Common Myna	*Acridotheres tristis*	2	0.7	Good	Adults	-	N	431404.19	2446697.84	
4	Northern Cardinal	*Cardinalis cardinalis*	9	3.0	Good	Adults, Juveniles	-	Y	431404.19	2446697.84	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
4	Kauaʻi Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adult, Juvenile	-	N	431404.19	2446697.84	
4	White-rumped Shama	*Copsychus malabaricus*	10	3.3	Good	Adults	-	N	431404.19	2446697.84	
4	Erckel's Francolin	*Pternistis erckelii*	3	1.0	Good	Adults	-	N	431404.19	2446697.84	
4	Red Junglefowl	*Gallus gallus*	10	3.3	Good	Adults	-	N	431404.19	2446697.84	
4	House Finch	*Haemorhous mexicanus*	6	2.0	Good	Adults	-	N	431404.19	2446697.84	
4	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	8	2.7	Good	Adults	-	N	431404.19	2446697.84	
4	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431404.19	2446697.84	
4	Scaly-breasted Munia	*Lonchura punctulata*	1	0.3	Good	Adult	-	N	431404.19	2446697.84	
4	Red-crested Cardinal	*Paroaria coronata*	5	1.7	Good	Adults	-	N	431404.19	2446697.84	
4	Saffron Finch	*Sicalis flaveola*	2	0.7	Good	Adults	-	N	431404.19	2446697.84	
4	Spotted Dove	*Spilopelia chinensis*	2	0.7	Good	Adults	-	N	431404.19	2446697.84	
4	Warbling White-eye (Mejiro)	*Zosterops japonicus*	13	4.3	Good	Adults	-	N	431404.19	2446697.84	
5	Common Myna	*Acridotheres tristis*	3	1.0	Good	Adults	-	N	431332.83	2446593.50	
5	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	431332.83	2446593.50	
5	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431332.83	2446593.50	
5	Erckel's Francolin	*Pternistis erckelii*	3	1.0	Good	Adults	-	N	431332.83	2446593.50	
5	Red Junglefowl	*Gallus gallus*	8	2.7	Good	Adults	-	N	431332.83	2446593.50	
5	House Finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	N	431332.83	2446593.50	
5	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	5	1.7	Good	Adults	-	N	431332.83	2446593.50	
5	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	431332.83	2446593.50	
5	Saffron Finch	*Sicalis flaveola*	4	1.3	Good	Adults	-	N	431332.83	2446593.50	
5	Spotted Dove	*Spilopelia chinensis*	2	0.7	Good	Adults	-	N	431332.83	2446593.50	
5	Warbling White-eye (Mejiro)	*Zosterops japonicus*	12	4.0	Good	Adults	-	N	431332.83	2446593.50	
6	Common Myna	*Acridotheres tristis*	2	0.7	Good	Adults	-	N	431390.97	2446587.81	
6	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	431390.97	2446587.81	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
6	Kauaʻi Elepaio	*Chasiempis sclateri*	1	0.3	Good	Juvenile	-	N	431390.97	2446587.81	
6	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431390.97	2446587.81	
6	Erckel's Francolin	*Pternistis erckelii*	5	1.7	Good	Adults, Juveniles	-	N	431390.97	2446587.81	
6	Red Junglefowl	*Gallus gallus*	8	2.7	Good	Adults	-	N	431390.97	2446587.81	
6	House Finch	*Haemorhous mexicanus*	6	2.0	Good	Adults	-	N	431390.97	2446587.81	
6	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	6	2.0	Good	Adults	-	N	431390.97	2446587.81	
6	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	Scaly-breasted Munia	*Lonchura punctulata*	2	0.7	Good	Adults	-	N	431390.97	2446587.81	
6	Red-crested Cardinal	*Paroaria coronata*	4	1.3	Good	Adults	-	N	431390.97	2446587.81	
6	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	Warbling White-eye (Mejiro)	*Zosterops japonicus*	10	3.3	Good	Adults	-	N	431390.97	2446587.81	
7	Common Myna	*Acridotheres tristis*	3	1.0	Good	Adults	-	N	431297.90	2446531.57	
7	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	431297.90	2446531.57	
7	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431297.90	2446531.57	
7	Erckel's Francolin	*Pternistis erckelii*	3	1.0	Good	Adults, Juveniles	-	N	431297.90	2446531.57	
7	Red Junglefowl	*Gallus gallus*	7	2.3	Good	Adults	-	N	431297.90	2446531.57	
7	House Finch	*Haemorhous mexicanus*	10	3.3	Good	Adults	-	N	431297.90	2446531.57	
7	ʻApapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	431297.90	2446531.57	
7	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	5	1.7	Good	Adults	-	N	431297.90	2446531.57	
7	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	431297.90	2446531.57	
7	Scaly-breasted Munia	*Lonchura punctulata*	5	1.7	Good	Adults	-	N	431297.90	2446531.57	
7	Red-crested Cardinal	*Paroaria coronata*	2	0.7	Good	Adults	-	N	431297.90	2446531.57	
7	Saffron Finch	*Sicalis flaveola*	4	1.3	Good	Adults	-	N	431297.90	2446531.57	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
7	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431297.90	2446531.57	
7	Warbling White-eye (Mejiro)	*Zosterops japonicus*	16	5.3	Good	Adults	-	N	431297.90	2446531.57	
8	Common Myna	*Acridotheres tristis*	2	0.7	Good	Adults	-	N	431233.10	2446364.05	
8	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	431233.10	2446364.05	
8	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431233.10	2446364.05	
8	Erckel's Francolin	*Pternistis erckelii*	3	1.0	Good	Adults, Juveniles	-	N	431233.10	2446364.05	
8	Red Junglefowl	*Gallus gallus*	12	4.0	Good	Adults	-	N	431233.10	2446364.05	
8	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	House Finch	*Haemorhous mexicanus*	5	1.7	Good	Adults	-	N	431233.10	2446364.05	
8	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	8	2.7	Good	Adults	-	N	431233.10	2446364.05	
8	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Scaly-breasted Munia	*Lonchura punctulata*	3	1.0	Good	Adults	-	N	431233.10	2446364.05	
8	Northern Mockingbird	*Mimus polyglottos*	1	0.3	Good	Adult	-	Y	431233.10	2446364.05	
8	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	431233.10	2446364.05	
8	Warbling White-eye (Mejiro)	*Zosterops japonicus*	15	5.0	Good	Adults	-	N	431233.10	2446364.05	
9	Common Myna	*Acridotheres tristis*	6	2.0	Good	Adults	-	N	431214.39	2446242.95	
9	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	431214.39	2446242.95	
9	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	2	0.7	Good	Adults	-	Y	431214.39	2446242.95	
9	White-rumped Shama	*Copsychus malabaricus*	9	3.0	Good	Adults	-	N	431214.39	2446242.95	
9	Erckel's Francolin	*Pternistis erckelii*	1	0.3	Good	Adult	-	N	431214.39	2446242.95	
9	Red Junglefowl	*Gallus gallus*	13	4.3	Good	Adults	-	N	431214.39	2446242.95	
9	House Finch	*Haemorhous mexicanus*	6	2.0	Good	Adults	-	N	431214.39	2446242.95	
9	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	11	3.7	Good	Adults	-	N	431214.39	2446242.95	
9	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431214.39	2446242.95	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
9	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431214.39	2446242.95	
9	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431214.39	2446242.95	
9	Warbling White-eye (Mejiro)	*Zosterops japonicus*	15	5.0	Good	Adults	-	N	431214.39	2446242.95	
10	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	431150.18	2446148.52	
10	Northern Cardinal	*Cardinalis cardinalis*	8	2.7	Good	Adults	-	Y	431150.18	2446148.52	
10	Kaua‘i Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adults	-	N	431150.18	2446148.52	
10	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	3	1.0	Good	Adults	-	Y	431150.18	2446148.52	
10	White-rumped Shama	*Copsychus malabaricus*	10	3.3	Good	Adults, Juvenile	-	N	431150.18	2446148.52	
10	Red Junglefowl	*Gallus gallus*	8	2.7	Good	Adults	-	N	431150.18	2446148.52	
10	House Finch	*Haemorhous mexicanus*	3	1.0	Good	Adults	-	N	431150.18	2446148.52	
10	‘Apapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	431150.18	2446148.52	
10	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	3	1.0	Good	Adults	-	N	431150.18	2446148.52	
10	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	431150.18	2446148.52	
10	Scaly-breasted Munia	*Lonchura punctulata*	1	0.3	Good	Adult	-	N	431150.18	2446148.52	
10	‘Anianiau	*Magumma parva*	2	0.7	Good	Adults	-	Y	431150.18	2446148.52	
10	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431150.18	2446148.52	
10	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431150.18	2446148.52	
10	Warbling White-eye (Mejiro)	*Zosterops japonicus*	16	5.3	Good	Adults	-	N	431150.18	2446148.52	
11	Common Myna	*Acridotheres tristis*	2	0.7	Good	Adults	-	N	431017.59	2445986.71	
11	Red Avadavat	*Amandava amandava*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	Northern Cardinal	*Cardinalis cardinalis*	6	2.0	Good	Adults	-	Y	431017.59	2445986.71	
11	White-rumped Shama	*Copsychus malabaricus*	3	1.0	Good	Adults	-	N	431017.59	2445986.71	
11	Red Junglefowl	*Gallus gallus*	4	1.3	Good	Adults	-	N	431017.59	2445986.71	
11	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	House Finch	*Haemorhous mexicanus*	3	1.0	Good	Adults	-	N	431017.59	2445986.71	
11	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	6	2.0	Good	Adults	-	N	431017.59	2445986.71	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
11	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	ʻAnianiau	*Magumma parva*	2	0.7	Good	Adults	-	Y	431017.59	2445986.71	
11	Red-crested Cardinal	*Paroaria coronata*	5	1.7	Good	Adults	-	N	431017.59	2445986.71	
11	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	431017.59	2445986.71	
11	Warbling White-eye (Mejiro)	*Zosterops japonicus*	12	4.0	Good	Adults	-	N	431017.59	2445986.71	
12	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	430904.79	2445633.75	
12	Northern Cardinal	*Cardinalis cardinalis*	8	2.7	Good	Adults, Juveniles	-	Y	430904.79	2445633.75	
12	Kauaʻi ʻAmakihi	*Chlorodrepanis stejnegeri*	2	0.7	Good	Adults	-	Y	430904.79	2445633.75	
12	White-rumped Shama	*Copsychus malabaricus*	4	1.3	Good	Adults	-	N	430904.79	2445633.75	
12	Gray Francolin	*Francolinus pondicerianus*	1	0.3	Good	Adult	-	N	430904.79	2445633.75	
12	Red Junglefowl	*Gallus gallus*	5	1.7	Good	Adults	-	N	430904.79	2445633.75	
12	House Finch	*Haemorhous mexicanus*	5	1.7	Good	Adults	-	N	430904.79	2445633.75	
12	ʻApapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	430904.79	2445633.75	
12	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	7	2.3	Good	Adults	-	N	430904.79	2445633.75	
12	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	2	0.7	Good	Adults	-	N	430904.79	2445633.75	
12	Scaly-breasted Munia	*Lonchura punctulata*	2	0.7	Good	Adults	-	N	430904.79	2445633.75	
12	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430904.79	2445633.75	
12	White-tailed tropic bird	*Phaethon lepturus*	1	0.3	Good	Adult	-	Y	430904.79	2445633.75	
12	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	430904.79	2445633.75	
12	Scarlet Honeycreeper (ʻIʻiwi)	*Drepanis coccinea*	1	-	Good	Adult	FT, SE	N	430921.48	2445642.97	seen in an ohia tree to northeast
12	Warbling White-eye (Mejiro)	*Zosterops japonicus*	21	7.0	Good	Adults	-	N	430904.79	2445633.75	
13	Common Myna	*Acridotheres tristis*	10	3.3	Good	Adults	-	N	430866.75	2445548.38	
13	Red Avadavat	*Amandava amandava*	2	0.7	Good	Adults	-	N	430866.75	2445548.38	
13	Hawaiian Goose	*Branta sandvicensis*	1	-	Good	Adult	FT, SE	Y	430917.25	2445534.76	seen and heard flying over site A
13	Northern Cardinal	*Cardinalis cardinalis*	6	2.0	Good	Adults	-	Y	430866.75	2445548.38	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
13	Kauaʻi ʻAmakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	430866.75	2445548.38	
13	White-rumped Shama	*Copsychus malabaricus*	3	1.0	Good	Adults	-	N	430866.75	2445548.38	
13	Erckel's Francolin	*Pternistis erckelii*	2	0.7	Good	Adults	-	N	430866.75	2445548.38	
13	Red Junglefowl	*Gallus gallus*	2	0.7	Good	Adults	-	N	430866.75	2445548.38	
13	House Finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	N	430866.75	2445548.38	
13	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	13	4.3	Good	Adults	-	N	430866.75	2445548.38	
13	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	430866.75	2445548.38	
13	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430866.75	2445548.38	
13	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	430866.75	2445548.38	
13	Spotted Dove	*Spilopelia chinensis*	3	1.0	Good	Adults	-	N	430866.75	2445548.38	
13	Warbling White-eye (Mejiro)	*Zosterops japonicus*	15	5.0	Good	Adults	-	N	430866.75	2445548.38	
14	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	430952.13	2445502.52	
14	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	430952.13	2445502.52	
14	Kauaʻi Elepaio	*Chasiempis sclateri*	1	0.3	Good	Adult	-	N	430952.13	2445502.52	
14	White-rumped Shama	*Copsychus malabaricus*	8	2.7	Good	Adults	-	N	430952.13	2445502.52	
14	Erckel's Francolin	*Pternistis erckelii*	3	1.0	Good	Adults	-	N	430952.13	2445502.52	
14	Red Junglefowl	*Gallus gallus*	4	1.3	Good	Adults	-	N	430952.13	2445502.52	
14	House Finch	*Haemorhous mexicanus*	6	2.0	Good	Adults	-	N	430952.13	2445502.52	
14	ʻApapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	430952.13	2445502.52	
14	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	10	3.3	Good	Adults	-	N	430952.13	2445502.52	
14	ʻAnianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	430952.13	2445502.52	
14	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430952.13	2445502.52	
14	Pacific Golden-Plover (Kōlea)	*Pluvialis fulva*	1	0.3	Good	Adult	-	Y	430952.13	2445502.52	
14	Saffron Finch	*Sicalis flaveola*	4	1.3	Good	Adults	-	N	430952.13	2445502.52	
14	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	430952.13	2445502.52	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V1-3)[1]	Mean No. per Visit (V1-3)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
14	Warbling White-eye (Mejiro)	*Zosterops japonicus*	14	4.7	Good	Adults	-	N	430952.13	2445502.52	
15	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	Northern Cardinal	*Cardinalis cardinalis*	2	0.7	Good	Adults	-	Y	430879.42	2445489.42	
15	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	430879.42	2445489.42	
15	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	430879.42	2445489.42	
15	Erckel's Francolin	*Pternistis erckelii*	2	0.7	Good	Adults	-	N	430879.42	2445489.42	
15	Red Junglefowl	*Gallus gallus*	2	0.7	Good	Adults	-	N	430879.42	2445489.42	
15	House Finch	*Haemorhous mexicanus*	3	1.0	Good	Adults	-	N	430879.42	2445489.42	
15	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	10	3.3	Good	Adults	-	N	430879.42	2445489.42	
15	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	430879.42	2445489.42	
15	Scaly-breasted Munia	*Lonchura punctulata*	1	0.3	Good	Adult	-	N	430879.42	2445489.42	
15	‘Anianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	430879.42	2445489.42	
15	Red-crested Cardinal	*Paroaria coronata*	2	0.7	Good	Adults	-	N	430879.42	2445489.42	
15	Saffron Finch	*Sicalis flaveola*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	Warbling White-eye (Mejiro)	*Zosterops japonicus*	14	4.7	Good	Adults	-	N	430879.42	2445489.42	

[1]Number of observations (V1-3) = Total number of individual birds of this species observed over the course of 3 visits. Note, any ESA-listed birds detected were noted as their individual detection, and not summed across multiple visits.

[2]Mean Number of observations (V1-3) = Average number of individual birds of this species observed per visit.

[3]Regulatory Status = Federal Endangered (FE), Federal Threatened (FT), State of Hawaii Endangered (SE), State of Hawaii Threatened (ST).

The following matrix incorporates all species observed during Fall 2024 field visits 4-6, with a combined count of individuals of the same species at each observation point, as well as mean number of individuals per visit. When an ESA-protected animal was detected, data was presented in the matrix for that individual detection, and not averaged. Location coordinates are reported in WGS84 UTM.

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
1	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	431459.37	2447064.92	
1	White-rumped Shama	*Copsychus malabaricus*	7	2.3	Good	Adults	-	N	431459.37	2447064.92	
1	Red Junglefowl	*Gallus gallus*	7	2.3	Good	Adults	-	N	431459.37	2447064.92	
1	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431459.37	2447064.92	
1	House finch	*Haemorhous mexicanus*	7	2.3	Good	Adults	-	Y	431459.37	2447064.92	
1	‘Apapane	*Himatione sanguinea*	2	0.7	Good	Adults	-	Y	431459.37	2447064.92	
1	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	1	0.3	Good	unk	-	N	431459.37	2447064.92	
1	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	4	1.3	Good	Adults	-	N	431459.37	2447064.92	
1	Red-crested Cardinal	*Paroaria coronata*	2	0.7	Good	Adults	-	N	431459.37	2447064.92	
1	Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	2	0.7	Good	Adults	-	Y	431459.37	2447064.92	
1	Spotted Dove	*Spilopelia chinensis*	3	1.0	Good	Adults	-	N	431459.37	2447064.92	
1	Warbling White-eye (Mejiro)	*Zosterops japonicus*	23	7.7	Good	Adults	-	N	431459.37	2447064.92	
2	Northern Cardinal	*Cardinalis cardinalis*	1	0.3	Good	Adult	-	Y	431445.59	2446963.16	
2	Red Junglefowl	*Gallus gallus*	2	0.7	Good	Adults	-	N	431445.59	2446963.16	
2	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431445.59	2446963.16	
2	House finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	Y	431445.59	2446963.16	
2	Red-crested Cardinal	*Paroaria coronata*	4	1.3	Good	Adults	-	N	431445.59	2446963.16	
2	Saffron Finch	*Sicalis flaveola*	2	0.7	Good	Adults	-	N	431445.59	2446963.16	
2	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431445.59	2446963.16	
2	Warbling White-eye (Mejiro)	*Zosterops japonicus*	24	8.0	Good	Adults	-	N	431445.59	2446963.16	
3	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
3	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	431407.40	2446886.91	
3	Kauaʻi Elepaio	*Chasiempis sclateri*	3	1.0	Good	Adults	-	N	431407.40	2446886.91	
3	Kauaʻi ʻAmakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	431407.40	2446886.91	
3	White-rumped Shama	*Copsychus malabaricus*	3	1.0	Good	Adults	-	N	431407.40	2446886.91	
3	Erckel's Francolin	*Pternistis erckelii*	2	0.7	Good	Adults	-	N	431407.40	2446886.91	
3	Red Junglefowl	*Gallus gallus*	6	2.0	Good	Adults	-	N	431407.40	2446886.91	
3	Zebra Dove	*Geopelia striata*	2	0.7	Good	Adults	-	N	431407.40	2446886.91	
3	House finch	*Haemorhous mexicanus*	3	1.0	Good	Adults	-	Y	431407.40	2446886.91	
3	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	4	1.3	Good	Adults	-	N	431407.40	2446886.91	
3	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	431407.40	2446886.91	
3	ʻAnianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	431407.40	2446886.91	
3	Red-crested Cardinal	*Paroaria coronata*	5	1.7	Good	Adults	-	N	431407.40	2446886.91	
3	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	
3	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431407.40	2446886.91	
3	Warbling White-eye (Mejiro)	*Zosterops japonicus*	22	7.3	Good	Adults	-	N	431407.40	2446886.91	
inciden tal	Domestic dog	*Canus lupus domesticus*	2	0.7	Good	Adults	-	N	431404.19	2446697.84	2 hunting dogs, pets observed in north Site D, 10/21/2024
4	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	431404.19	2446697.84	
4	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	431404.19	2446697.84	
4	Kauaʻi ʻAmakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	431404.19	2446697.84	
4	White-rumped Shama	*Copsychus malabaricus*	9	3.0	Good	Adults	-	N	431404.19	2446697.84	
4	Erckel's Francolin	*Pternistis erckelii*	1	0.3	Good	Adult	-	N	431404.19	2446697.84	
4	Red Junglefowl	*Gallus gallus*	7	2.3	Good	Adults	-	N	431404.19	2446697.84	
4	House finch	*Haemorhous mexicanus*	1	0.3	Good	Adult	-	Y	431404.19	2446697.84	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
4	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	1	0.3	Good	unk	-	N	431404.19	2446697.84	
4	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431404.19	2446697.84	
4	Red-crested Cardinal	*Paroaria coronata*	6	2.0	Good	Adults	-	N	431404.19	2446697.84	
4	House Sparrow	*Passer domesticus*	1	0.3	Good	Adult	-	N	431404.19	2446697.84	
4	White-tailed tropic bird	*Phaethon lepturus*	1	0.3	Good	Adult	-	Y	431404.19	2446697.84	
4	Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	1	0.3	Good	Adult	-	Y	431404.19	2446697.84	
4	Spotted Dove	*Spilopelia chinensis*	6	2.0	Good	Adults	-	N	431404.19	2446697.84	
4	Warbling White-eye (Mejiro)	*Zosterops japonicus*	21	7.0	Good	Adults	-	N	431404.19	2446697.84	
5	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431332.83	2446593.50	
5	Northern Cardinal	*Cardinalis cardinalis*	2	0.7	Good	Adult, Juvenile	-	Y	431332.83	2446593.50	
5	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431332.83	2446593.50	
5	Red Junglefowl	*Gallus gallus*	8	2.7	Good	Adults	-	N	431332.83	2446593.50	
5	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	5	1.7	Good	unk	-	N	431332.83	2446593.50	
5	Scaly-breasted Munia	*Lonchura punctulata*	3	1.0	Good	Adults	-	N	431332.83	2446593.50	
5	Red-crested Cardinal	*Paroaria coronata*	3	1.0	Good	Adults	-	N	431332.83	2446593.50	
5	Saffron Finch	*Sicalis flaveola*	2	0.7	Good	Adults	-	N	431332.83	2446593.50	
5	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431332.83	2446593.50	
5	Warbling White-eye (Mejiro)	*Zosterops japonicus*	25	8.3	Good	Adults	-	N	431332.83	2446593.50	
6	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	431390.97	2446587.81	
6	Cattle Egret	*Bubulcus ibis*	1	0.3	Good	Adult	-	Y	431390.97	2446587.81	
6	Northern Cardinal	*Cardinalis cardinalis*	2	0.7	Good	Adults	-	Y	431390.97	2446587.81	
6	White-rumped Shama	*Copsychus malabaricus*	8	2.7	Good	Adults	-	N	431390.97	2446587.81	
6	Red Junglefowl	*Gallus gallus*	6	2.0	Good	Adults	-	N	431390.97	2446587.81	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
6	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	House finch	*Haemorhous mexicanus*	1	0.3	Good	Adult	-	Y	431390.97	2446587.81	
6	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	6	2.0	Good	Adults	-	N	431390.97	2446587.81	
6	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	Chestnut Munia	*Lonchura atricapilla*	2	0.7	Good	Adults	-	N	431390.97	2446587.81	
6	Scaly-breasted Munia	*Lonchura punctulata*	3	1.0	Good	Adults	-	N	431390.97	2446587.81	
6	Red-crested Cardinal	*Paroaria coronata*	4	1.3	Good	Adults	-	N	431390.97	2446587.81	
6	Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	2	0.7	Good	Adults	-	Y	431390.97	2446587.81	
6	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431390.97	2446587.81	
6	Warbling White-eye (Mejiro)	*Zosterops japonicus*	18	6.0	Good	Adults	-	N	431390.97	2446587.81	
Inciden tal	Black-tailed Deer	*Odocoileus hemionus*	1	-	Good	Adult	-	N	431371.29	2446585.99	Seen walking through open area of Site D 10-16-2024
7	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431297.90	2446531.57	
7	Hawaiian Goose	*Branta sandvicensis*	1	0.3	unk	Adult	FT, SE	Y	431323.07	2446574.17	auditory detection of 2 birds calling
7	Northern Cardinal	*Cardinalis cardinalis*	5	1.7	Good	Adults	-	Y	431297.90	2446531.57	
7	White-rumped Shama	*Copsychus malabaricus*	5	1.7	Good	Adults	-	N	431297.90	2446531.57	
7	Red Junglefowl	*Gallus gallus*	5	1.7	Good	Adults	-	N	431297.90	2446531.57	
7	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	431297.90	2446531.57	
7	House finch	*Haemorhous mexicanus*	1	0.3	Good	Adult	-	Y	431297.90	2446531.57	
7	ʻApapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	431297.90	2446531.57	
7	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	5	1.7	Good	Adults	-	N	431297.90	2446531.57	
7	ʻAnianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	431297.90	2446531.57	
7	Red-crested Cardinal	*Paroaria coronata*	3	1.0	Good	Adults	-	N	431297.90	2446531.57	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
7	Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	1	0.3	Good	Adult	-	Y	431297.90	2446531.57	
7	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431297.90	2446531.57	
7	Warbling White-eye (Mejiro)	*Zosterops japonicus*	29	9.7	Good	Adults	-	N	431297.90	2446531.57	
8	Cattle Egret	*Bubulcus ibis*	1	0.3	Good	Adult	-	Y	431233.10	2446364.05	
8	Northern Cardinal	*Cardinalis cardinalis*	3	1.0	Good	Adults	-	Y	431233.10	2446364.05	
8	Kauaʻi Elepaio	*Chasiempis sclateri*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	White-rumped Shama	*Copsychus malabaricus*	2	0.7	Good	Adults	-	N	431233.10	2446364.05	
8	Red Junglefowl	*Gallus gallus*	4	1.3	Good	Adults	-	N	431233.10	2446364.05	
8	House finch	*Haemorhous mexicanus*	1	0.3	Good	Adult	-	Y	431233.10	2446364.05	
8	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	4	1.3	Good	unk	-	N	431233.10	2446364.05	
8	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	3	1.0	Good	Adults	-	N	431233.10	2446364.05	
8	Scaly-breasted Munia	*Lonchura punctulata*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Northern Mockingbird	*Mimus polyglottos*	1	0.3	Good	Adult	-	Y	431233.10	2446364.05	
8	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	1	0.3	Good	Adult	-	Y	431233.10	2446364.05	
8	Saffron Finch	*Sicalis flaveola*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431233.10	2446364.05	
8	Warbling White-eye (Mejiro)	*Zosterops japonicus*	25	8.3	Good	Adults	-	N	431233.10	2446364.05	
9	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	431214.39	2446242.95	
9	Cattle Egret	*Bubulcus ibis*	2	0.7	Good	Adults	-	Y	431214.39	2446242.95	
9	Northern Cardinal	*Cardinalis cardinalis*	3	1.0	Good	Adults	-	Y	431214.39	2446242.95	
9	Kauaʻi Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adults	-	N	431214.39	2446242.95	
9	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	431214.39	2446242.95	
9	Red Junglefowl	*Gallus gallus*	9	3.0	Good	Adults	-	N	431214.39	2446242.95	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
9	House finch	*Haemorhous mexicanus*	2	0.7	Good	Adults	-	Y	431214.39	2446242.95	
9	Melodious Laughingthrush (Hwamei)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	431214.39	2446242.95	
9	Red-crested Cardinal	*Paroaria coronata*	3	1.0	Good	Adults	-	N	431214.39	2446242.95	
9	Warbling White-eye (Mejiro)	*Zosterops japonicus*	20	6.7	Good	Adults	-	N	431214.39	2446242.95	
10	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431150.18	2446148.52	
10	Northern Cardinal	*Cardinalis cardinalis*	3	1.0	Good	Adults	-	Y	431150.18	2446148.52	
10	Kauaʻi Elepaio	*Chasiempis sclateri*	1	0.3	Good	Adult	-	N	431150.18	2446148.52	
10	White-rumped Shama	*Copsychus malabaricus*	3	1.0	Good	Adults	-	N	431150.18	2446148.52	
10	Red Junglefowl	*Gallus gallus*	6	2.0	Good	Adults	-	N	431150.18	2446148.52	
10	House finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	Y	431150.18	2446148.52	
10	ʻAnianiau	*Magumma parva*	4	1.3	Good	Adults	-	Y	431150.18	2446148.52	
10	Red-crested Cardinal	*Paroaria coronata*	2	0.7	Good	Adults	-	N	431150.18	2446148.52	
10	Saffron Finch	*Sicalis flaveola*	2	0.7	Good	Adults	-	N	431150.18	2446148.52	
10	Spotted Dove	*Spilopelia chinensis*	4	1.3	Good	Adults	-	N	431150.18	2446148.52	
10	Warbling White-eye (Mejiro)	*Zosterops japonicus*	21	7.0	Good	Adults	-	N	431150.18	2446148.52	
11	Common Myna	*Acridotheres tristis*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	Northern Cardinal	*Cardinalis cardinalis*	3	1.0	Good	Adults	-	Y	431017.59	2445986.71	
11	Kauaʻi Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adults	-	N	431017.59	2445986.71	
11	White-rumped Shama	*Copsychus malabaricus*	7	2.3	Good	Adults	-	N	431017.59	2445986.71	
11	Erckel's Francolin	*Pternistis erckelii*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	Red Junglefowl	*Gallus gallus*	8	2.7	Good	Adults	-	N	431017.59	2445986.71	
11	House finch	*Haemorhous mexicanus*	2	0.7	Good	Adults	-	Y	431017.59	2445986.71	
11	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	2	0.7	Good	Adults	-	N	431017.59	2445986.71	
11	ʻAnianiau	*Magumma parva*	3	1.0	Good	Adults	-	Y	431017.59	2445986.71	
11	Red-crested Cardinal	*Paroaria coronata*	3	1.0	Good	Adults	-	N	431017.59	2445986.71	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
11	House Sparrow	*Passer domesticus*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	Saffron Finch	*Sicalis flaveola*	3	1.0	Good	Adults	-	N	431017.59	2445986.71	
11	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	431017.59	2445986.71	
11	Warbling White-eye (Mejiro)	*Zosterops japonicus*	11	3.7	Good	Adults	-	N	431017.59	2445986.71	
12	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	430904.79	2445633.75	
12	Cattle Egret	*Bubulcus ibis*	1	0.3	Good	Adult	-	Y	430904.79	2445633.75	
12	Northern Cardinal	*Cardinalis cardinalis*	7	2.3	Good	Adults	-	Y	430904.79	2445633.75	
12	Kaua‘i Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adults	-	N	430904.79	2445633.75	
12	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	430904.79	2445633.75	
12	Red Junglefowl	*Gallus gallus*	3	1.0	Good	Adults	-	N	430904.79	2445633.75	
12	‘Apapane	*Himatione sanguinea*	1	0.3	Good	Adult	-	Y	430904.79	2445633.75	
12	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	1	0.3	Good	unk	-	N	430904.79	2445633.75	
12	‘Anianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	430904.79	2445633.75	
12	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430904.79	2445633.75	
12	Spotted Dove	*Spilopelia chinensis*	2	0.7	Good	Adults	-	N	430904.79	2445633.75	
12	Warbling White-eye (Mejiro)	*Zosterops japonicus*	19	6.3	Good	Adults	-	N	430904.79	2445633.75	
13	Common Myna	*Acridotheres tristis*	5	1.7	Good	Adults	-	N	430866.75	2445548.38	
13	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	430866.75	2445548.38	
13	Kaua‘i Elepaio	*Chasiempis sclateri*	1	0.3	Good	Adult	-	N	430866.75	2445548.38	
13	White-rumped Shama	*Copsychus malabaricus*	6	2.0	Good	Adults	-	N	430866.75	2445548.38	
13	Red Junglefowl	*Gallus gallus*	5	1.7	Good	Adults	-	N	430866.75	2445548.38	
13	House finch	*Haemorhous mexicanus*	3	1.0	Good	Adults	-	Y	430866.75	2445548.38	
13	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	2	0.7	Good	Adults	-	N	430866.75	2445548.38	
13	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	1	0.3	Good	Adult	-	N	430866.75	2445548.38	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
13	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430866.75	2445548.38	
13	Warbling White-eye (Mejiro)	*Zosterops japonicus*	16	5.3	Good	Adults	-	N	430866.75	2445548.38	
14	Common Myna	*Acridotheres tristis*	2	0.7	Good	Adults	-	N	430952.13	2445502.52	
14	Cattle Egret	*Bubulcus ibis*	1	0.3	Good	Adult	-	Y	430952.13	2445502.52	
14	Northern Cardinal	*Cardinalis cardinalis*	2	0.7	Good	Adults	-	Y	430952.13	2445502.52	
14	Kaua‘i Elepaio	*Chasiempis sclateri*	2	0.7	Good	Adults	-	N	430952.13	2445502.52	
14	Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	1	0.3	Good	Adult	-	Y	430952.13	2445502.52	
14	White-rumped Shama	*Copsychus malabaricus*	7	2.3	Good	Adults	-	N	430952.13	2445502.52	
14	Red Junglefowl	*Gallus gallus*	5	1.7	Good	Adults	-	N	430952.13	2445502.52	
14	Zebra Dove	*Geopelia striata*	1	0.3	Good	Adult	-	N	430952.13	2445502.52	
14	House finch	*Haemorhous mexicanus*	4	1.3	Good	Adults	-	Y	430952.13	2445502.52	
14	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	2	0.7	Good	unk	-	N	430952.13	2445502.52	
14	Red-crested Cardinal	*Paroaria coronata*	2	0.7	Good	Adults	-	N	430952.13	2445502.52	
14	Warbling White-eye (Mejiro)	*Zosterops japonicus*	18	6.0	Good	Adults	-	N	430952.13	2445502.52	
15	Common Myna	*Acridotheres tristis*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	Northern Cardinal	*Cardinalis cardinalis*	4	1.3	Good	Adults	-	Y	430879.42	2445489.42	
15	White-rumped Shama	*Copsychus malabaricus*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	Red Junglefowl	*Gallus gallus*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	House finch	*Haemorhous mexicanus*	2	0.7	Good	Adults	-	Y	430879.42	2445489.42	
15	Japanese Bush Warbler (Uguisu)	*Horornis diphone*	1	0.3	Good	unk	-	N	430879.42	2445489.42	
15	Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	4	1.3	Good	Adults	-	N	430879.42	2445489.42	
15	‘Anianiau	*Magumma parva*	1	0.3	Good	Adult	-	Y	430879.42	2445489.42	
15	Red-crested Cardinal	*Paroaria coronata*	1	0.3	Good	Adult	-	N	430879.42	2445489.42	
15	House Sparrow	*Passer domesticus*	1	0.3	Good	Adult	-	N	430879.42	2445489.42	

Obs. Station No.	Common Name	Scientific Name	No. of Obser-vations (V4-6)[1]	Mean No. per Visit (V4-6)[2]	Health Condi-tion	Life Stage	Reg. Status[3]	MBTA Spp. (Y/N)	Location UTM (X)	Location UTM (Y)	Notes
15	Spotted Dove	*Spilopelia chinensis*	1	0.3	Good	Adult	-	N	430879.42	2445489.42	
15	Warbling White-eye (Mejiro)	*Zosterops japonicus*	22	7.3	Good	Adults	-	N	430879.42	2445489.42	

[1]Number of observations (V4-6) = Total number of individual birds of this species observed over the course of 3 visits. Note, any ESA-listed birds detected were noted as their individual detection, and not summed across multiple visits.

[2]Mean Number of observations (V4-6) = Average number of individual birds of this species observed per visit.

[3]Regulatory Status = Federal Endangered (FE), Federal Threatened (FT), State of Hawai‘i Endangered (SE), State of Hawai‘i Threatened (ST).

APPENDIX B. FAUNA SURVEY PHOTO LOG

1. Fauna Observation Points

Observation Point 1, Site E. Native koa-ʻōhiʻa forest with halapepe (*Dracaena aurea*) in background.

Observation Point 2, Site E. Fence line separating native koa-ʻōhiʻa forest from maintained lawn.

Observation Point 3, Site E. Invasive Florida blackberry and grasses with koa and non-native forest in background.

Observation Point 4, Site D. Invasives lantana shrubs with strawberry guava at edge of koa and non-native forest.

Observation Point 5, Site D. Mixed native and non-native forest patch and meadow adjacent to Navy infrastructure.

Observation Point 6, Site D. Meadow and mixed koa and non-native forest edge habitat at fenceline near access road.

Observation Point 7, Site C. Open meadow grassland with koa and non-native forest in background.

Observation Point 8, Site C. Open meadow with mixed koa non-native forest and Navy structures in background.

Observation Point 9, Site C. Non-native grasses and Daisy fleabane (*Erigeron karvinskianus*) meadow and native koa-ʻōhiʻa forest.

Observation Point 10, Site C. Native koa-ʻōhiʻa forest with pūkiawe and ʻukiʻuki.

Observation Point 11, Site B. Native koa-ʻōhiʻa forest with sparse invasive strawberry guava.

Observation Point 12, Site A. Native koa-ʻōhiʻa forest and maintained lawn strip at road edge.

Observation Point 13, Site A. Mixed koa non-native forest with invasive strawberry guava and natives in understory.

Observation Point 14, Site A. Mixed koa and non-native forest with invasive strawberry guava and natives in understory.

Observation Point 15, Site A. Blackberry, lantana scrub-shrub with mixed koa and non-native forest in background.

2. Site D Restoration of Hawaiian Picture Wing Fly Habitat

Restoration photos of holei (*Ochrosia kaua'iensis*) (top left), *loulu* (*Pritchardia minor*) (top right & bottom left), and alahe'e (*Psydrax odorata*) (bottom right)

APPENDIX C. COMPLETE LIST OF FAUNA

All fauna observed in the KPGO study area, and their relative abundance are noted.

Species (Common Name)	Scientific Name	Life Form	No. of Observations	No. of Individuals	Relative Abundance
Common Myna	*Acridotheres tristis*	Bird	77	101	5%
Red Avadavat	*Amandava amandava*	Bird	3	3	0%
Hawaiian Goose	*Branta sandvicensis*	Bird	2	4	0%
Western Cattle Egret	*Ardea ibis*	Bird	6	7	0%
Domestic Dog	*Canus lupus familiaris*	Mammal	1	2	-
Northern Cardinal	*Cardinalis cardinalis*	Bird	148	151	7%
Kauai Elepaio	*Chasiempis sclateri*	Bird	26	26	1%
Kaua‘i ‘Amakihi	*Chlorodrepanis stejnegeri*	Bird	17	17	1%
White-rumped Shama	*Copsychus malabaricus*	Bird	176	179	9%
Erckel's Francolin	*Pternistis erckelii*	Bird	31	39	2%
Gray Francolin	*Francolinus pondicerianus*	Bird	1	1	0%
Red Junglefowl	*Gallus gallus*	Bird	190	202	10%
Zebra Dove	*Geopelia striata*	Bird	9	18	1%
House Finch	*Haemorhous mexicanus*	Bird	108	120	6%
‘Apapane	*Himatione sanguinea*	Bird	11	11	1%
Japanese Bush Warbler (Uguisu)	*Horornis diphone*	Bird	133	135	7%
Hwamei (Melodius Laughingthrush)	*Garrulax canorus*	Bird	44	44	2%
Chestnut Munia	*Lonchura atricapilla*	Bird	2	3	0%
Scaly-breasted Munia	*Lonchura punctulata*	Bird	23	38	2%
‘Anianiau	*Magumma parva*	Bird	17	17	1%
Northern Mockingbird	*Mimus polyglottos*	Bird	3	3	0%
Black-tailed Deer	*Odocoileus hemionus hemionus*	Mammal	1	1	-
Red-crested Cardinal	*Paroaria coronata*	Bird	72	79	4%
House Sparrow	*Passer domesticus*	Bird	3	4	0%
White-tailed Tropic Bird	*Phaethon lepturus*	Bird	2	2	0%
Pacific Golden Plover (Kōlea)	*Pluvialis fulva*	Bird	8	9	0%
Saffron Finch	*Sicalis flaveola*	Bird	49	63	3%
Spotted Dove	*Spilopelia chinensis*	Bird	23	38	2%
Scarlet Honeycreeper (‘I‘iwi)	*Drepanis coccinea*	Bird	3	3	0%
Warbling White-eye (Mejiro)	*Zosterops japonicus*	Bird	524	743	36%

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Relevant Biological Opinions

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
2014-F-0066

SEP 0 9 2014

Captain M.D. Williamson
Department of the Navy
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Joint Base Pearl Harbor-Hickam, Hawaii 96860

Subject: Formal Consultation for Pacific Missile Range Facility Base-wide Infrastructure, Operations, and Maintenance, Kauai

Dear Captain M.D. Williamson:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological and conference opinions on the proposed Pacific Missile Range Facility (PMRF) Base-wide Infrastructure, Operations, and Maintenance, located on the island of Kauai. Based on coordination with our office, the U.S. Department of the Navy (Navy) and the Department of Energy, National Nuclear Security Administration (NNSA) determined the proposed project may affect eight federally listed species and one candidate species. At issue are potential impacts to the endangered Hawaiian black-necked stilt (*Himantopus mexicanus knudseni)*, Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian goose (*Branta sandvicensis*), Hawaiian hoary bat (*Lasiurus cinereus semotus*), and Hawaiian petrel (*Pterodroma sandwichensis*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*), and the candidate band-rumped storm-petrel (*Oceanodroma castro*), in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C 1531 et seq.). The Hawaiian stilt, moorhen, coot, and duck are hereafter collectively referred to as "Hawaiian waterbirds." Formal consultation was initiated on June 20, 2014 when final details of the Naval Facilities Engineering Command Pacific's (NAVFAC Pacific) Biological Assessment (BA) (i.e., project description) were provided to our office.

We acknowledge the Navy and the NNSA made the determination that the proposed action will have no effect to two species of endangered plants (*Wilkesia hobdyi* and *Spermolepis hawaiiensis*), the Short-tailed albatross (*Phoebastria albatrus*), two species of endangered Hawaiian picture-wing flies (*Drosophila musaphilia* and *Drosophila sharpi*), and the critical habitat (currently unoccupied) for the endangered Lauehu plant (*Panicum niihauense*). The

TAKE PRIDE IN AMERICA

Navy and NNSA state in the BA that the critical habitat is protected from human disturbance by enforcing no trespassing by the public and an off-limits policy for PMRF personnel and visitors. The Navy and NNSA also state that the populations of *Wilkesia hobdyi* and *Spermolepis hawaiiensis* which occur in the action area at Makaha Ridge are located on steep cliffs and slopes away from the PMRF site which prevents human disturbance.

The Navy and NNSA requests our concurrence with the determination that the proposed action may affect but is not likely to adversely affect (NLAA) the green sea turtle (*Chelonia mydas*). To reduce or eliminate the potential for take of this species, the Navy and NNSA proposed the following avoidance and minimization measures: PMRF personnel (1) actively survey for and monitor turtle nests; (2) excavate hatched nests for additional hatchlings; (3) survey for and rescue any adults that may become stranded on the beach; and (4) ensure that light attraction does not become a problem for adult turtles or hatchlings. Additionally, Conservation Measures to reduce artificial night lighting are described in the BA and in the "Description of the Proposed Action" section of these biological and conference opinions. Based on the above avoidance and minimization measures as well as the inclusion of the conservation measures to reduce night lighting, the Service concurs with your determination that the proposed project may affect, but is not likely to adversely affect the green sea turtle.

These biological and conference opinions are based on the following: (1) the NAVFAC Pacific BA; (2) a site visit completed on May 20, 2014; (3) email and verbal communication between our staff and Dr. Angela Anders and Cory Campora of NAVFAC Pacific; (4) Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan (USFWS 1983); (5) Recovery Plan for the Hawaiian Hoary Bat (USFWS 1998); (6) Draft Revised Recovery Plan for the Hawaiian Goose (USFWS 2004); (7) Recovery Plan for Hawaiian Waterbirds, Second Revision (USFWS 2011); (8) other biological literature (see Literature Cited); and (9) information contained in our files. Our log number for this consultation is 2014-F-0066. Copies of pertinent materials and documentation are maintained in an administrative record in the Service's Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii. These biological and conference opinions address the effects of PMRF base-wide infrastructure, operations, and maintenance on the island of Kauai throughout the foreseeable future.

Consultation History

The Service has been working with the Navy for many years to assist in the conservation and management of listed species and critical habitat on Navy lands on the island of Kauai. Early coordination for activities at the PMRF installation pertaining directly to this consultation began officially in April 2010 when the Navy requested initiation of formal consultation on the effects of facility lighting and communication towers on the Newell's shearwater, the Hawaiian petrel, and a formal conference opinion on the band-rumped storm petrel. The Service responded in a letter in May 2010 and recommended that the consultation be expanded to include all ongoing infrastructure, operations, and maintenance on all federally listed species at PMRF. The Navy expanded the scope of the BA to include all operations and species, and requested comments on the pre-draft BA in December 2011. The NNSA's Sandia National Laboratory (SNL) runs the Kauai Test Facility sites at Barking Sands, and the Navy and NNSA requested co-issuance of the

biological opinion in order to approve launches from KTF. The Service continued technical assistance to the Navy and NNSA in 2012 and 2013 by providing recommendations and comments to assist the development of a draft BA.

September 2013, the Service received from the Navy and NNSA a draft BA for PMRF's ongoing base infrastructure, operations, and maintenance and a letter requesting to initiate formal consultation. The following represents a detailed chronology of actions and correspondence applicable to finalizing the draft BA and beginning work on these biological and conference opinions.

November 19, 2013: The Service met with Dr. Angela Anders and Cory Campora of NAVFAC Pacific to discuss elements of the BA that required additional information or clarification. Based on that conversation, the Service anticipated that additional details would be submitted to the Service regarding a proposed project for the conservation of listed Hawaiian seabirds, as well as clarification on PMRF's strategic approach to limiting the bird-aircraft strike hazard (BASH) risk of Hawaiian geese.

November 22, 2013: The Service sent a letter to NAVFAC Pacific indicating that, although additional details were forthcoming, there was sufficient information to initiate formal consultation as of November 19, 2013. Section 7 of the ESA allows the Service 135 days from initiation or reinitiation of formal consultation to complete a biological opinion. Therefore, the scheduled due date was set for April 3, 2014.

January 23, 2014: Michelle Bogardus and Jiny Kim of the Service met with Cory Campora (in person) and Dr. Angela Anders (on conference call) of NAVFAC Pacific to discuss requested information needed for the biological opinion. NAVFAC Pacific would provide additional details after discussing possible options for the proposed Hawaiian seabird conservation project. Also, NAVFAC Pacific requested removal of the proposed Hawaiian goose translocation project from the BA. PMRF made the determination that the proposed actions may also affect, and is likely to adversely affect, the federally endangered Hawaiian petrel and a candidate for listing, the band-rumped storm-petrel.

January 28, 2014: Dr. Angela Anders of NAVFAC Pacific emailed the Service a habitat modification proposal and pilot study for excluding Hawaiian geese and Laysan albatrosses from PMRF airfield.

Feburary 27, 2014: Jiny Kim of the Service emailed NAVFAC Pacific a request for a written plan of PMRF's proposed seabird colony conservation project that clearly describes the direct measurable benefits for seabirds.

March 12, 2014: At this time, the Service had not received sufficient details regarding PMRF's proposed project for the conservation of Hawaiian seabirds. Jiny Kim of the Service emailed NAVFAC Pacific notification that there would be a delay in the scheduled due date of the biological opinion.

May 1, 2014: Adam Griesemer and Aaron Nadig of the Service met with Cory Campora (in person) and Dr. Angela Anders (on conference call) of NAVFAC Pacific to discuss the information pertaining Hawaiian seabird conservation measures needed for the biological opinion. NAVFAC Pacific provided an update on funding request details for section 7(a)(1) projects.

May 5, 2014: Dr. Angela Anders of NAVFAC Pacific emailed the Service a summary of information from the BA pertaining to Newell's shearwater, including updates from fall of 2013.

May 7, 2014: Adam Griesemer of the Service emailed NAVFAC Pacific to request additional details on PMRF's proposed seabird colony conservation project

May 20, 2014: Adam Griesemer of the Service conducted a site visit with Thomas Savre (NAVFAC Pacific) for the proposed project.

May 30, 2014: The Service received via email a revised BA for the base-wide consultation, including revisions sections of the BA pertaining to Hawaiian seabirds and Hawaiian geese.

June 4, 2014: The Service reviewed the project description and emailed a request to Dr. Angela Anders of NAVFAC Pacific for additional details on the specific actions of the seabird conservation measures. Also, the Service requested additional details and provided recommendations for NAVFAC Pacific's strategy to minimize impacts to the Hawaiian goose at PMRF.

June 5, 2014: Dr. Angela Anders of NAVFAC Pacific via email to Adam Griesemer of the Service indicated that NAVFAC Pacific would provide details regarding seabird conservation for discussion in the next conference call and proposed that a comprehensive management plan for Hawaiian goose be included in the project description.

June 19, 2014: Adam Griesemer and Aaron Nadig of the Service met via conference call with Cory Campora, Dr. Angela Anders, and Thomas Savre of NAVFAC Pacific to discuss final details and recommendations needed for the biological opinion pertaining to the Hawaiian goose, Hawaiian hoary bat, and Hawaiian seabirds.

June 20, 2014: Dr. Angela Anders of NAVFAC Pacific emailed the Service revisions to the BA. The Service's work on the biological opinion began again.

August 25, 2014: Dr. Angela Anders of NAVFAC Pacific emailed the Service a revised BA, including updated conservation measures for Hawaiian seabirds.

BIOLOGICAL AND CONFERENCE OPINIONS

DESCRIPTION OF THE PROPOSED ACTION

PMRF, a U.S. Navy installation, provides integrated range services for multiple Department of Defense (DoD) and NNSA activities. PMRF is the largest instrumented multi-environment test range in the U.S. and includes land, sea, and air zones. The range services accommodate training, tactics development, and evaluation for air, surface, and subsurface weapons systems for DoD and other U.S. departments and agencies, foreign military forces, and private industry. PMRF maintains facilities and provides services to support Pacific Fleet underwater, surface, and air training exercises and other activities designed by the Chief of Naval Operations.

The scope of these biological and conference opinions includes all current and ongoing base infrastructure, operations, and maintenance activities at all terrestrial PMRF sites on the island of Kauai, including activities of tenant and customer DoD commands and other federal agencies. PMRF Main Base is located at Barking Sands, which has training and Research, Development, Test, & Evaluation (RDT&E) activities areas for tracing and surveillance radars, data processing, communications networks, and an airfield. In addition to the main base at Barking Sands, PMRF is comprised of support facilities on the island of Kauai at Makaha Ridge, (secondary range), Kokee (tracking radars, telemetry, communications, command and control), Kamokala Ridge (munitions storage), Port Allen (pier for weapons recovery and Navy Seaborne Powered Targets (SEPTAR) boats), and Milolii Ridge (reflectors) (Commander Navy Region Hawaii 2010).

Although KTF previously included an area on Mount Kahili as a communications repeater site, the site is no longer used by KTF and all NNSA-owned telemetry and data acquisition equipment was removed. Mount Kahili will not be addressed further in this document.

Action Area

The action area of a project is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). Firstly, the action area for this project includes the main base of PMRF, known as Barking Sands. Secondly, the action area includes all of Mana Plain, which surrounds Barking Sands, because the proposed action may cause Hawaiian geese to fly outside of the Barking Sands boundary. Thirdly, in addition to the Barking Sands and the surrounding Mana Plain, the action area is comprised of several smaller sites located at Makaha Ridge, Kokee, Kamokala Ridge, Port Allen, and Miolii Ridge. Lastly, the action area also includes the all of the Na Pali Coast, from Haena to Polihale state parks, where actions will be implemented to benefit listed seabird species.

Details of the sites which encompass the action area are provided below based on descriptions found in the draft BA and current conditions sections of the 2010 PMRF INRMP (Commander Navy Region Hawaii 2010). Additional details including maps and pictures of each PMRF site are provided in the 2010 PMRF INRMP.

Barking Sands is located along the Mana Plain on the western coastline of Kauai (Figure 1). The base is approximately 7 miles long and 0.5 miles wide, encompassing approximately 2,060 acres. Barking Sands is bordered to the north by Polihale State Park and to the south by Kokole Point. Barking Sands is bordered to the east by agricultural lands, which continue across the Mana Plain to the mountains of central Kauai. Barking Sands is bordered to the west by the Pacific Ocean, with a coastline dominated by sand beaches, beach barrier dunes, and beach strand vegetation. The Nohili Dunes provide the highest elevation at Barking Sands, approximately 100 feet. The drainage ditches constitute most of the surface water within Barking Sands.

Mana Plain extends across coastal leeward Kauai and is bordered by Makaha Ridge to the east, Na Pali coastline to the north, and Pacific Ocean to the west and south. Mana Plain once contained expansive wetland habitats that supported a variety of native plant and wildlife species. Prior to its drainage and conversion to agricultural lands during the 1900s, approximately 1,700 acres of permanent, semi-permanent, and seasonal wetlands were present on Mana Plain. Approximately 200 acres of wetland remain, predominantly within the DOFAW managed Mana Plains Forest Reserve and Kawaiele Waterbird Sanctuary. These managed wetland sites have been partially restored in an effort to increase breeding and foraging habitat for the endangered Hawaiian duck, Hawaiian coot, Hawaiian moorhen and Hawaiian stilt. Other areas on Mana Plain remain degraded, but do provide minimally beneficial habitat for Hawaiian waterbirds and Hawaiian geese.

Makaha Ridge is a finger ridge of the Na Pali coast which occurs on the west-northwest side of Kauai to the northeast of Barking Sands (Figure 3). The elevation at Makaha Ridge ranges from 1,460 feet at the cliff faces to 1,850 feet at the eastern perimeter. The site covers 244 acres and lies approximately 7 miles north of Barking Sands within State of Hawaii forest reserve areas. Steep slopes surround the station to the south, west, and north. Water drainage paths exist at the site; however, there are no perennial surface water features.

The Kokee sites of PMRF (Figure 4) occur along Kaunuohua Ridge which, near the northwestern terminus of Waimea Canyon. Kokee State Park borders the sites on all sides, and forested areas extend within the property boundaries. The Kokee sites are located on five small parcels that total 16 acres of land, which range in elevation from 3,710 to 3,800 feet. No surface water resources occur at the sites.

The Kamokala Ridge Magazines is located approximately 1.5 miles east of Barking Sands cover 89 acres on the western side of the ridge (Figure 1). Elevation of the site ranges from 240 to 320 feet. The ridge is located on the western edge of the Puu Ka Pele, an upland area with numerous valleys that are characterized by rock outcrops and lowland dry vegetation. The Mana plain extends to the west of Kamokala Ridge. There are no perennial surface water features at the site.

The PMRF Port Allen site is on the southern shore of Kauai. At this site, the Navy leases the west side of the pier and west side of the pier building from the State of Hawaii. The total area of the leased site is 1.0 acre. Because the Navy does not have jurisdiction over the lighting conditions on the east side of the pier, owned and operated by the State of Hawaii, the action area is restricted to the Navy-leased property on the east side of the building and pier.

The Miolii Ridge site is comprised of three small 10-foot^2 reflector sites. The Miolii Ridge site is included in the action area, however, as stated above, there are no facilities that occur at the site. The Miolii Ridge site will not be addressed further in this document.

The Na Pali Coast in the northwest of Kauai, extends from Haena to Polihale State Park. The elevation along the coast ranges from sea level to 3,700 feet in Kokee. The Na Pali region is characterized as a coastal cliff formation with numerous upland finger ridges, precipitous cliffs, and deeply incised valleys. The proposed seabird conservation site located at Honopu Valley occurs along the central Na Pali Coast between Kalalau Valley to the east and Awaawapuhi Valley to the west. The area where predator control will be carried out is situated on the rim of the valley, above the steep slopes and cliff walls, and extends along the Honopu trail in the State of Hawaii Na Pali Kona Forest Reserve. The elevation in the rim areas ranges from approximately 2,700 to 3,600 feet.

PMRF Main Base – Barking Sands

Barking Sands is the principal operations area for PMRF and supports surface, subsurface, air, and space activities (Commander Navy Region Hawaii 2010). Tracking and surveillance radars, data processing, and other communications networks are contained within RDT&E activity areas. Nohili Ditch and Kinikini Ditch separates Barking Sands into three zones: north, central, and south (Figure 1).

The northern third of Barking Sands, north of Nohili Ditch, comprises KTF, an area managed and operated by DOE/NNSA's SNL for missile assembly and launch operations and associated support activities, administration, and services. SNL operates Sandia's Strategic Target System (STARS) and rail-launched sounding rocket launches from KTF. Within the DOE/NNSA Work For Others program, SNL also conducts missile launches for DoD components, including the MDA. KTF personnel conduct test operations to support materials research, components development, advanced reentry vehicle technologies, water entry and recovery systems, and missile defense testing (www.sandia.gov/locations/ktf). Access to KTF, including the Nohili Dune area (the western boundary of KTF), is controlled and limited at all times. Polihale State Park, to the north of KTF, provides beach dune, camping, and surfing activities to the public. Temporary closures of State of Hawaii access roads and beach areas at Polihale occur during missile launches from KTF.

In addition to housing KTF, the northern third of Barking Sands contains U.S. Army/MDA Terminal High Altitude Area Defense (THAAD) missile launch facilities, a 50K launch pad, and the Aegis Ashore Test Center. As at KTF, beach and dune areas to the west of the THAAD, 50K, and Aegis launch facilities are off-limits to all PMRF personnel and visitors except for security personnel conducting patrols. Prior to missile launches from any launch pad, the Navy carries out security patrols to ensure no human presence in the Ground Hazard Area during launch activities (Commander Navy Region Hawaii 2010). During pre-launch and other patrols, security all-terrain vehicles (ATVs) are driven between the high tide line and beach berm (i.e. only in non-vegetated areas), and pickup trucks are driven only on existing dirt roads. Any security ATV entering the beach area is required to cross the berm only on designated permanent paths indicated by signage.

The central third of Barking Sands, delineated by Nohili Ditch on the north and Kinikini Ditch on the south (Figure 1) contains a 6,000-foot runway and associated air operations facilities. In addition to the runway, these facilities include a helicopter landing pad, main hangar, and administrative buildings. The airfield supports C5- and C17-type cargo aircraft, tactical aircraft, and helicopters. Operations support aircraft consist primarily of C-26 airplanes used for logistics and range surveillance, and S-61 helicopters used for personnel transfer, logistics, surveillance, and target recovery. Daily touch-and-go practices of cargo airplanes also occur at the airfield. In addition to air operations facilities, the central third of Barking Sands supports base administration, base services, range operations, ordnance maintenance, and fuel supply facilities. The U.S. Army and Hawaii Air National Guard (HIANG) also maintain facilities and carry out missions in this section of the installation.

The southern third of Barking Sands, south of Kinikini Ditch (Figure 1), contains a housing area, personnel support facilities, and additional base operations facilities. Just to the south of Kinikini Ditch lies a recreational beach cottage area consisting of 19 cottages. The cottages are adjacent to the beach which is open to military personnel and their families and beach cottage visitors. The southern third of the base also contains a housing area consisting of approximately 70 units (primarily single-family homes and duplexes), and personnel support facilities that include a Navy Exchange, fitness center, youth center, soccer field, movie theater, and all-hands club. A man-made oxidation pond in this section of the base provides the only surface water on Barking Sands outside of the agricultural drainage ditches. Finally, this southern section of Barking Sands contains communications facilities, an antenna array, and launch facilities, although on a small spatial scale relative to the northern third of the base (Commander Navy Region Hawaii 2010). Barking Sands is surrounded by or contains a total of 6.3 miles of barbed wire fencing, consisting of three-strand barbed wire atop chain link fence.

Figure 1. Map of the Pacific Missile Range Facility on the island of Kauai (Source: Commander Navy Region Hawaii 2010).

Barking Sands Lighting

Night lighting at Barking Sands is associated with base administration, maintenance, personnel support infrastructure, and missile assembly and launch facilities. Anti-Terrorism/Force Protection lighting is used intermittently at Barking Sands missile assembly and launch facilities to protect personnel and assets prior to launch activities. Currently, three missile assembly areas and five launch pads occur in the northern section of Barking Sands, and a launch pad occurs in the southern section of Barking Sands at Kokole Point. All white lights on all launch pads were

replaced with green bulbs prior to the 2010 nocturnal seabird fledging period. The total number of nights per year during which Force Protection lighting is required on these launch pads for all missile launch activities by all supported DoD commands and other federal agencies is currently approximately 90-120 nights. Duration of each event ranges from approximately three days to four weeks, and event schedules are spread out throughout the calendar year. Thus, the number of nights during the three-month nocturnal seabird fledging period (mid-September through mid-December) which require lighting at launch pads is not likely to exceed a total of 30 days.

Barking Sands Communication Towers and Transmission Lines
Fourteen communication towers are located at Barking Sands (Figure 2). In compliance with Federal Aviation Administration (FAA) and Commander Naval Air Systems Command requirements regarding airfield obstruction-lighting, a subset of the communication towers at Barking Sands have aircraft obstruction-lighting at the top of the structure: this lighting consists of two steady-burning, unshielded red bulbs (Federal Aviation Administration 2000 p.13, Commander Naval Air Systems Command 2009 pp.3-4). The height and lighting of all communication towers at Barking Sands is shown in Table 1.

Table 1. General locations, heights, and lighting conditions of communication towers at Barking Sands, Pacific Missile Range Facility, as of September 2008.

Building/Site	**Type of Tower or Antenna**	**Tower Height**	**Obstruction-Lighting**
Bldg 564	Metro tower	96 ft	2 red bulbs
Bldg 515	Calibration lab antennas (2)	80 ft	2 red bulbs
Bldg 556	Pyramid spiral antenna	40 ft	2 red bulbs
Bldg 396	Aircraft beacon tower	66 ft	none
North Gate	HI Telephone microwave tower	165 ft	2 red bulbs
Bldg 1100	Boresight tower	150 ft	2 red bulbs
North of Kokole Point	WWVH radio antennas (2)	90 ft	none
North of Kokole Point	WWVH radio tower	45 ft	none
Bldg 851	Radial curtain antenna tower	110 ft	none
Bldg 852	Radial curtain antenna tower	110 ft	none
Bldg 853	Radial curtain antenna tower	110 ft	none
Bldg 854	Radial curtain antenna tower	110 ft	none
Bldg 822	Communications tower	110 ft	2 red bulbs
Bldg 850	USCG/DGPS tower	200 ft	2 red bulbs

In addition to communication towers, structures with narrow profiles exceeding 26 feet in height at Barking Sands include 121 electrical distribution line poles spread over a distance of approximately 7 miles. Unlike poles supporting 69 kilovolt (kV) transmission lines that run along the main roads of Kauai and stand 70 to 85 feet tall, the poles on Barking Sands support 12 kV distribution lines and are 45 feet in height. This height is within the range of heights of the kiawe trees (*Prosopis pallida)* that dominate the non-native habitat on the base, including roadside habitat, that grow from 30 to 60 feet tall (Commander Navy Region Hawaii 2010 p. 3-51, http://www.ctahr.hawaii.edu/forestry/trees/ CommonTreesHI/CFT_Prosopis_pallida.pdf). In addition, distribution lines on 45-ft poles thoughout Barking Sands are configured in a horizontal

plane, rather than stacked vertically, such that the vertical profile is equivalent to that of a single line. All existing communication towers and power lines at Barking Sands are in use, and there is no plan for removal of any towers or lines at this time.

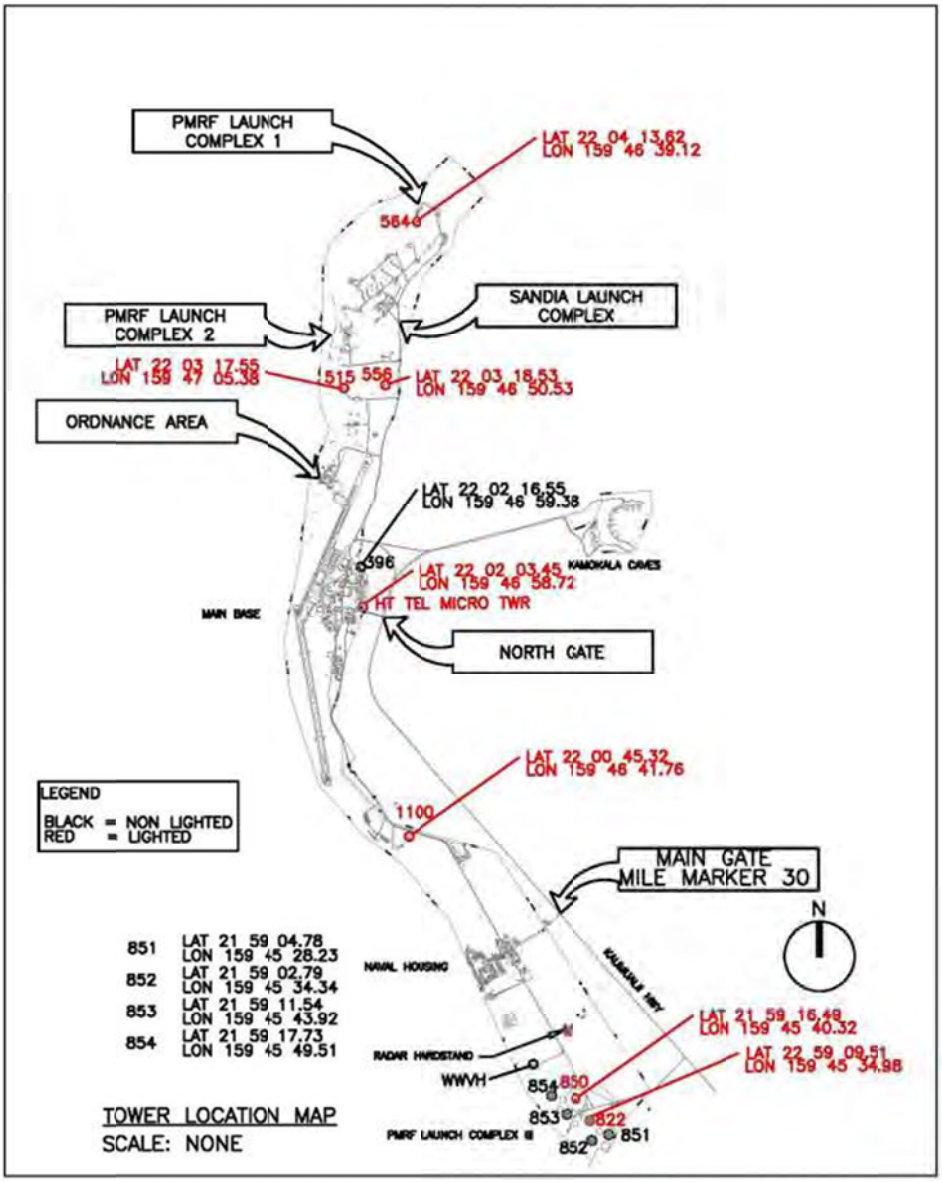

Figure 2. Locations of communication towers at Barking Sands, Pacific Missile Range Facility. Towers indicated by red font contain aircraft obstruction-lighting, consisting of two steady-burning unshielded red bulbs. Towers indicated by black font do not have lighting.

Barking Sands Air Operations and Birds Aircraft Strike Hazard Program

Barking Sands air operations facilities in the central portion of the installation include a 6,000-foot runway, four helicopter landing pads, main hangar, and administrative facilities. The airfield supports military aircraft including, but not limited to, large cargo aircraft, tactical aircraft, and

helicopters. Operations support aircraft consist of C-26 airplanes used for logistics and range surveillance, and S-61 helicopters used for personnel transfer, logistics, surveillance, and target recovery. Daily touch-and-go practices of cargo airplanes also occur at the airfield. Although field carrier landing practices (FCLPs) have not been conducted at the Barking Sands airfield, the potential exists for this training to occur. FCLPs are practices and tests of landing tactical aircraft at a land-based airfield for pilots who will land tactical aircraft on aircraft carriers. Pilots who are in the process of being assigned to aircraft carriers forward-deployed in the western Pacific normally conduct FCLP training on the west coast of the mainland U.S. The airfield at Barking Sands would be used for FCLP training and testing only if a pilot were unable to test on the mainland U.S. prior to travel to the western Pacific due to scheduling reasons.

To minimize the risk of aircraft collisions with birds and other wildlife, Commander Naval Installations Command (CNIC) contracts USDA APHIS Wildlife Services (USDA-WS) to implement an integrated wildlife control operation within the Bird Aircraft Strike Hazard (BASH) zone at Barking Sands. Control methods include lethal techniques for introduced species such as zebra doves (*Geopelia striata*), spotted doves (*Spilopelia chinensis*), mynas (*Acridotheres tristis*), bulbuls (*Pycnonotus* spp.), and mannikins (*Lonchura* spp.). Lethal control is conducted via shooting in high probability bird-strike zones along the runways and taxiways. With non-listed species that are federally protected under the Migratory Bird Treaty Act (MBTA), USDA-WS conducts non-lethal control, including non-lethal trapping/relocation and hazing by personnel on foot or in vehicles. MBTA species managed include, but are not limited to, Laysan albatrosses (*Phoebastria immutabilis*), great frigatebirds (*Fregata minor*), and Pacific golden plovers (*Pluvialis fulva*). PMRF Air Operations maintains a Migratory Bird Permit for management of MBTA-protected species within the BASH zone.

For ESA-listed species, hazing and habitat management are currently the only control methods used to deter birds from foraging, loafing, and nesting on and near the airfield. The goal of the hazing activities is to harass individual birds to the extent that they fly away from the airfield where there is high risk of bird-aircraft strikes. Hazing actions consist of auditory and visual techniques including vehicle horns, human vocalizations, hand clapping, foot stomping, and/or flashing vehicle lights. Although Hawaiian geese, Hawaiian ducks, Hawaiian moorhens, Hawaiian coots, and Hawaiian stilts all occur on PMRF Main Base, hazing is done almost exclusively for Hawaiian geese, with 490 Hawaiian goose hazing events carried out in 2012 and 887 in 2013 (Table 2). Non-nesting Hawaiian geese are currently hazed throughout Barking Sands (all nesting geese and their eggs or goslings are not hazed and are protected via ongoing base-wide predator control operations). A total of 3 Hawaiian duck and12 Hawaiian stilt hazing events occurred between 2005 and 2011 at the PMRF airfield. No Hawaiian moorhens or coots were hazed as part of the BASH program within the past eight years. All Hawaiian ducks and stilts were hazed only on the Barking Sands airfield and not on other areas of the installation.

Table 2. Number of Hawaiian geese hazed at the PMRF airfield between 2005 and 2011.

Species	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
Hawaiian goose	6	7	191	364	641	629	518	490	887

USDA Wildlife Services was authorized through 31 December 2012 to haze ESA-listed birds from airfields in Hawaii via an Agent Designation Letter issued by the Service. However, we

informed the Navy that USDA Agent Designation Letters would not be renewed, such that Navy should address all current hazing activities at PMRF in this base-wide section 7 consultation. An expansion of Hawaiian goose hazing operations at Barking Sands was granted by the Service via a biological opinion issued 10 September 2012 (2012-F-0409). The previous biological opinion allowing for hazing of Hawaiian geese remains in effect through the completion of these biological and conference opinions.

USDA APHIS Wildlife Services and PMRF Air Operations and Environmental personnel will continue to haze Hawaiian geese and Hawaiian waterbirds from Barking Sands. USDA Wildlife Services will train PMRF Air Operations and Environmental personnel in the appropriate use of hazing techniques prior to implementation. Hazing operations by Air Ops and Environmental personnel will occur only within the borders of PMRF Main Base. Hawaiian geese hazing will occur as needed at the PMRF airfield as well as other areas of the installation. Hazing of Hawaiian ducks, stilts, coots, and moorhens will occur as needed only on the Barking Sands airfield, and not at the oxidation pond, drainage ditches, or other areas of the installation.

During the Hawaiian goose nesting and breeding season (September through March), personnel will observe birds prior to hazing actions to determine whether a nest or goslings are present. Brooding adults (i.e. adults with an active nest or goslings) will not be hazed at any time. Observation of a Hawaiian goose nest or gosling(s) will be reported to the USFWS Pacific Islands Fish and Wildlife Office within 24 hours. A summary of hazing techniques used for Hawaiian geese will be provided to USFWS in an annual report. Air Operations and Environmental positions requested to conduct this action are listed in Appendix A.

Makaha Ridge Tracking Station

The Makaha Ridge Tracking Station serves as PMRF's secondary missile tracking and surveillance station (Commander Navy Region Hawaii 2010 pp. 4-1 – 4-2). Structures at the site consist of eight buildings and two lattice-support communication towers (Figure 3). Tracking and surveillance activities occur inside the buildings at Makaha Ridge, including a Frequency Interference Control building, telemetry building, communications building, laboratory, power plant, maintenance facility, and guard shack. Access to Makaha Ridge Tracking Station is limited to assigned personnel and visitors on official business (Commander Navy Region Hawaii 2010 pp. 4-1 – 4-4).

Exterior security lights on buildings at Makaha Ridge are currently unshielded or partially shielded by roof overhangs. In compliance with FAA and Commander Naval Air Systems Command requirements, the two communication towers at this site each have steady-burning, unshielded red bulbs (Federal Aviation Administration 2000 p.13, Commander Naval Air Systems Command 2009 pp.3-4). Transmission lines at the Makaha Ridge site consist of 12 kV distribution lines at a height of 45 feet along a total distance of 0.6 of a mile. Makaha Ridge contains 0.17 of a mile of barbed wire fencing, consisting of three-strand barbed wire atop chain link fence.

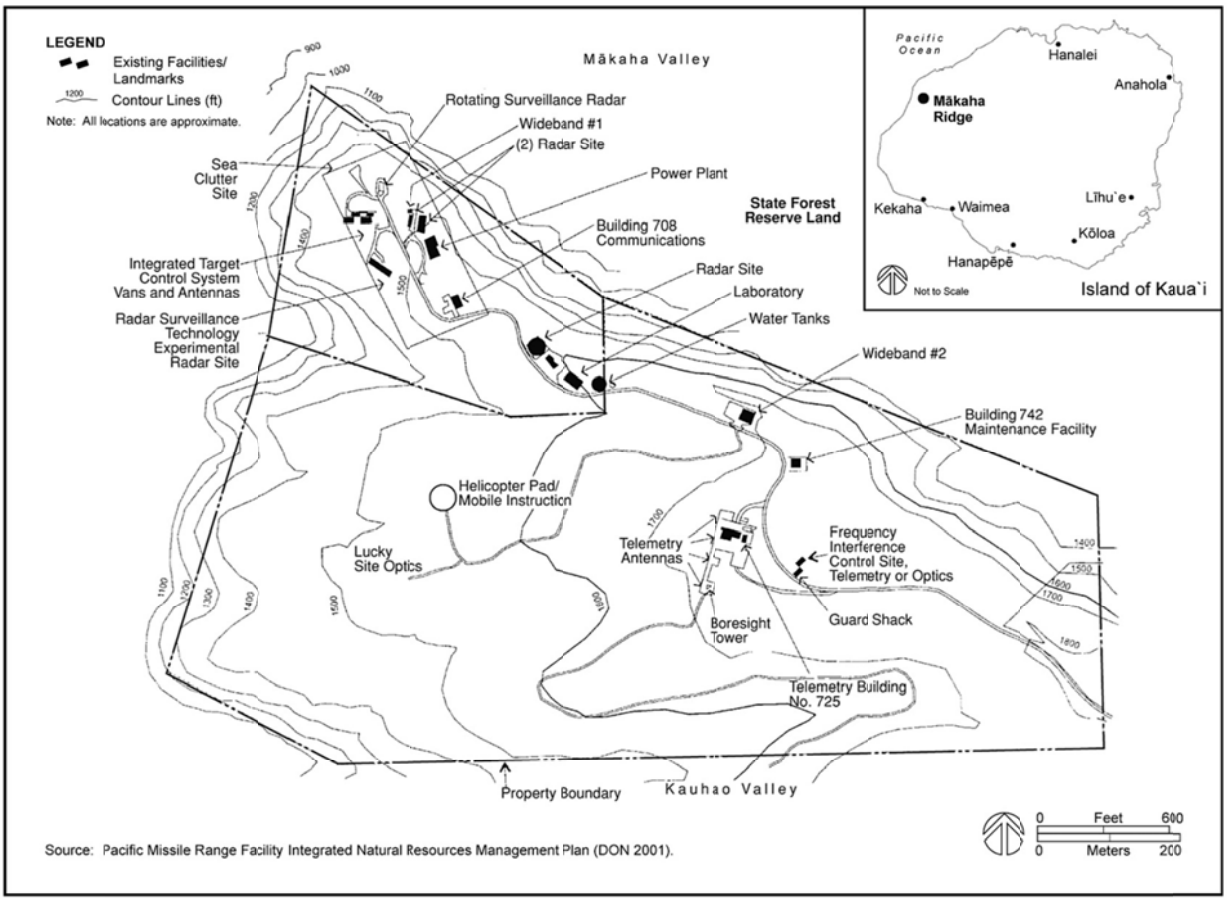

Figure 3. Map of Makaha Ridge site, Pacific Missile Range Facility, on the island of Kauai (Source: Commander Navy Region Hawaii 2010).

Kokee Sites

The Kokee sites of PMRF contain four Navy-operated and maintained buildings in which telemetry, tracking, communications, and command and control operations occur (Kokee Sites A through D, Figure 4). A Geophysical Observatory operated by the National Aeronautics and Space Administration (NASA) is also located at the Kokee sites (Site E, Figure 4). Kokee Site A accommodates tracking and command, training and administration, and logistics support. Site B contains a power plant and fuel storage facility. Site C consists of boresight equipment, operations and maintenance support, a microwave antenna, and radar, and site D contains a transmitter building and antenna support facilities (Commander Navy Region Hawaii 2010 pp. 5-1 – 5-3). Although some U.S. Air Force sites in Hawaii were joint based with Naval Station Pearl Harbor in January 2009, the Air Force site at Kokee was not included in this joint-basing effort. Lighting conditions at the Air Force site at Kokee thus continue to be the responsibility of the Air Force.

Kokee Site A contains only two exterior security lights operated via motion sensors; lights are off unless motion is detected. Site B has no exterior lights. Site C contains a guard shack with

an unshielded exterior security light that remains on at all times, and site D has no exterior lights. The NASA site (Site E) has four facility lights: two low wattage that remain on, and two unshielded lights turned on by personnel only when present at night.

Two lattice-support communication towers occur on the Kokee sites, both at Site E. Each tower has an unshielded steady-burning red light as per FAA and Commander Naval Air Systems Command requirements (Federal Aviation Administration 2000 p.13, Commander Naval Air Systems Command 2009 pp.3-4). No above-ground transmission lines occur on the PMRF Kokee sites. The sites contain a total of 0.03 of a mile of barbed wire fence, consisting of three-strand barbed wire atop chain link fence.

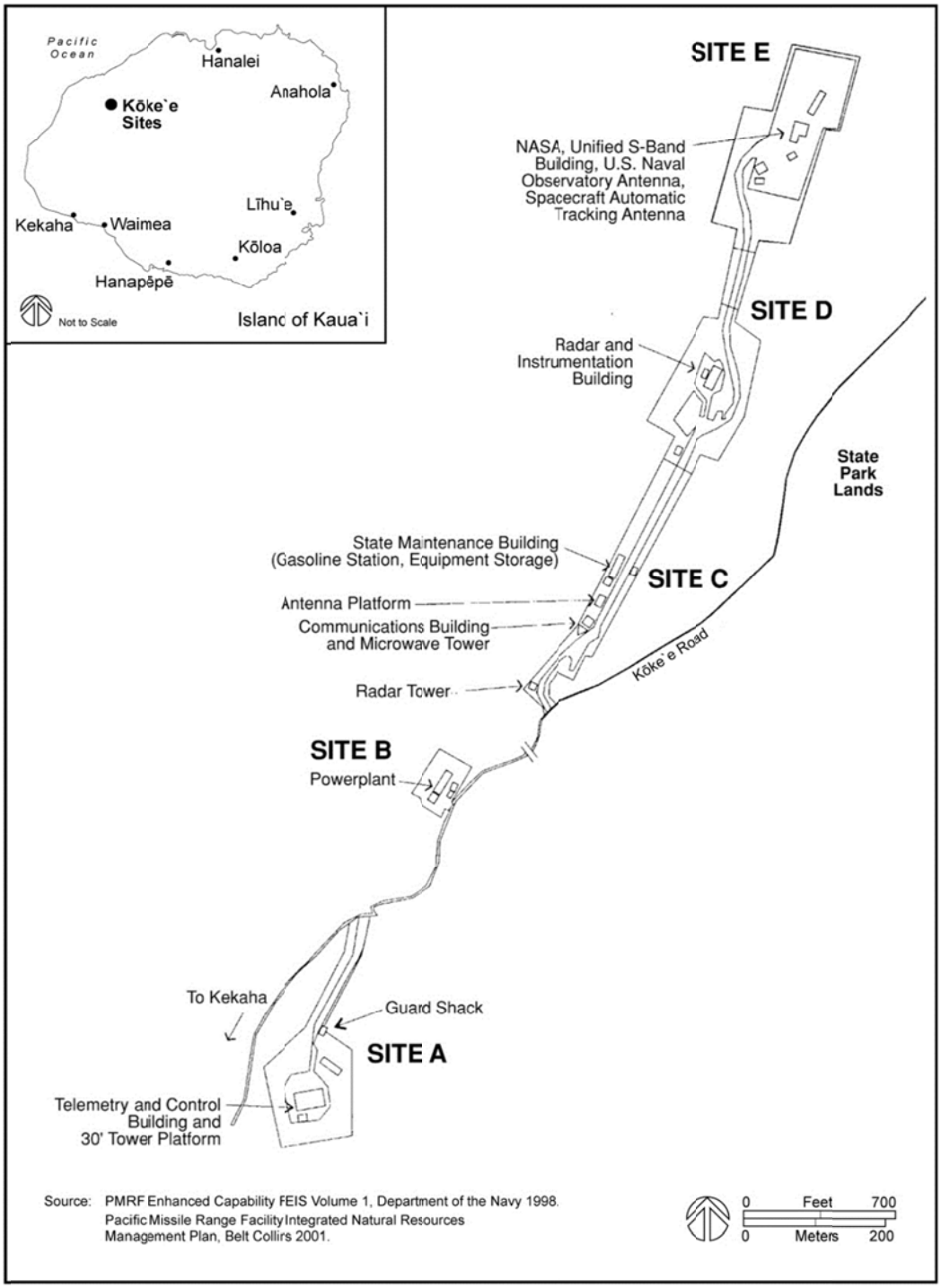

Figure 4. Map of Kokee Sites, Pacific Missile Range Facility, on the island of Kauai (Source: Commander Navy Region Hawaii 2010).

Kamokala Ridge Magazines

The Kamokala Ridge Magazines is located east of Barking Sands (Figure 1). Facilities at the site consist of two earth-covered magazines, 10 ordnance storage magazines excavated into the cliff face, and a missile assembly building. Ordnance is stored for the Navy, Hawaii Air National Guard, Department of Energy, and intermittently for other military commands with training and ordnance storage requirements (Commander Navy Region Hawaii 2010 pp. 6-1 – 6-2).

Per Navy Instruction regarding security lighting for conventional arms, ammunition, and explosives (Department of the Navy 2003), exterior lighting includes three floodlights on each of the two earth-covered magazines and a single incandescent bulb over the doorway of each of the 10 excavated magazines. This site includes 0.33 of a mile of barbed wire fencing, consisting of three-strand barbed wire atop chain link fence.

Port Allen

At Port Allen Boat Harbor, the Navy leases the west side of the pier and pier building from the State of Hawaii. This site provides berthing facilities for three weapons recovery boats and a building for warehousing and support facilities including communications, maintenance/repair, and engineering. Navy Seaborne Powered Targets (SEPTAR) boats are moored at Port Allen as required for training exercises.

Exterior lighting is required at the pier at Port Allen for Anti-Terrorism/Force Protection purposes (Department of the Navy 2007) and to minimize nighttime trip and fall hazards near the water. Eleven lights are mounted under the roof overhang on the west side of the building, and one light is mounted on the front of the building (the northwest corner). The light on the front of the pier building is owned and operated by the Navy. The eleven lights along the west side of the building are operated by Navy, but the light fixtures are State property. These lights are turned on each night for security camera lighting and safety purposes. Six higher-intensity lights are turned on only when personnel are working on docked boats on nights when fueling or upload/offload of equipment occurs. The site contains 0.05 of a mile of barbed wire fencing, consisting of three-strand barbed wire atop chain link fence.

Miolii Ridge

The Miolii Ridge site is comprised of three small 10-foot^2 reflector areas. No facilities occur at the site.

<u>Conservation Measures</u>

The following conservation measures were developed with the Service and the Navy to avoid or minimize impacts to listed species and one candidate species reviewed in this consultation and are considered part of the project description. These include minimization measures that have been implemented at PMRF prior to initiation of this consultation. For conservation measures to compensate for effects of the action, project funds will be requested by Navy via the CNIC INRMP funding process. Implementation of these projects will be contingent upon availability

of INRMP funds. Any changes to, modifications of, or failure to implement these conservation measures may result in the need to reinitiate this consultation.

Newell's Shearwater, Hawaiian Petrel, and Band-rumped Storm-petrel

At Barking Sands, all unnecessary night lighting is now turned off during the nocturnal seabird fledging period. Three of the eight areas determined in 2008 to have the potential to disorient nocturnal seabirds during over-flights of Barking Sands due to unshielded light had night lighting turned off completely during the nocturnal seabird fledging period (September through December) in 2009 through 2013. These areas included KTF facilities (excluding the launch pads and associated facilities), MOGAS, and the all-hands club. In addition, the overhead lighting at the stainless steel garage doors at Bldg 327 and exterior lighting at Bldg 420/422 was turned off.

At Barking Sands and Port Allen, all required night lighting is now full cutoff, except where non-vertical lighting is needed for Anti-Terrorism/Force Protection at the missile launch pads. Although several unshielded lights were identified that can be turned off completely at night to avoid impacts to nocturnally-migrating seabirds, exterior lights are needed for safety or Force Protection at other Barking Sands locations and at Port Allen. Prior to the 2011 nocturnal seabird fledging period, all exterior safety fixtures were realigned or replaced such that they are now full cutoff. Any Anti-Terrorism/Force Protection lighting with non-vertical lighting was fitted with green bulbs. At Port Allen, when higher-intensity Force Protection lighting is needed during boat onloads or offloads, a Biological Monitor will be present. The Biological Monitor will ensure that if a nocturnal seabird is attracted to the lights, they are turned off temporarily such that the bird can fly safely from the area.

For areas of PMRF where night lighting is required for Anti-Terrorism/Force Protection or personnel safety, PMRF's Environmental Coordinator has worked with the Base Operations Support contractor's electrical staff to carry out a Green Lights Project. All white lights > 175 watts were replaced with green bulbs in areas where non-vertical night lighting is required for Anti-Terrorism/Force Protection or safety, including the missile launch pads in the northern and southern sections of the base. The green lights used at PMRF are similar to those used by Poot et al. (2008) in their study on songbirds, shorebirds, and waterbirds at offshore gas platforms.

A. The first phase of the project began in February 2010 to procure sample lights in all ranges of wattage that would work in PMRF's existing exterior light fixtures (all that were not full cutoff fixtures). Field testing was conducted at Barking Sands to determine whether adequate light was produced by the green bulbs for Force Protection and safety.

B. Based on field testing, a decision point to replace white bulbs with green was reached for all fixtures > 175 watts and identified as required to remain on at night at Barking Sands. Replacement of white bulbs with green was completed on all lamps, fixed or portable, between 175 and 1000 watts, prior to the 2010 nocturnal seabird fledging season.

C. All green bulbs have remained in place year-around (i.e. not only during the autumn seabird fledging periods).

D. Fixtures providing light for launch facility ordnance security are all full cut-off and/or contain green bulbs.

E. Portable light carts used for Force Protection are now equipped with two green and two white lights; only the green lights are used during lower Force Protection Conditions (FPCON) status, while white lights are available for higher FPCON status.

For all new construction at all PMRF sites, including that by or for tenant or customer DoD commands or other federal agencies, construction during the nocturnal seabird fledging period (mid-September through mid-December) will be carried out only during the day. Dark-sky friendly lighting will be required for all construction. At Barking Sands, Makaha Ridge, Kokee, and Kamokala Ridge Magazines, for all future construction, lights will be used at night only where required for Force Protection or safety, and all newly-installed fixtures will be full cutoff, with bulbs shielded from above and around all sides. Green light bulbs will be used for fixtures with > 175-watt bulbs, including lighting at missile launch facilities in the northern and southern sections of the base, where compatible with Force Protection requirements.

PMRF supports a seabird collection station for the Save Our Shearwaters (SOS) program. SOS is housed by the Kauai Humane Society and collects birds that have either collided with structures, fallen out, or injured or killed due to exhaustion caused by light attraction. To increase PMRF personnel and visitor knowledge and awareness, the species identification and station instruction signage at the Barking Sands' SOS station were improved in 2009. In addition, a PMRF/SOS Banner donated by the SOS Program was erected inside the Main Gate entrance to Barking Sands.

At Barking Sands, Makaha Ridge, and Kokee, additional monitoring was conducted in 2010 at all communication towers, including scavenger trials, searcher efficiency trials, and carcass searches. Scavenger trials were conducted concurrently with carcass searches and searcher efficiency trials to more thoroughly assess the potential for bird strikes at PMRF communication towers. Additional tower monitoring, scavenger trials, and searcher efficiency trials will be conducted in conjunction with the Five-year INRMP updates for PMRF to continue to assess rates of nocturnal seabird tower strikes.

At Barking Sands, USDA Wildlife Services will continue to conduct base-wide predator control operations to benefit any downed seabirds. Lethal control of rats and owls will continue at Barking Sands. If mongooses should become established on the island of Kauai, lethal control of this species will be carried out as part of base-wide predator control operations. Live trapping of feral cats and dogs for pickup by the Kauai Humane Society at Barking Sands has been funded as a component of PMRF's INRMP. Lethal control of barn owls will be a continued focus for USDA APHIS Wildlife Services: between 2005 and 2010, Wildlife Services removed 112 barn owls from Barking Sands. The majority of barn owls at Barking Sands have been observed and removed at the wedge-tailed shearwater breeding colony in the Beach Cottages area.

Beginning in FY15 and continuing annually, the Navy will also request INRMP funding to conduct predator control at Makaha Ridge, including lethal control of non-native barn owls. The

control of barn owls at Makaha Ridge will benefit nearby colonies of seabirds that are threatened by this avian predator.

The Navy funded a project, in collaboration with the Hawaii DLNR Kauai Endangered Species Recovery Project (KESRP), to use a Remotely Piloted Air Vehicle (RPAV) and ornithological radar to map flight paths and document nesting locations of Hawaiian petrels and Newell's shearwaters on the island of Kauai. As part of this project, KESRP has been subcontracted to ground-truth colony locations based upon RPAV data. If the RPAV does not successfully identify colony locations, KESRP will undertake nest monitoring in currently-known colonies as part of this project. This work was funded by the Navy in FY13 at $250,000.

The Navy provided a full-time Endangered Seabird Field Assistant to KESRP for four months in 2012 (15 May through 15 September). This position was funded by the Navy at a total of $28,000. In the summer of 2013, the Navy also funded KESRP, at approximately $40,000, to conduct nest monitoring in currently-known Newell's shearwater colonies on the island of Kauai.

To aid in protection of nesting colonies of nocturnal seabirds on the island of Kauai, in 2015 and 2016, in addition to predator control operations at Makaha Ridge, the Navy will request funding to implement control of feral cats at Honopu in the ridge areas above the valley or at another site approved by USFWS. The seabird conservation site at Honopu is located within the DLNR Na Pali Kona Forest Reserve in the northwest of Kauai. The site is accessible via Kokee Road and Honopu Trail. Predator control at Honopu or another site approved by USFWS will be initiated as soon as possible following receipt of FY15 INRMP funds by NAVFAC Hawaii. Predator control will be conducted by qualified technicians, such as PMRF Environmental personnel, USDA Wildlife Services, or another contracted entity, and will include the following:

1. Kill traps will be spaced at approximately 500-foot intervals (i.e., every 150 meters) along trails, and will be mounted in boxes set approximately 1 foot above the ground to avoid risk of seabirds being caught in the traps;
2. Cage traps will be spaced at approximately 500-foot intervals (250 feet between kill traps) along trails, and will be checked at least once every 48 hrs;
3. Trail cameras will be placed to monitor for predator activity, and will be checked at least once per week; and
4. Leg hold traps will be deployed during daylight hours in response to cat detections.

The Navy will continue to assess nocturnal seabird conservation opportunities throughout 2015 and 2016 and will coordinate with USFWS on a regular basis to determine the most effective actions to benefit the species. During this time, the Navy will draft a PMRF Seabird Conservation Plan to describe the conservation actions that the Navy will implement through the foreseeable future, commensurate with the level of incidental nocturnal seabird take on the installation. Beginning in 2017, the Navy will begin to implement the actions agreed to via the PMRF Seabird Conservation Plan.

Hawaiian Hoary Bat

To avoid or minimize effects of base infrastructure operations and maintenance on Hawaiian hoary bats, for all current and future construction projects at PMRF that require clearing of trees prior to construction, including construction by or for tenant or customer DoD commands or other federal agencies, clearing will be conducted outside of the Hawaiian hoary bat pupping period (1 June through 15 September) to avoid the felling of potential pupping trees.

An experiment to assess the efficacy of the aluminum tags in preventing bat collisions with barbed wire will be carried out whereby some areas of barbed wire fencing will contain the aluminum tags and other sections of fencing will have no tags as a control treatment. The aluminum tags will be placed along the top of barbed wire fencing at all PMRF sites to provide visual and auditory cues to bats. Two aluminum plant tags will be placed on the top strand of barbed wire halfway between fence posts. The tags will be fastened in a manner that allows them to move about freely in the wind, such that the tags function as a visual cue. And, the tags will be spaced closely enough together that they are able to come into contact with each other and generate an auditory cue.

Prior to and as part of implementation of the study of the efficacy of metal tags in deterring bats from the barbed wire fencelines at PMRF, all fences will be monitored at least once per month on foot and/or by vehicle to quantify bat collisions with barbed wire. The monitoring will compare rates of bat collisions on the aluminum tag treatment versus control barbed wire fencing. Documentation of any entangled bats or evidence of entangled bats will include photographs, latitude/longitude coordinates, date, and time of discovery. Any bat fatalities or injuries will be reported to USFWS within 24 hours of discovery.

If the metal tag deterrents are found to be effective during the study, tags will be added to the entire length of the barbed wire fences at PMRF to avoid or minimize take of bats. If surveys of the barbed wire fencelines at PMRF indicate that take of Hawaiian hoary bats does occur on the installation, Navy will work with USFWS to formulate appropriate compensation for the level of take observed or estimated.

Additional bat population surveys will be conducted at PMRF for the Five-year INRMP Updates via SM2 Song Meter or similar detectors.

Hawaiian Goose

To decrease the potential attractiveness of the PMRF sites to Hawaiian geese in terms of food and nesting resources, PMRF environmental personnel have implemented multiple measures to educate installation personnel and visitors on the critical importance of not feeding Hawaiian geese on the base. To deter Hawaiian geese from all PMRF sites and to minimize additional nesting by geese at Barking Sands, the Navy has increased its communications work with base visitors and staff on the importance of not providing food or water to the birds. Additional signage was added at the Beach Cottages area and inside each cottage indicating the importance of not feeding the birds, and additional discussions have been held with HIANG personnel to ensure that geese are not fed or provided with water in that area of the base.

For all new construction at Barking Sands, including that for tenant or customer DoD commands or other federal agencies, concrete, asphalt, gravel, xeriscaping, or native vegetation, rather than lawn, will be installed in open areas surrounding buildings and parking areas to decrease attraction of Hawaiian geese to these areas.

To protect any Hawaiian goose nests initiated at Barking Sands, Wildlife Services will continue its current base-wide predator control work, including control of feral cats, barn owls, and other non-native predator species. If mongooses should become established on the island of Kauai, lethal control of this species will be carried out as part of the base-wide predator control operations. Funding for predator control work by USDA Wildlife Services at Barking Sands will continue to be included every year in annual funding requests for PMRF natural resource management. Beginning in FY15 and continuing annually, INRMP funding will also be requested to conduct predator control at Makaha Ridge.

The habitat at Barking Sands has been modified to decrease the attractiveness of sites to Hawaiian geese for foraging and nesting. Firstly, two holding ponds along the road adjacent to the south end of the airfield (created to contain drainage ditch floodwaters to keep the road from flooding) were filled, raising them to the elevation of the road and surrounding land. No standing water has occurred in the area after filling of the holding ponds. Secondly, watering of lawns at sites adjacent to the Barking Sands airfield has been ceased entirely, including at the HIANG complex, where Hawaiian goose nesting occurred in multiple years. Lastly, four native plant species that require no irrigation are being evaluated for replacing areas of grass on the base, particularly at and near the southern end of the airfield. Test plots of two of these species, beach morning glory (*Ipomoea pes-caprae*) and aki aki grass (*Sporobolus virginicus*), were planted at the ARDEL site in 2012. The number and species of birds present these sites are being monitored daily, relative to surrounding mowed grass areas, to assess effects on BASH risk if planted on the airfield.

Hawaiian geese at Barking Sands are found most frequently and in greatest numbers along Kinikini Ditch and on the southern end of the airfield. Plans are now being developed to conduct a pilot project to deter Hawaiian geese from the southern end of the airfield by physically blocking access from the Kinikini Ditch basin onto the airfield. This will be done via erection of a barrier within the ditch. Although the barrier will not preclude geese from flying directly onto the airfield, it will prevent geese from walking out of the ditch and onto the airfield which is the access route most often observed. Because geese have not been seen to either forage or attempt to nest on the airfield (i.e., the habitat does not appear to be attractive for these purposes), prevention of walking access at Kinikini Ditch may greatly decrease the number of geese on the airfield. Regular monitoring of geese on the airfield prior to and after construction of the barrier will be conducted to assess effectiveness of the barrier. This project was funded in FY13, and project planning has begun in FY14.

The Navy will continue to assess locations and types of habitat that appear to attract Hawaiian geese to specific areas of Barking Sands, based upon regular monitoring of nesting on the base. Additional habitat modifications will be assessed, and pilot projects will be carried out to determine the most effective methods of reducing Hawaiian goose BASH risk and hazing at the

PMRF airfield. The Navy will work with the Service to continue to identify potential habitat modifications and implement solutions. The Navy will draft a comprehensive Hawaiian Goose Management Plan that will enable the Navy to coordinate with the Service to clearly define conservation goals for Hawaiian geese at PMRF and describe the suite of habitat and population management actions that DON can take going forward to meet those goals.

Hawaiian Waterbirds

Lethal control of rats and barn owls will continue at Barking Sands. Trapping of feral cats and dogs for pickup by the Kauai Humane Society at Barking Sands has been funded as a component of PMRF's INRMP. If mongooses should become established on the island of Kauai, lethal control of this species will be carried out as part of base-wide predator control operations. Funding for predator control work by USDA Wildlife Services at Barking Sands will continue to be included every year in annual funding requests for PMRF natural resource management.

Signage has been placed along the road from north of Kinikini Ditch to the area south of the Kawaiele Wetlands and HIANG Complex indicating that vehicles should slow due to endangered waterbird crossings.

The Navy has received a Botulism Response Standard Operating Procedure (SOP) from the Service for use at PMRF in case of future botulism outbreaks on the island of Kauai.

Surveys of Hawaiian waterbird species will continue to be conducted at the Barking Sands oxidation pond. The pond has been surveyed regularly since March 2012, with an average of five surveys per month. Results indicate a mean of eight stilts and five coots per survey. One Hawaiian duck was observed on the pond between March and September, and no moorhens were observed using the oxidation pond. None of these species were observed nesting on the installation, including areas adjacent to the oxidation pond, but surveys will continue to determine whether any of these waterbirds species nest at the pond in the future.

Any nesting of Hawaiian waterbirds at PMRF will be reported to the USFWS Pacific Islands Fish and Wildlife Office within 24 hours of observation of the nest.

To compensate for hazing of Hawaiian ducks and Hawaiian stilts within PMRF's BASH Program, one or more of the following will be implemented: a) management of the sewage oxidation pond at Barking Sands for Hawaiian ducks and stilts; b) funding of the SOS Program on the island of Kauai for the conservation of waterbirds; c) funding of the predator control program at KPNWR to benefit nesting waterbirds.

STATUS OF THE SPECIES

Newell's Shearwater

Taxonomy and Species Description
The Newell's shearwater is a member of the genus *Puffinus* and utilizes open tropical seas and offshore waters for foraging, returning to land to breed atop forested mountain slopes. The Newell's shearwater is approximately 12 to 14 inches long, with a wingspan of 30 to 35 inches, and weighs approximately 14 ounces. Its plumage is glossy black above, and white below. It has a black bill that is sharply hooked at the tip. Its claws are well adapted for burrow excavation and climbing.

Historic and Current Distribution
Newell's shearwaters were once abundant on all of the main Hawaiian Islands. In 1995 the population estimate, based on at-sea surveys was 84,000 birds (Spear et al. 1995, p. 624), with approximately 90 percent of the population nesting on the island of Kauai. Newell's shearwaters also breed on several other Hawaiian islands, in mountainous terrain between 500-2,300 feet in elevation. This species is known to nest on the islands of Hawaii and Molokai, and may still nest on the island of Oahu. The occurrence on the island of Maui of injured, dead, or grounded adults in the summer, low numbers of radar-detected birds exhibiting Newell's shearwater-like timing of movements, and the presence of juveniles in autumn suggests that this species also nests on the island of Maui.

Recent ornithological radar surveys, combined with returns of downed birds to the Save Our Shearwaters (SOS) program, show an apparent decline of 75 percent in Newell's shearwater between 1993 and 2009 (Day et al. 2003a, Holmes et al. 2009), resulting in a current population estimate of 21,000, with 18,900 on the island of Kauai. Significant range reductions as well as an overall decline in distribution are documented, and at least three colonies documented as being active between 1980 and 1994 are now abandoned (Holmes et al. 2009). As with other long-lived species with low reproductive rates, population modeling has documented that the survival rate of breeding age adults has the biggest impact on the population (Griesemer and Holmes 2011).

Population models incorporating best estimates of Newell's shearwater breeding effort and success yielded a population decreasing at a rate of 3.2 percent annually (Ainley et al. 2001, p. 118). When threat factors resulting in Newell's shearwater mortality were included (predation, light attraction and collision), these models predicted a population decline of 30 to 60 percent over 10 years (Ainley et al. 2001, p. 122).

Life History
Most of the life history information for this species is based on studies of the Kauai population; life histories of birds on other Hawaiian islands may differ slightly. During their nine-month breeding season from April through November, Newell's shearwaters live colonially in burrows under ferns on forested mountain slopes. These burrows are used year after year and usually by the same pair of birds. A single egg is laid in late May or early June (Ainley et al. 1997a, pp. 13-15). Both sexes incubate and this period lasts approximately 45 days. Fledging occurs between

October and November. The Newell's shearwater needs an open downhill flight path to become airborne or combination of sustained wind and suitable topography.

Daily flights of breeding adults to and from the colonies occur only at night and just before dawn. On the island of Kauai, Newell's shearwaters were found to exhibit movement 20-80 minutes after sunset, whereupon they moved inland in a wave that peaked at 35-70 minutes after sunset (KESRP 2014). This peak of movement steadily decreased until 110 minutes after sunset, at which time few birds are seen. In the morning, Newell's shearwaters begin moving to sea approximately 100 minutes before the first measurable light and movement rates increase rapidly and peak an hour before sunrise (KESRP 2014).

Three age classes of Newell's shearwaters are recognized based on demographic factors and assumptions (from Ainley et al. 2001, p. 115): (1) young-of-year; (2) pre-breeding immature/adult (if recognizable); and (3) breeding adults. Only 46 percent of pairs that actively use a burrow actually breed in a given year on the island of Kauai (Ainley et al. 2001, p. 117). First breeding occurs at approximately six years of age (Ainley et al. 1997a, p. 17).

A study of reproductive success at one Newell's shearwater colony on the island of Kauai documented an average annual production of 0.66 young per pair (Ainley et al. 2001, p.117). No specific data exist on the longevity for this species, but other shearwaters may reach 30 years of age or more.

Habitat Description
On the island of Kauai, Newell's shearwaters breed at elevations between 528 and 3,960 feet. Newell's shearwaters usually nest where the terrain is vegetated by an open canopy of trees with an understory of densely matted uluhe ferns (*Dicranopteris linearis*). Some Newell's shearwaters nest in other types of habitat such as on the walls of Waimea Canyon, Kauai, where a forest canopy is absent. Burrows used by Newell's shearwaters are most commonly placed at the base of trees, where the substrate may be easier for the birds to excavate.

Threats, Recovery Strategy, and Ongoing Conservation Measures
The Newell's shearwater was listed as a threatened species in 1975 (USFWS 1983), pursuant to the Endangered Species Preservation Act of 1966. *The Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan* was published in 1983 (USFWS 1983). A species five-year review was completed September 27, 2011 pursuant to Section 4(c)(2) of the ESA. The review recommended up-listing the Newell's shearwater to endangered status due to precipitous decline in populations on the island of Kauai over the last two decades. Critical habitat has not been designated for the Newell's shearwater (USFWS 1983).

Threats to the Newell's shearwater and Hawaiian petrel have been steadily increasing. During the last 150 years, 75 percent of the forests in the main Hawaiian Islands were converted to agricultural, military, commercial or residential land uses, which led to a depletion of available nesting habitat for this species. The introductions of the mongoose (*Herpestes auropunctatus*), black rat (*Rattus rattus*), and Norway rat (*Rattus norvegicus*) have also played a primary role in the reduction of ground-nesting seabirds. Predation by feral cats (*Felis domesticus*) and barn

owls (*Tyto alba*) have also been observed. In addition, feral pigs (*Sus scrofa)* are known to collapse seabird burrows as well as consume or prey upon shearwater adults and young.

Another major threat is the species' attraction to light. Increasing urbanization and the accompanying artificial lights have resulted in substantial problems for fledgling Newell's shearwaters during their first flight to the ocean from their nesting grounds. When attracted to man-made lights, fledglings become confused and may suffer temporary night blindness. They often fly into utility wires, poles, trees, and buildings and fall to the ground, referred to as "fallout". Since 1979 the State's Division of Forestry and Wildlife (DOFAW) on the island of Kauai has supported the SOS program to collect "downed" Newell's shearwaters and Hawaiian petrels (i.e., birds that have either collided with structures or fallen out, or have been injured or killed due to exhaustion caused by light attraction). According to SOS files, over 33,000 seabirds were recovered to date (DOFAW 2008). The majority of the birds are Newell's shearwaters, which nest in greater numbers on the island of Kauai than Hawaiian petrels. The lower number of Hawaiian petrels recovered is thought to be a function of their population size on the island of Kauai, not due to differences in behavior or ability to detect structures in the dark.

The Draft Newell's Shearwater and Hawaiian Petrel Five-year Action Plan describes a recovery strategy that will 1) protect and enhance existing colonies, 2) create new colonies, 3) mitigate existing and new threats by a) implementing and monitoring prioritized management actions at the species level, and b) undertaking research and outreach to support these actions (Holmes et al. 2011). Actions identified to accomplish this strategy include conducting surveys for existing colonies, controlling threats at the highest priority colonies, and minimizing and monitoring man-made threats (e.g., light attraction and power line collisions).

DOFAW has been conducting auditory surveys for new areas containing nesting Newell's shearwaters through their KESRP research program and is developing colony ranking criteria to identify where the objectives of the five-year action plan can be implemented. The minimum conditions necessary to effectively implement colony management that would be expected to achieve a measureable increase in seabird survival and/or reproduction include species presence, access to the areas occupied by breeding seabirds, and landowner authorization and commitment to maintain the managed area in a manner that is consistent with seabird conservation. To date, management actions focused on increasing seabird survival and reproduction are being carried out at only two known nesting colonies occupied by Newell's shearwater (Hono o Na Pali Natural Area Reserve (NAR) and Upper Limahuli Valley Preserve). The State has developed a management plan for the Hono o Na Pali NAR that includes fencing and feral ungulate removal. A 400-acre portion of the privately-owned Upper Limahuli Preserve was fenced to create an ungulate free area for nesting Newell's shearwaters.

While some efforts to protect existing nesting colonies of Newell's shearwater have been implemented on the island of Kauai, they have been limited to constructing ungulate fencing around remaining areas of relatively intact habitat (e.g., Wainiha Valley, Upper Limahuli Valley, etc.). Habitat degradation due to feral ungulates is recognized as the primary threat to native ecosystems in Hawaii and the conservation and restoration of such areas is unsuccessful in the presence of ungulates (Hawaii Conservation Alliance 2005, p. 1). The only active control of cats

and/or rats within an area occupied by nesting Newell's shearwaters on the island of Kauai on private property in Upper Limahuli Valley and the State of Hawaii Hono o Na Pali NAR began in 2010 and 2012 respectively. Funding for seabird conservation work is provided in part through the Kauai Island Utility Cooperative (KIUC) Short-term Seabird Habitat Conservation Plan.

Efforts to reduce the level of light attraction and power line collisions began in the 1980's when KIUC began replacing unshielded street lights with full-cutoff (shielded) lights across the island as part of its normal maintenance program. All of the over 3,500 streetlights operated by KIUC are now shielded, as are the lights at the facilities it operates. In 2002 KIUC prepared an assessment of the power line segments originally identified by Ainley et al. (1995) as causing the most collisions (David and Day 2002). In 2007, KIUC began reconfiguring the lines along one of the "hotspot" areas near Kealia Beach by temporarily changing the uppermost electrical circuit from a vertical to a horizontal arrangement which eliminated three of four wire layers in the circuit and reduced the height by about 10 feet. KIUC has been coordinating with the Federal Highways Administration, Hawaii Department of Transportation, and Hawaii Department of Land and Natural Resources to identify and plan for the undergrounding of certain line segments that pose the most collision risk to seabirds.

DOFAW, in conjunction with the Service, is currently developing an island-wide HCP, known as the Kauai Seabird Habitat Conservation Program (KSHCP). This HCP will provide non-federal entities the opportunity to apply for incidental take of listed seabirds. KSHCP is developing a plan to assist landowners to avoid, minimize, and monitor take at their facilities. To offset take that cannot be avoided, applicants would combine funds to conduct landscape scale conservation actions to benefit listed seabirds. KSHCP is designed to accept multiple applicants in order to mitigate for the island-wide level of take; however given the number of entities believed to have on-going take and scope and scale of potential covered activities, some proportion of current seabird take on the island of Kauai is likely to continue unmitigated even after the completion of the KSHCP.

Hawaiian Petrel

Taxonomy and Species Description

The Hawaiian petrel is a medium-sized seabird in the Pterodromini clade (gadfly-petrels). The Hawaiian petrel is approximately 16 inches long and has a wing span of about three feet. It has a dark gray head, wings, and tail, and a white forehead and belly. The Hawaiian petrel has a stout grayish-black bill that is hooked at the tip, and feet that are pink and black. The Hawaiian petrel was formerly treated as a subspecies of *P. phaeopygia*, and was commonly known as the dark-rumped petrel (USFWS 1983, pp.1-2). The Hawaiian petrel was reclassified as a full species in 1993 because of differences in morphology and vocalization. In 1997 the evolutionary split was confirmed by genetic analyses.

Historic and Current Distribution

The Hawaiian petrel was once abundant on all of the main Hawaiian Islands, except Niihau. Today, Hawaiian petrels breed in high-elevation colonies: primarily on east Maui; Mauna Loa on

Hawaii; on Lanai; to a lesser extent on Kauai; and probably on Molokai, Lehua, and sea stacks off Kahoolawe.

Based on pelagic observations, the total population including juveniles and sub-adults was estimated at 20,000 with a breeding population of 4,500 to 5,000 pairs in 1995 (Spear et al. 1995, p. 629). There have been no total population estimates made since then. Approximately 1,430 breeding pairs are known to occur in the mountains of east Maui. Approximately 1,000 Hawaiian petrel burrows were found in Haleakala National Park, Maui (Bailey, pers. comm. 2011) and an additional 600 breeding pairs are thought to occupy unsurveyed areas of the Haleakala Crater Rim (SWCA 2011). In addition, approximately 55 breeding pairs occupy the Advanced Technology Solar Telescope (ATST) mitigation site (ATST 2010). The Auwahi Wind project biologists have detected an additional 33 active burrows at Kahikinui (Tetra Tech 2012). Ainley (SWCA 2011, Appendix 25, p. 2) estimated a declining Hawaiian petrel population of 600 breeding pairs nesting in the West Maui Mountains. The colony on Mauna Loa, Hawaii is estimated to be approximately 75 breeding pairs (Hu, pers. comm. 2008). Kauai populations are difficult to assess due to topography, and Day and Cooper (1995, p. iv) estimated there were between 1,400 and 7,000 individuals in 1993 on the island of Kauai. Ainley et al. (1997b, p. 28) estimated there were 1,600 breeding pairs of Hawaiian petrels on the island of Kauai. A breeding colony of the Hawaiian petrel was rediscovered on the island of Lanai in 2006, near the summit of Lanaihale. Although the petrel colony was historically known to occur, its status was unknown and thought to have dramatically declined until surveys were conducted in 2006 (Penniman, pers. comm. 2007). The nesting habitat used by the Hawaiian petrel colony on Lanai is delineated by the approximate area of the uluhe fern. Monitoring and research on this population is ongoing, and its size has not been estimated with statistical confidence, but the population appears to be similar in abundance to the Haleakala population, where the largest number of breeding birds is currently known to exist (Penniman, pers. comm. 2011).

Life History

Petrels nest on land and spend much of their time at sea where they are known to feed on squid, small fish, and crustaceans displaced to the surface by schools of tuna (Simons 1985). Hawaiian petrels have been tracked taking single trips exceeding 6,200 miles circumnavigating the north Pacific during the nestling stage. Hawaiian petrels have been recorded in the Gulf of Alaska. Annual survival rates for Hawaiian petrels range from 0.93, in years with no predation to an approximately 0.85 estimated survival under moderate predation at Haleakala (Simons 1984, p. 1070).

Like other procellariiformes, Hawaiian petrels are highly philopatric, returning to the same burrow and mate each year (Simons 1985, pp. 233-234). Beginning in mid-February to early-March, after a winter absence from Hawaii, breeding and non-breeding birds visit their nests regularly at night. From mid-March to mid-April, birds visit their burrows briefly at night on several occasions. In late April or early May, breeding birds return to lay and incubate their eggs (Simons 1985). Non-breeding birds visit the colony from February until late July (Simons and Hodges 1998, pp. 13-14). Information provided by Bailey and Duvall (December 9, 2010), confirmed by Fein's analysis of burrow camera data for the ATST site (Fein, pers. comm. 2009) indicates birds intermittently occupy their burrows during the day during this period as well.

Many non-breeders are young birds seeking mates and prospecting for nest sites, but some proportion is thought to be mature adults that will not breed.

The mean date of egg-laying recorded on Haleakala in 1980 and 1981 was May 8 (Simons 1985, p. 234). The percentage of years in which adult females laid eggs was estimated to be 89 percent (Simons 1985, p. 234). Fecundity (fledglings produced per egg laid) appears to be primarily dependent on rate of predation. Moderate predation is likely to depress fecundity to 0.49 (Simons 1985, p. 237), while no predation or predators present results in a much higher fecundity at 0.72 (Simons 1984, p. 1068). Hawaiian petrel nests are documented to also fail when abandoned by the breeding pair or when eggs are inadvertently crushed during incubation. Annual survival for juveniles at sea is 0.834 (Simons 1984, p. 1070).

Cooper and Day found that Hawaiian petrels flew inland to their nesting areas primarily between sunset and the point of complete darkness. In the morning hours, Hawaiian petrels first move to sea while it was completely dark, starting 60 minutes prior to sunrise, and movement rates increased rapidly until they peaked just after the point of complete darkness was crossed and movement continued at a decreasing rate until sunrise (Day and Cooper 1995, pp. 32-34). Peak fledging, when young seabirds make their first flight to sea, occurs between September 1 and December 1 (Penniman, 2011 pers. comm).

Habitat Description

On the islands of Hawaii and Maui, Hawaiian petrels nest in the cold, xeric environment above 8,000 feet. On the island of Kauai, there is evidence that Hawaiian petrels nest at lower elevations in densely vegetated rainy environments (Ainley et al. 1997b, p. 24). Hawaiian petrels are colonial and nest in burrows, crevices in lava, or under ferns. Burrows detected on Haleakala occur almost exclusively on lava substrates; burrows are located within existing crevasses or excavated in softer material adjacent to rock to boulder-sized lava fragments. Their burrows are generally 3 to 6 feet long (from entrance to nest chamber), although some may be as long as 30 feet (Simons and Hodges 1998, p. 14).

Threats, Recovery Strategies, and Ongoing Conservation Measures

The Hawaiian petrel was listed as endangered in 1967 (USFWS 1983), pursuant to the Endangered Species Preservation Act of 1966. The Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan was published in 1983 (USFWS 1983). A species Five-year review was completed September 30, 2011 pursuant to Section 4(c)(2) of the ESA. Critical habitat has not been designated for the Hawaiian petrel (USFWS 1983).

Hawaiian petrels were abundant and at one time, widely distributed. Their bones have been found in archaeological sites throughout the archipelago (Olson and James 1982a). This species has no natural terrestrial predators other than the Hawaiian short-eared owl, (*Asio flammeus sandwichensis*). Early Polynesian hunting, predation by introduced mammals such as Polynesian rats (*Rattus exulans*), dogs, and pigs, as well as habitat alteration caused initial decline of the Hawaiian petrel population and probably its extirpation from the island of Oahu (Olson and James 1982b, p. 634). The introduction of cats, mongoose, and two additional species of rats (*R. rattus* and *R. norvegiceus*) since Euro-American contact along with accelerating habitat loss has led to small relict colonies of Hawaiian petrels in high-elevation, remote locations. The primary

reason for the relatively large numbers of petrels and their successful breeding around Haleakala summit today is the fencing and intensive predator control maintained by Haleakala National Park since about 1982. If current elevated levels of cat predation continue, significant declines in the Park's relatively protected Hawaiian petrel population are likely (Bailey pers. comm., 2011). Elsewhere on the islands of Maui and in Hawaii, the Hawaiian petrel faces severe threats from non-native predators including rats, cats, mongoose, and introduced barn owls (*Tyto alba*). Ainley (SWCA 2011, Appendix 25, p. 2) modeled the declining population of 600 breeding pairs of Hawaiian petrels in the West Maui Mountains and found that predation impacts may render this relatively large population functionally extinct in 27 years (SWCA 2011, Appendix 24, p. 8). Other significant anthropogenic sources of Hawaiian petrel mortality are light attraction and collision with communication towers, power transmission lines and poles, fences, and other structures (Simons and Hodges 1998, pp. 21-22). Fallout of fledglings, making their first flight to the open ocean, is greatest during the week prior to and following the new moon between September 1 and December 1 (Penniman pers. comm. 2011). These problems are likely to be exacerbated by continuing development and urbanization throughout Hawaii. Predator control in key habitat areas, the establishment of bird salvage-aid stations, and light attraction studies have been initiated to help conserve the Hawaiian petrel.

The recovery goals for the Hawaiian petrel include: 1) protect and enhance existing colonies; 2) create new colonies; 3) mitigate new and existing threats by a) implementing prioritized management actions, and b) undertaking research and outreach to support these actions. Actions identified to accomplish these goals for Hawaiian petrel include conducting surveys for existing colonies, controlling threats at the highest priority colonies, and minimizing and monitoring terrestrial man-made threats (e.g., light attraction and power line collisions).

The KSHCP is being prepared to address adverse human impacts to seabirds on the island of Kauai. In addition, DOFAW's KESRP has been conducting auditory surveys for new areas containing nesting Hawaiian petrels and will use colony ranking criteria to identify areas where recovery actions can be most successful. The State has developed a management plan for the Hono o Na Pali NAR that includes fencing and feral ungulate removal. A 400-acre portion of the privately-owned Upper Limahuli Preserve has been fenced to create an ungulate free area known to contain nesting Hawaiian petrels. Efforts to control feral cats in the Preserve began in 2010; however the landowner does not have funds to sustain these efforts without continued funding obligated through habitat conservation plans or donations from private entities (Bogardus, pers. comm. 2011).

Several of these Hawaiian petrel nesting colonies are being protected from predators pursuant to the KIUC Short-term HCP. Efforts to conserve nesting colonies of Newell's shearwater also benefit Hawaiian petrel, but they have been primarily limited to constructing ungulate fencing around remaining areas of relatively intact habitat (Wainiha Valley, Upper Limahuli Valley, etc.). The only active control of cats and/or rats within an area occupied by nesting Hawaiian petrels on the island of Kauai on private land in Upper Limahuli Valley and in the State of Hawaii Hono o Na Pali NAR started in 2010 and 2012, respectively. The program at Upper Limahuli Valley has no secure funding source to continue the efforts beyond that which will be available through the KIUC Short-term HCP.

Conservation efforts to recover and release live downed seabirds through the SOS program also apply to Hawaiian petrels. Efforts underway to reduce the level of light attraction and power line collisions described for the Newell's shearwater also reduce threats to the Hawaiian petrel. The development of the KSHCP, described above, also pertain to Hawaiian petrels.

Band-rumped storm-petrel

Taxonomy and Species Description
The Band-rumped storm petrel is an intermediate in many respects between Wilson's and Leach's storm-petrels, and is blackish-brown overall with pale wing bars and a clear, curved white band across rump. The tail is slightly forked but this feature is difficult to discern at sea. The Band-rumped storm petrel is approximately 7.5 to 9 inches in length with a 1.5-foot wingspan.

Historic and Current Distribution
The band-rumped storm-petrel is found in several areas of the subtropical Pacific and Atlantic Oceans. In the Pacific, there are three widely separated breeding populations—one in Japan, one in Hawaii, and one in the Galapagos. Populations in Japan and the Galapagos are comparatively large and number in the thousands, while the Hawaiian birds represent a small, remnant population of possibly only a few hundred breeding pairs (Harrison et al. 1990). Band-rumped storm- petrels are most commonly found in close proximity to their respective breeding habitat on islands. The three populations in the Pacific are separated by long distances across the open ocean where birds are not found. Extensive at-sea surveys of the Pacific have revealed a broad gap in distribution of the band-rumped storm- petrel to the east and west of the Hawaiian Islands, indicating that the distribution of birds in the central Pacific around Hawaii is separated from other nesting areas. The available information indicates that distinct populations of band-rumped storm-petrels are definable and that the Hawaiian population is distinct based on geographic and distributional isolation from other band-rumped storm-petrel populations in Japan, the Galapagos, and the Atlantic Ocean. Loss of the Hawaiian population would cause a significant gap in the distribution of the band-rumped storm-petrel in the Pacific, and could result in the complete isolation of the Galapagos and Japan populations without even occasional genetic exchange. Therefore, the Hawaiian population is both discrete and significant, and constitutes a distinct population segment of the larger band-rumped storm-petrel species.

Life History and Habitat Description
The Band-rumped storm petrel is a small seabird and both sexes are alike in size and appearance. The species is long-lived (15-20 years) and probably does not breed until its third year (Ainley 1984). When not at nesting sites, adult band-rumped storm-petrels spend their time foraging on the open ocean (Crossin 1974; Ainley 1984). In the Hawaiian Islands, this species has been found to nest in remote cliff locations on the island of Kauai and Lehua Islet and in barren lava fields above 7,000 feet in elevation on the island of Hawaii (Banko et al. 1991; Wood et al. 2002; VanderWerf et al. 2007; Hu 2005, pers. comm.). Vocalizations of the species were heard in Haleakala Crater on Maui as recently as 2006; however, no nesting sites have been located on the island to date.

Threats, Recovery Strategies, and Ongoing Conservation Measures
The Hawaiian population of Band-rumped storm-petrel was identified as a candidate for listing in 1989 (USFWS 1989). The most recent candidate notice of review for the Hawaiian population of Band-rumped storm-petrel was completed on November 22, 2013 in accordance with Section 4(c)(2) of the ESA.

The significant reduction in numbers and range of the band-rumped storm-petrel is due primarily to predation by nonnative species introduced by humans, including the domestic cat (*Felis catus*), small Indian mongoose (*Herpestes auropunctatus*), common barn owl (*Tyto alba*), black rat (*Rattus rattus*), Polynesian rat (*R. exulans*), and Norway rat (*R.norvegicus*). These non-native predators occur throughout the main Hawaiian Islands, with the exception of the mongoose, which is not established on the island of Kauai. Attraction of fledglings to artificial lights, which disrupt their night-time navigation, resulting in collisions with buildings and other objects, and collisions with artificial structures such as communication towers and utility lines, are also threats. Erosion of nest sites caused by the actions of nonnative ungulates is a potential threat in some locations. Efforts are under way in some areas to reduce light pollution and mitigate the threat of collisions, as well as to control some of the nonnative predators in the Hawaiian Islands; however, the threats remain.

Hawaiian Hoary Bat

Taxonomy and Species Description
The Hawaiian hoary bat is medium-sized (0.5 to 0.8 ounces), with a wingspan of 10.5 to 13.5 inches, and is nocturnal, insectivorous with thick, rounded ears and a furry tail. "Hoary" refers to the white-tinged, frosty appearance of the bat's grayish brown or reddish brown fur. Although females are slightly larger than males, forearm lengths are similar in both genders. These bats are not colonial, and roost solitarily in tree foliage (USFWS 1998, pp. 8-10).

The Hawaiian hoary bat is classified under the Family Vespertilionidae of the Suborder Microchiroptera, and is one of three recognized hoary bat subspecies. The other two subspecies are *Lasiurus cinereus cinereus*, one of the most common and widespread bats in North America, and *Lasiurus cinereus vilosissimus*, which occurs in South America and the Galapagos (Shump and Shump 1982, pp. 1-5). Morphologically, the Hawaiian hoary bat may have diverged significantly from the North American form, as Hawaiian hoary bats are about 45 percent smaller. Climatic conditions necessary to support colonization of Hawaii by hoary bats from North America may have occurred historically (Bonaccorso and McGuire 2013). Also, preliminary genetic analysis indicates the Hawaiian hoary bat may be derived from the North American hoary bat. The low degree of genetic divergence, however, suggests subspecies classification may be appropriate (USFWS 1998, pp. 8-9).

Historic and Current Distribution
The Hawaiian hoary bat is endemic to the State of Hawaii where it is the only existing, native terrestrial mammal. The Hawaiian hoary bat is known to reside on the islands of Hawaii, Maui, Oahu, Lanai, Molokai and Kauai, with the largest populations likely on Hawaii and Kauai. There are no population estimates for the Hawaiian hoary bat and few historical or current records. Unsubstantiated population estimates across the State have ranged from hundreds to a

few thousand individuals (USFWS 1998, p. 14). Data are limited because no feasible method currently exists for surveying the abundance and distribution of solitary, tree-roosting bats. The Hawaiian hoary bat's distribution may be broader than indicated by the current limited information resulting from localized search efforts (USFWS 1998, p. 14).

Hawaiian hoary bats have been observed year-round in a wide variety of habitats and elevations below 7,500 feet, and a few sightings from limited surveys have been reported as high as 13,199 feet. Hawaiian hoary bats have been detected in both wet and dry areas of the island of Hawaii but seem to be more abundant on the drier leeward side (Jacobs 1994, p. 199) and generally less abundant in wet areas (Kepler and Scott 1990, p. 62). Three researchers examined spatial and temporal variation in occurrence patterns of bats in Hawaii, with conflicting conclusions about possible altitudinal or regional migration (Jacobs 1994, pp. 193-200; Menard 2001, pp. 1-149; Tomich 1986, pp. 1-30). However, recent vocalization data recorded over a period of five years (2007-2011) in 25 sample areas across the island of Hawaii indicate that bats concentrate in coastal lowland areas during the breeding season and migrate to highlands in the winter non-breeding season (Gorresen et al. 2013).

Life History and Habitat Description

A comprehensive life history assessment for the Hawaiian hoary bat is lacking. Furthermore, the existing information on population status and habitat ecology is often conflicting. Hawaiian hoary bats roost in a variety of tree species, both native and non-native, during the day and forage in a wide range of habitat types during the night (USFWS 1998, pp. 12-13). There is no information on the Hawaiian hoary bat's average life span, age at first reproduction, and survivorship, or on how age and reproductive condition affect its food habits, habitat selection, home range size, and movement patterns.

A few studies have documented Hawaiian hoary bats in a wide range of locations and habitat types on the island of Hawaii. Bats observed along 611 miles of forest bird survey transects and incidentally elsewhere on Hawaii during 1976-1983, at elevations from sea level to 10,007 feet, were more frequently associated with non-native vegetation (64 percent), such as tall eucalyptus and other exotic plants, than with native vegetation (19 percent) (Kepler and Scott 1990, p. 61). Visual observations and echolocation detections at 22 sites in southeast Hawaii, however, found no significant differences in bat activity among native or non-native vegetation types (Reynolds *et al.* 1998, pp. 153-157). In addition, 57 percent of all bat activity was noted at open sites, forest edges, lava flows, volcanic pit craters, residential and agricultural clearings, and roads. Foraging bats at 14 survey sites over a range of altitudes were more frequently associated with native vegetation (44 percent) than non-native (16 percent) or mixed (9 percent) vegetation (Jacobs 1993, p. 22). Bats were detected most often in native mesic koa-ohia forest vegetation at 13 sites in, and adjacent to, Hakalau Forest National Wildlife Refuge (Cabrera 1996, p. 238). A significant associate between occupancy and mature forest cover has been observed across the island of Hawaii (Gorresen et al. 2013). All reports of bat occurrences may be biased to varying degrees by sampling efforts concentrated along roads and forest edges.

Roosting habitat for the Hawaiian hoary bat is sparsely documented. However, Dr. Frank Bonaccorso's current research project utilizing radio-tracking with more than 30 Hawaiian hoary bats, revealed that all the bats roosted in trees and all roosted more than 20 feet off the ground

(Bonaccorso 2009, pers. comm.). North American hoary bats roost 10 to 16 feet above the ground, mostly in hardwood trees (Shump and Shump 1982, p. 3). Hawaiian hoary bats have been observed in a wide variety of trees, including native species (*Metrosideros polymorpha*; *Pandanus tectorius*; *Styphelia tameiameiae*), Polynesian-introduced species (*Aleurites moluccana*), and post-contact introduced species (*Syzygium cumini*) (USFWS 1998, p. 13). Bats also have been occasionally observed in fern clumps, low scrub, rock crevices, macadamia nut orchards, and buildings (Tomich 1986, pp. 11-24).

Hawaiian hoary bats forage in a variety of open and vegetated habitats, including open fields, lava flows, open-ocean in bays near shore, and streams and ponds. Hawaiian hoary bats on Hawaii forage in both relatively closed habitats near vegetation (such as clearings in lowland mesic ohia forest or town parks) as well as in open habitats and forest edges (Jacobs 1993; Tomich 1974, pp. 10–13). Foraging generally occurs three to 492 feet above the ground or open water, three to 50 feet above the ground in closed forest habitats, and up to 100 feet and more above tree canopy (USFWS1998, p. 10).

As with other life history parameters, little is known about the breeding biology of Hawaiian hoary bats. Females of most temperate, autumn-breeding, insectivorous bat species become pregnant in the spring by delayed ovulation and fertilization, and young are cared for exclusively by the female. The breeding cycle of the Hawaiian hoary bat on the island of Hawaii consists of pregnancy (April to June), with pups born in May or June; lactation (June through early August and possibly to September); post-lactation, after pups have fledged (September to December); and pre-pregnancy (January to March) (Menard 2001, p. 35). Like North American hoary bats, Hawaiian hoary bat females are believed to give birth to two young at a time. North American hoary bat pups cling to the mother at the roost tree during the day, where she leaves them hanging on a twig while she forages at night (Shump and Shump 1982, p. 3), and Hawaiian hoary bats are presumed to behave similarly. Female North American hoary bats adjust their foraging behavior to meet the increasing energy demands of pregnancy and lactation (Barclay 1989, pp. 31-37). Because newborn bats cannot thermoregulate very well in tree-foliage roosts, the mother's foraging activity may be constrained by the need to roost periodically with her young to keep them warm. Thus, foraging behavior changes with reproductive condition, and females with non-volant young may forage at different times of night and perhaps in different habitats than other bats. Preliminary evidence indicates that pregnant and lactating female Hawaiian hoary bats on Hawaii may prefer roosting in lowland areas rather than in the cooler highlands, perhaps because the warmer lowland environment promotes faster juvenile growth (or, alternatively, because insect food sources may be more readily available) (Menard 2001, pp.52-105).

Threats, Recovery Strategy, and Ongoing Conservation Measures

The Hawaiian hoary bat was listed as endangered species in 1970 (USFWS 1970), pursuant to the Endangered Species Preservation Act of 1966. The recovery plan for the Hawaiian hoary bat was published in 1998 (USFWS 1998). A species five-year review has been conducted on in 2011 pursuant to Section 4(c)(2). Critical habitat has not been designated for the Hawaiian hoary bat.

The major threats to the Hawaiian hoary bat are assumed to be the same as those that threaten many bat species in general (Harvey *et al.* 1999, p. 13; USFWS 1998, p. 15). Bats have the slowest reproductive rate and the longest life-span of all mammals of their size (Barclay and Harder 2003, pp. 209-256). Thus, any mortality of breeding-age adults, particularly females, constrains the recovery of the subspecies. The main factor limiting recovery is thought to be habitat loss, primarily the availability of roosting sites as suitable roosting habitat is particularly important to pregnant and lactating females and non-volant young (USFWS 1998, p. 15). Other possible threats identified in the recovery plan may include: roost disturbance, predation by native hawks and non-native feral cats, pesticide use (either directly or by impacting prey species), and alteration of prey availability due to introduction of non-native insects. In addition, occasional instances of Hawaiian hoary bat mortality due to collisions with vehicles and structures have been documented (Kepler and Scott 1990, p. 60; Menard 2001, p.136; Tomich 1986, pp. 11-30). Clearing of vegetation in areas where there are non-volant bat pups may result in the injury or death of those young. Hoary bats also may be impaled on barbed wire in the continental United States (Anderson 2002; Wisely 1978, p. 53) and in Hawaii (Burgett 2009, pers. comm.; Jeffrey 2007, pers. comm.; Marshall 2008, pers. comm.).

The overall recovery strategy for the Hawaiian hoary bat is to rely on research that can provide information on the subspecies' abundance and distribution, life history, and habitat associations. The primary recovery goal should be to conduct research essential to the conservation of the Hawaiian hoary bat. Research should focus on developing standardized survey and monitoring protocols for determining abundance and distribution, roosting habitat associations, basic life history biology, and food habits. Other recovery goals are to protect and manage current populations by identifying and managing threats, including protection of key roosting and foraging areas; conduct a public education program; evaluate progress towards recovery; and revise recovery criteria as necessary (USFWS 1998, pp. 18-20).

The Service, Hawaii Department of Land of Land and Natural Resources – Division of Forestry and Wildlife (DOFAW), and Bat Conservation International (BCI, a nonprofit conservation and education organization) are stakeholders in a public-private Hawaiian Hoary Bat Research Cooperative (Cooperative) which collaboratively prioritizes and funds management-oriented research on the Hawaiian hoary bat's abundance, distribution, and habitat requirements. Major stakeholders include private landowners, agricultural and commercial forestry interests, environmental groups, local governments, and Federal and State agencies. Most of the Cooperative's current funding is provided by the Service's Cooperative Endangered Species Conservation Fund (Section 6 of the Endangered Species Act) grants to the State. The Cooperative awarded funding to the U.S. Geological Survey – Biological Resources Division for telemetry research in years 2004 to 2007, to complete baseline surveys to document Hawaiian hoary bat movements on the island of Hawaii. The Cooperative secured other funding to continue this research through 2009. The Service is also working with several private landowners in the state to develop Habitat Conservation Plans for the Hawaiian hoary bat. All may provide conservation benefits to the population as a whole as well as provide essential information regarding policy and management decisions.

Hawaiian Goose

Taxonomy and Species Description
The Hawaiian goose is a medium-sized goose, with an overall length of approximately 25-27 inches. The plumage of both sexes is similar (USFWS 2004, p.4). This species is adapted to a terrestrial and largely non-migratory lifestyle in the Hawaiian Islands with limited freshwater habitat (USFWS 2004, p.iii). Adaptations to a terrestrial lifestyle include increased hindlimb size, decreased forelimb size, and reduced webbing between the toes compared to other species of *Branta* (Miller 1937, Olson and James 1991). Compared to the related Canada goose (*Branta canadensis*), Hawaiian goose wings are reduced by about 16 percent in size and their flight is weak (USFWS 2004, p.21). Hawaiian geese are capable of inter-island and high altitude flight; however, they do not migrate from the archipelago (Banko et al. 1999, p.9).

Historic and Current Distribution
It is speculated that Hawaiian geese were once widely distributed among the main Hawaiian Islands; however, subfossil evidence has not been found on Oahu or Niihau (USFWS 2004, p.6). The fossil record indicates the prehistoric (prior to 1778) range of Hawaiian geese was much greater than was observed after colonization by Europeans (Banko et al. 1999). However, it is difficult to estimate Hawaiian goose population numbers, either pre-Polynesian or pre-European contact because there is a limited understanding of species composition, or even the gross structure, of the vegetation prior to the arrival of the Polynesians (USFWS 2004, p.7). By 1952, approximately 30 Hawaiian geese remained on Hawaii Island (Smith 1952). The release of captive-bred Hawaiian geese, which began in 1960, helped save the species from imminent extinction (USFWS 2004, p.2-3). As a result of such programs, wild populations of Hawaiian geese now occur on four of the main Hawaiian Islands. As of 2012, the statewide population of wild Hawaiian geese was estimated to have reached 2,457-2,547 individuals; the wild populations on the islands of Hawaii, Maui, Molokai and Kauai were estimated to have 543, 416, 77, and 1,421-1,511 individuals, respectively (NRAG unpublished data).

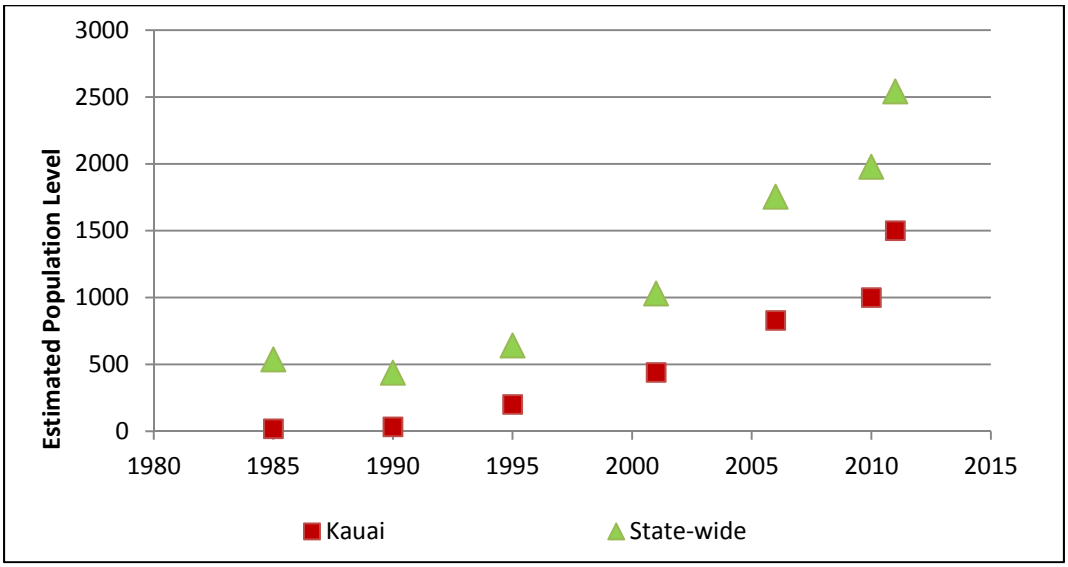

Figure 6. Hawaiian goose population estimated state-wide and on the island of Kauai from 1995 to 2011 (Data provided by NRAG 2011).

Hawaiian geese use shrublands and grasslands and human-altered habitats ranging from coastal to alpine environments (Banko 1988, Banko et al. 1999). On the islands of Hawaii and Maui, Hawaiian geese nest, raise their young, forage, and molt in grassy shrublands and sparsely vegetated lava flows. Some populations on these islands move seasonally from montane foraging grounds to lowland or mid-elevation nesting areas. On the island of Kauai, Hawaiian geese are primarily found utilizing lowland habitats such as coastal wetlands at Hanalei National Wildlife Refuge (NWR), with the exception of the Na Pali Coast (USFWS 2004, pp.15-19) and areas near and in the Makaha Ridge Tracking Station (Marshall, pers. comm. 2012).

In April 2011, Hawaii Governor Neil Abercrombie issued an emergency proclamation (referred to as the "Governor's Proclamation"), that suspended State endangered species and environmental compliance laws for Hawaiian geese at the Kauai Lagoons Resort. The purpose was to allow the Hawaii Department of Land and Natural Resources – Division of Forestry and Wildlife (DOFAW) to act quickly in translocating the Hawaiian goose population at Kauai Lagoons to sites on other islands to reduce the potential for aircraft collisions at the adjacent Lihue Airport. The translocation effort is being conducted under a regulation (50 C.F.R.§17.21(c)(3)(iv)) that allows State employees to take listed species if that species constitutes a "demonstrable but non-immediate threat to human safety." The Governor's Proclamation is effective for five years (beginning in April 2011 and ending in April 2016), during which time DOFAW plans to translocate all Hawaiian geese at Kauai Lagoons, which is estimated to be more than 400 individuals constituting approximately 40 percent of Hawaiian geese on the island of Kauai. This translocation effort will dramatically change the density and distribution of Hawaiian geese on all of the Hawaiian Islands. Although details of how many geese will be sent to each site are still unknown, it is anticipated that more than half will be translocated to the island of Hawaii, approximately 50 to Maui, and the remaining population to Molokai. Further details of the translocation effort can be found in the Hawaiian Goose Translocation Plan developed by DOFAW (DOFAW 2012).

Life History

Hawaiian geese have an extended breeding season with eggs reported from all months except May, June and July, although the majority of birds in the wild nest between October and March (Banko et al. 1999, p.4). Nesting peaks in December and most goslings hatch from December to January (Banko et al. 1999). On the island of Kauai, Hawaiian geese frequently nest earlier (Marshall, pers. comm. 2012). Hawaiian geese nest on the ground, in a shallow scrape in the dense shade of a shrub or other vegetation. A clutch typically contains three to five eggs, and incubation lasts for 29 to 31 days. Once hatched, the young remain in the nest for one to two days (Banko et al. 1999, pp. 16-17). Fledging of captive birds occurs at 10 to 12 weeks, but may be later in the wild. During molt, adults are flightless for a period of four to six weeks, generally attaining their flight feathers at about the same time as their offspring. When flightless, goslings and adults are extremely vulnerable to predators such as cats, dogs, and mongoose. From June to September, family groups join others in post-breeding flocks, often far from nesting areas. Hawaiian geese reach sexual maturity at 1 year of age, but usually do not form pair bonds until the second year. Females tend to nest near their natal nesting area, while males more often disperse (Banko et al. 1999).

Habitat Description
The current distribution of wild Hawaiian geese has been highly influenced by the location of release sites for captive-bred birds (Banko et al. 1999). Hawaiian geese are known to occupy various habitat and vegetation community types ranging from coastal dune vegetation and non-native grasslands (such as golf courses, pastures and rural areas) to sparsely vegetated low- and high-elevation lava flows, mid-elevation native and non-native shrubland, cinder deserts, native alpine grasslands and shrublands, and open and non-native alpine shrubland-woodland community interfaces (Banko et al. 1999, pp.4-6). On the island of Kauai, Hawaiian geese also utilize a number of coastal wetland areas including taro loi (Marshall, pers. comm. 2012). Hawaiian geese are browsing-grazers; the composition of their diet depends largely on the vegetative composition of their surrounding habitats and they appear to be opportunistic in their choice of food plant as long as they meet nutritional demands (Banko et al. 1999, pp.6-8; Woog and Black 2001, p. 324). Hawaiian geese may exhibit seasonal movements to grasslands in periods of low berry production and wet conditions that produce grass with a high water content and resulting higher protein content. The sites used by Hawaiian geese for nesting range from coastal lowland to subalpine zones and demonstrate considerable variability in physiognomic features (Banko et al. 1999, pp.4-5). However, the distribution of Hawaiian goose nesting sites has been influenced by the location of release sites of captive-bred individuals (Banko 1988). Historical reports from the island of Hawaii indicate that Hawaiian geese bred and molted primarily in the lowlands during winter months and moved upslope in the hotter and drier summer months (Henshaw 1902, Munro 1944, Banko 1988). Reproductive success is relatively low in upland habitats on the islands of Hawaii and Maui and higher in lowland habitat on Kauai (Banko et al. 1999, Telfer 1995, 1996).

Threats, Recovery Strategy, and Ongoing Conservation Measures
Approximately 30 Hawaiian geese remained in the wild in 1952 (USFWS 2004, p.2). The Hawaiian goose was named Hawaii's State bird on May 7, 1957 (USFWS 2004, p.46) and captive-breeding efforts began in the 1960s (USFWS 2004, p.2). The Hawaiian goose was federally listed as endangered in 1967 (USFWS 2004, p.3). The Service has not designated critical habitat for the Hawaiian goose (USFWS 2004, p.3). The Hawaiian goose is also listed as endangered by the State of Hawaii (USFWS 2004, p.iii). Although the number of wild Hawaiian geese has substantially increased since 1952, the Hawaiian goose remains one of the most endangered geese in the world (USFWS 2004, p.3).

The current threats to Hawaiian goose recovery are: 1) predation by introduced mammals (especially mongooses, cats, rats, dogs and feral pigs); 2) insufficient nutritional resources due to habitat degradation; 3) limited availability of suitable habitat due to habitat loss, fragmentation and degradation, especially low-land habitat; and 4) human-caused disturbance (including habituation to humans) and mortality (especially death due to vehicle collisions). Additional factors that may be affecting Hawaiian goose recovery but require further research include: 1) behavioral problems associated with small population sizes, captive-bred birds and loss of genetic diversity; and (2) avian disease and parasites (USFWS 2004, p.27-28; Marshall, pers. comm. 2012). It is believed that Hawaiian geese are doing well on the island of Kauai due to greater availability of lowland habitat as well as the lack of an established mongoose population (Banko et al. 1999, USFWS 2004). However, the recent capture of two mongooses on the island of Kauai, one of which is believed to be a juvenile, is a great concern as the mongoose is the

most serious Hawaiian goose egg predator (Banko 1988, Black and Banko 1994, Baker and Baker 1995). The establishment of a mongoose population on the island of Kauai would have future implications in the recovery of Hawaiian geese.

The Service published a Draft Revised Recovery Plan for the species in 2004 and initiated a Five-year Review in 2009. The overall goal of the Service's "Draft Revised Recovery Plan for the Nene or Hawaiian Goose *(Branta sandvicensis)*" is to remove the Hawaiian goose from the Federal list of endangered and threatened wildlife and plants (delisting). The plan establishes a framework within which recovery actions are undertaken to ensure the long-term survival of the Hawaiian goose and to control or reduce the threats to the species to the extent that it is no longer in danger of extinction and warrants delisting. The interim goal is to accomplish increases in population sizes and geographic distribution of Hawaiian geese concomitant with control of threats sufficient to consider reclassification or downlisting of this endangered species to threatened status. To reach the recovery goal, there must be multiple self-sustaining Hawaiian goose populations on the islands of Hawaii, Maui Nui (Maui, Molokai, Lanai, & Kahoolawe) and Kauai, for at least 15 years. Additionally, the threats to the species must be reduced to allow for the long-term viability of these populations, and sufficient suitable habitat must be identified, protected and managed in perpetuity on each of these islands such that the species no longer meets the definition of endangered or threatened under the ESA (USFWS 2004, p.49-50).

With the exception of the island of Kauai, most wild populations of Hawaiian geese are not self-sustaining (Marshall, pers. comm. 2012). The Service defines "self-sustaining" as maintaining or increasing established population levels without additional releases of captive-bred Hawaiian geese, although habitat manipulation, such as predator control or pasture management, may need to be continued. Consideration for delisting can occur once all of the downlisting criteria have been met, and all population levels have shown a stable or increasing trend (from downlisting levels) for a minimum of 15 additional years (i.e., at least 30 years) (USFWS 2004, p.vi). Captive releases have been an important part of the Hawaiian goose recovery strategy and a major factor in saving the Hawaiian goose from extinction and reestablishing it throughout Hawaii (USFWS 2011). However, DOFAW and the Service recently discontinued captive propagation of Hawaiian geese in 2011. Birds from the island of Kauai may be used for future translocation efforts to bolster existing populations and increase state-wide distribution, but because Kauai birds have the lowest genetic diversity of all captive and wild population (Rave 1995), this practice could increase genetic problems (USFWS 2011). In order for Hawaiian goose populations to survive, they must have relatively predator-free breeding areas and sufficient food resources; human-caused disturbance and mortality must be minimized and genetic and behavioral diversity maximized. At the same time, Hawaiian geese are highly adaptable, successfully utilizing a gradient of habitats, ranging from highly altered to completely natural, which bodes well for the recovery of the species (USFWS 2004, pp. iv-vi).

Hawaiian Moorhen

Taxonomy and Species Description

The Hawaiian moorhen is an endemic subspecies of the common moorhen (*Gallinula chloropus*). It is a dark gray bird with a black head and neck, and white feathers on their flanks and on their undertail coverts. They have a distinctive red frontal shield, and their bill tip is

yellow with a red base. Their legs and feet are greenish and without lobes. The Hawaiian moorhen usually measures about 13 inches in length and 11 to 16 ounces in mass, with males typically larger and heavier than the female (Bannor and Kiviat 2002, online p. 2). Both sexes are similar and have chicken-like cackles and croaks. The Hawaiian moorhen is similar to the moorhen on the mainland in appearance. In Hawaiian legend, these birds were thought to have brought fire from the gods to the Hawaiian people.

Historic and Current Distribution

No historical population estimates are available for the endemic Hawaiian moorhen, prior to the first biannual waterbird count by DOFAW in 1977. Because they are such secretive birds, it is difficult to conduct population surveys for this species. It is believed that they were common on the main Hawaiian Islands, except Lanai and Kahoolawe, in the 1800s but radically declined by the mid-1900s. Surveys from the 1950s through the 1960s estimated only 57 individuals (Engilis and Pratt 1993). Currently, Hawaiian moorhen inhabit the islands of Kauai and Oahu (USFWS 2011, p. 37). The State attempted a reintroduction of six Hawaiian moorhen (three females and three males) on May 18, 1983, to the island of Molokai at Kakahaia NWR. At least two birds were present in January 1984, but there have been no confirmed sightings since 1985 (USFWS 2011, p. 40).

Hawaiian moorhen generally occur in wetland habitats below 410 feet in elevation on the islands of Kauai and Oahu, although there have been reports from Keanae Peninsula on Maui and from the island of Hawaii. On the island of Kauai, the largest populations occur in the Hanalei and Wailua river valleys, Waiakalua Reservoir, and Wilcox Ponds (USFWS 2011, p. 40). Hawaiian moorhen also occur in the irrigation canals on the Mana Plain of western Kauai and in taro fields. On the island of Oahu, the species is widely distributed with most birds found between Haleiwa and Waimanalo; small numbers occur at Pearl Harbor and the leeward coast at Lualualei Valley.

Biannual waterbird counts indicate the statewide population of Hawaiian moorhen is stable with an average of 287 birds over 10 years (1998 to 2007), but count numbers are extremely variable between summer and winter surveys (USFWS 2011). While these surveys numbers provide a rough idea of population trends, the counts are thought to be underestimates because of the species' cryptic behavior, and an accurate population estimate is not available. Standard survey methods in these counts include visual and aural detection. Recent research conducted by DesRochers et al. (2008) in 2005 through 2007 has shown that passive surveys of cryptic waterbirds underestimate numbers of individuals present in the wetlands. Alternatively, broadcasting vocalizations of cryptic waterbirds to elicit responses increases detection. On average his research has shown that broadcasting calls increased Hawaiian moorhen detection by 30 percent on the island of Oahu and 56 percent on the island of Kauai.

Life History

Hawaiian moorhen nest year-round but most activity occurs from March through August (USFWS 2011, p. 34). It is believed that the nesting phenology is related to water levels and late succession wetland vegetation. The Hawaiian moorhen usually lays an average of five to six eggs with the incubation period ranging from 19 to 22 days (USFWS 2011, p. 43). Re-nesting and multiple broods during one season have been observed (Byrd and Zeillemaker 1981). Platform nests are constructed in dense vegetation over water or near the waters' edge. The

particular species of emergent plant used for nest construction is not as important as stem density and vegetation height (USFWS 2011, p. 43). Hawaiian moorhen are a precocial species; chicks are covered with down and are able to walk, but are dependent on parents for several weeks. The lifespan of this species is unknown; however, a common moorhen was recaptured after 10.5 years (USFWS 2011).

Habitat Description

Hawaiian moorhen are the most secretive of the native waterbirds, preferring to forage, nest and rest in dense late succession wetland vegetation. Most birds feeding along the waters edge or in open water will quickly seek cover when disturbed. The preferred habitat for Hawaiian moorhen are lowland freshwater habitats; declines have been observed in ponds where freshwater was converted to saltwater (Engilis and Pratt 1993). Key habitat features include interspersed dense stands of robust late succession vegetation near open water, floating or barely emergent mats of vegetation, and water depth less than three feet (USFWS 2011, pp. 45). Hawaiian moorhen are opportunistic feeders and their diet likely varies with habitat, but includes algae, grass seeds, insects, snails, introduced fishes, crustaceans, mollusks, emergent grasses, and wetland plants (USFWS 2011, p. 44).

Threats, Recovery Strategy, and Ongoing Conservation Measures

The Hawaiian moorhen was listed as an endangered species in 1967 (USFWS 1970), pursuant to the Endangered Species Preservation Act of 1966. The original recovery plan was approved in 1978, and revised in 1985. The first draft of the second revision was released on May 1999, followed by the second draft of the second revision in May 2005. A species review has not yet been initiated pursuant to Section 4(c)(2) of the Act which requires five-year review after listing. Critical habitat has not been designated for the Hawaiian moorhen (USFWS 2011).

General Threats and Conservation Needs for all Endangered Hawaiian Waterbirds

Threats and conservation needs are addressed as a combined assessment for all four species of Hawaiian waterbirds: the Hawaiian moorhen, Hawaiian coot, Hawaiian duck, and Hawaiian stilt. We are evaluating the threats and conservation needs on these four species of Hawaiian waterbirds jointly because they share common issues.

The primary causes of the decline of the Hawaiian waterbirds are the loss of wetland habitat, predation by introduced animals, over-hunting in the late 1800s and early 1900s, disease, and environmental contaminants. A significant amount of Hawaii's wetlands have been lost due to human activities, including filing and draining for agriculture, houses, hotels, and golf courses. The Service estimates that 22,475 acres of wetlands existed within the coastal plains of Hawaii in the 1780s. In 1990, the Service estimated that only 15,474 acres remained; a loss of 31 percent (USFWS 2011). The majority of the wetlands that remain are degraded by altered hydrology, invasive species, human encroachment, and contaminants.

In addition to wetland loss, invasion by non-native habitat-modifying plants results in alteration of wetland plant communities and degradation of wetlands. Species such as California grass (*Urochloa mutica*), water hyacinth (*Eichornia crassipes*), Indiane fleabane (*Pluchea indica*) and red mangrove (*Rhizophora mangle*) present a serious threat by outcompeting more desirable species and eliminating open water habitats. Unmanaged vegetation significantly reduces open

water, shallow water, bare ground, and exposed mudflat habitat. All of these habitats are under serious threat without management to control these aggressive plant species (USFWS 2011).

Introduced predators are considered a primary factor limiting Hawaiian waterbird populations. Small Indian mongoose, feral cats, and feral dogs are all presently found within wetlands and pose a serious threat to Hawaiian waterbird reproductive success. All three of these predatory Species are known to take eggs, young birds, and even adults (USFWS 2011). Both cats and dogs are of particular concern because of the close proximity of many of Hawaii's wetlands to urban areas. Other species, such as the cattle egret (*Bubulcus ibis*), American bullfrog (*Rana catesbeiana*), and rats have been observed congregating around nesting waterbirds just prior to chicks hatching (Woodside 1997, pers. comm.). Oahu National Wildlife Refuge Complex (NWRC) staff have documented predation of waterbird chicks by the cattle egret and the black-crowned night heron (*Nycticorax nycticorax*). A bullfrog was documented preying upon a Hawaiian moorhen chick at the Refuge (Viernes 1995, 55:37). More recently, the "Key Predators" study of 2003 to 2004 on James Campbell NWR provided the first multiple observations of Hawaiian stilt chick predation by bullfrogs, which accounted for 45 percent of chick losses over the study period (Eijzenga 2005).

The most prevalent disease affecting Hawaiian waterbirds is avian botulism type C. Avian botulism is caused by a neurotoxin produced by a common bacterium (*Clostridium botulinum*). Normally unharmful and dormant, these spores release toxins only when certain conditions occur, including warm temperatures, high pH, low dissolved oxygen, and stagnant waters. Birds usually acquire the disease by eating invertebrates containing the toxin. Typical signs in birds include weakness, lethargy, and inability to hold up the head or to fly (Rocke and Friend 1999). Botulism can occur in any area with standing fresh or brackish water frequented by waterbirds.

Avian botulism outbreaks are common in Hawaii and are a significant cause of waterbird mortality (Pratt and Brisbin 2002, p. 36). One of the first outbreaks in Hawaii occurred on the island of Oahu at Kaelepulu pond, which is also known as Enchanted Lake, in Kailua in 1952. Since then, avian botulism outbreaks have been documented at Hanalei NWR on the island of Kauai, Aimakapa pond at Kaloko Honokohau National Historical Park on the island of Hawaii, Ohiapilo pond in Molokai, and at Kealia Pond NWR on the island of Maui (Pratt and Brisbin 2002, p. 36). At Hanalei NWR, over 300 sick or dead birds with suspected or confirmed avian botulism type C were found between December 2011 and April 2012. Of these, 82 percent were endangered species (55 percent Hawaiian duck, 19 percent Hawaiian coot, 4 percent Hawaiian moorhen, 4 percent Hawaiian stilt, and less than 1 percent Hawaiian goose) and 18 percent were native non-endangered, migratory, or feral/introduced birds. In February 2012 at the Lanai Sewage Treatment Plant, over 60 deaths were reported during an outbreak, mostly Hawaiian coot (USFWS unpublished data).

The possibility of West Nile virus or avian influenza reaching the Hawaiian Islands from the U.S. continent or Asia is a recent concern. The impact these two diseases may have on the Hawaiian waterbirds is not known at this time, but they could have deleterious impacts if they reach the Hawaiian Islands.

Environmental contaminants in wetlands are of concern to Hawaiian waterbirds because the general diet of these birds makes them susceptible to toxins accumulated in the food chain (Ratner 2000, p. 1-2). In 1988, a fuel spill in Pearl Harbor caused direct mortality and nest abandonment of Hawaiian waterbirds at the Honouliuli Unit of Pearl Harbor NWR (J. Leinecke 1993, pers. comm.). In 1996, an oil spill in Pearl Harbor imperiled the Hawaiian stilt as well as marine fisheries. Urban encroachment has the potential to negatively affect waterbirds' habitats via flushing of household and industrial products into water-collecting systems (storm drains and roadside ditches) which lead to streams, wetlands, and the ocean.

Preventing wetland loss, managing existing wetland habitat, and predator control at primary nesting sites are necessary actions to increase Hawaiian waterbird populations. As described in the Recovery Plan for Hawaiian Waterbirds, recovery of the Hawaiian waterbirds focuses on the following objectives: (1) increasing population numbers to a statewide baseline level; (2) establishing multiple, viable breeding populations throughout each species' historical range; and (3) establishing a network of wetlands on the main islands that are protected and managed for waterbirds (USFWS 2011).

Protection of a wetland implies that the wetland is secure from development. Management of a site implies adequate dedicated funding to implement science-based techniques to meet the life history requirements of endangered Hawaiian waterbirds. This includes a written management plan; adequate staffing, personnel with expertise in wetlands habitat management, secure water sources; managed water levels; control of invasive vegetation and fish; control of introduced predators; waterbird population monitoring; removal of mallard-Hawaiian duck hybrids; minimized human disturbance; and monitoring and control of avian diseases and environmental contaminants (USFWS 2011).

The recovery strategy for the Hawaiian waterbirds relies on a combination of protection and management of core and supporting wetlands to maintain self-sustaining breeding populations. Core wetlands are defined as areas that provide habitat essential for the larger populations of Hawaiian waterbirds that comprise the bulk of the numbers prescribed for recovery. It is crucial for wetlands in these sites to be secure from conversion to non-wetland condition and to have sufficient enduring management to recover Hawaii's waterbirds. Supporting wetlands are additional areas that may not support the bulk of waterbird populations but provide habitat important for smaller waterbird populations or that provide habitat needed seasonally by segments of the waterbird populations during part of their life cycle (USFWS 2011). In addition to the overall strategy for Hawaiian waterbirds, recovery of the Hawaiian moorhen also includes reestablishing populations on at least two additional islands (Maui, Molokai, Lanai, or Hawaii) (USFWS 2005, p. 74).

A variety of conservation measures have been implemented to protect Hawaii's endangered waterbirds. Efforts directly benefitting the Hawaiian waterbirds include a long-term hunting ban, protection of habitat through establishment and management of federal and State refuges and sanctuaries, and predator control. Conservation partnerships with private landowners protect and preserve core and supporting wetlands. Actions that inform conservation of the species include a biannual waterbird survey conducted by DOFAW since the mid-1950s, population monitoring, and research (USFWS 2011).

Hawaiian Coot

Taxonomy and Species Description
The Hawaiian coot was considered a subspecies of the American coot (*Fulica americana*), but is now considered a distinct species (USFWS 2011, p. 19). Adults have a black head, a slate gray body with white undertail feathers, and a prominent white frontal shield and bill; feet are lobed rather than webbed and are greenish-gray. No reliable measurements of total length or size are available; however, the Hawaiian coot is slightly smaller in body size than the American coot which averages 13 to 17 inches in total length and 15 to 30 ounces in mass (Pratt and Brisbin 2002, p. 34).

Historic and Current Distribution
The Hawaiian coot historically occurred on all of the main Hawaiian Islands except Lanai and Kahoolawe. Coots have typically been most numerous on the islands of Oahu, Maui, and Kauai (USFWS 2011, p. 19). Population estimates prior to the 1950s are not available; however, estimates from the late 1950s and early 1960s indicated a population of fewer than 1,000 birds. Hawaiian coots currently occur in coastal plain wetlands usually below 1,320 feet (400 meters) elevation on all the main Hawaiian Islands except for Kahoolawe; however, breeding is restricted to relatively few sites. Biannual waterbird counts conducted by DOFAW suggest that the statewide Hawaiian coot population averages approximately 2,000 birds with short-term population fluctuations and long-term slightly increasing population trend (USFWS 2011, p. 21-22). While not all wetlands are surveyed, the counts are considered a fairly accurate minimum population size. About 80 percent of the population detected in the surveys occur on the islands of Kauai (Hanalei, Huleia, Opaekaa), Oahu (coastal wetlands and reservoirs such as Lake Wilson and Nuuanu Reservoir, Kahuku Point and along the windward shore), and Maui (Kanaha and Kealia Ponds, Nuu Pond) (USFWS 2011). The remaining 20 percent of the population occurs in coastal ponds and playa wetlands, including breeding populations on the islands of Hawaii, Lanai, and Molokai.

Life History
Life history and breeding biology are poorly documented. Nesting habitat includes freshwater and brackish ponds, irrigation ditches, and taro fields. Floating nests are constructed of aquatic vegetation and found in open water or anchored to emergent vegetation. Open water nests are usually composed of mats of bulrush (*Schoenoplectus* spp.), water hyssop (*Bacopa monniere*) and Hilo grass (*Paspalum conjugatum*). Nests in emergent vegetation are typically platforms constructed from buoyant stems of species such as bulrush (*Schoenoplectus* spp.). Nesting occurs primarily from March through September, although some nesting occurs in all months of the year. The timing of nesting appears to correspond with seasonal weather conditions (USFWS 2011). Nest initiation is tied to rainfall as appropriate water levels are critical to nest success. Clutch size range from three to ten eggs, and precocial young hatch after a 25-day incubation period. There is no information on the lifespan and survivorship of this species; however, banding records indicate oldest American coot was at least 22 years old (USFWS 2011).

Habitat Description
The species is somewhat gregarious and uses freshwater and brackish wetlands, including agricultural areas (*e.g*., taro fields) and aquaculture ponds. Hawaiian coot generally occur in lowland (below 1,320 feet in elevation) wetland habitats with suitable emergent plant growth interspersed with open water, especially freshwater wetlands, but also freshwater reservoirs, cane field reservoirs, sewage treatment ponds, taro loi, brackish wetlands, and limited use of saltwater habitats. However, on the island of Kauai, some birds occur in plunge pools above 4,900 feet in elevation and on the island of Hawaii, stock ponds up to 6,600 feet in elevation. The species typically forages in water less than 12 inches deep, but will dive in water up to 48 inches deep. Compared to Hawaiian moorhens, Hawaiian coots prefer to forage in more open water. Logs, rafts of vegetation, narrow dikes, mud bars, and artificial island are utilized for resting. Ephemeral wetlands support large numbers during non-breeding season.

Hawaiian coots are generalists and feed on land, grazing on grass adjacent to wetlands, or in the water. They have been observed grazing from the surface of the water, or foraging by diving to obtain food resources. Food items include seeds and leaves, snails, crustaceans, insects, tadpoles, and small fish. The species will travel long distances, including between islands, when local food sources are depleted.

Some important habitats are located in National Wildlife Refuges and State sanctuaries and these sites receive management attention. However, other important habitats are not protected. These mostly include wetlands facing development or those used for agriculture or aquaculture. Examples include: playa lakes on the island of Niihau; Opaekaa marsh and Lumahai wetlands on the island of Kauai; Kahuku prawn farms, Laie wetlands, Ukoa, Punahoolapa, and Waihee marshes, Haleiwa and Waialua lotus fields, and Waipio wetlands on the island of Oahu; Paialoa and Ooia playa fishponds on the island of Molokai; and Opaeula, and Loko Waka ponds on the island of Hawaii (USFWS 2011, pp. 62-75).

Threats, Recovery Strategy, and Ongoing Conservation Measures
The Hawaiian coot was listed as an endangered species on October 13, 1970 (USFWS 1970), pursuant to the Endangered Species Preservation Act of 1966. The original recovery plan was approved in 1978, and revised in 1985. The first draft of the second revision was released on May 1999, followed by the second draft of the second revision in May 2005. A species review has not yet been initiated pursuant to Section 4(c)(2) of the ESA which requires five-year review after listing. Critical habitat has not been designated for the Hawaiian coot (USFWS 2011).

The threats to, and conservation needs of, Hawaiian waterbirds outlined above in the “Status of the Species” section for the Hawaiian moorhen apply to the Hawaiian coot.

A variety of conservation measures have been implemented to protect Hawaii’s endangered waterbirds. Efforts directly benefitting the Hawaiian coot include a long-term hunting ban, protection of habitat through establishment and management of Federal and State refuges and sanctuaries, and predator control. Actions that inform conservation of the species include a biannual waterbird survey conducted by DOFAW since the mid-1950s, population monitoring, and research.

Hawaiian Duck

Taxonomy and Species Description
The Hawaiian duck is one of two extant endemic duck species (Family: Anatidae) found in Hawaii from at least 13 species of endemic Hawaiian waterfowl known from the fossil record, including extinct giant flightless ducks (Olson and James 1991, Burney et al. 2001), descendants of migratory ducks that evolved here in the islands over hundreds of thousands to millions of years and became unique Hawaiian species (Rhymer 2001). The Hawaiian duck is closely related to but genetically and morphologically distinct from the mallard (*A. platyrhynchos*) (Fowler et al. 2008). Both sexes of the Hawaiian duck are mottled brown and may resemble a small female mallard.

Adult males have darker heads, with distinctive brown chevrons on the breast, flank and back feathers, and olive-colored bills (Engilis et al. 2002). Adult females are similar but are smaller than males on average and slightly lighter in color, with plainer, buff colored chin and back feathers.

Historic and Current Distribution
In the early 1900s, Hawaiian ducks were common in the coastal marshes of all the main Hawaiian Islands except for Lanai and Kahoolawe (Munro 1944). By the mid-1900s, the species had been reduced to 500 birds on the island of Kauai and a few isolated pairs on other islands (Schwartz and Schwartz 1953). In the mid-1950s, the State of Hawaii began a captive propagation and release program for the Hawaiian duck. From 1958-1990, 757 captive-bred Hawaiian ducks were released on the islands of Oahu (326), Maui (12), and Hawaii (419) to re-establish the species within its former range (Giffin 1983). The Hawaiian duck release program was complicated by the problem of interbreeding with feral mallards (ornamental or farm ducks that escaped or were released into the wild). Recent genetic sampling indicates the Kauai population to be predominantly true Hawaiian ducks, and Oahu and Maui populations to be predominantly mallards and mallard-Hawaiian duck hybrids, elevating the importance of Kauai in persistence of the species (Fowler et al. 2009).

Although the Hawaiian duck population is estimated to be about 2,200 individuals, with 2,000 true Hawaiian duck on the islands of Kauai and Niihau and 200 on parts of the island of Hawaii; this was based on State biannual count data which do not include remote wetlands and streams (Engilis et al. 2002, p. 11) where an estimated 50-80 percent of Hawaiian duck are believed to reside on the island of Kauai (Schwartz and Schwartz 1953, Swedberg 1967). State biannual counts may provide an index for wetlands, and long-term trends suggest Hawaiian duck are increasing on the island of Kauai but decreasing on other islands due to hybridization with feral mallards (USFWS 2011).

However, count data have peaked at 524 for the all-island survey and 459 for Kauai in January 2004 (DOFAW unpublished data 1986-2006), and recent banding activities over a 13 month period at the Hanalei NWR have resulted in 675 Hawaiian ducks banded, and resighting activities indicate that >75 percent of birds on the Refuge are not currently banded (C. Malachowski unpublished data). Together, these data indicate the State count data is biased seriously low. Furthermore, counts on Oahu, Maui, and Hawaii Island are confounded by the

difficulty in distinguishing Hawaiian ducks from mallards and hybrids in the field. There is currently no credible population estimate for Hawaiian ducks at any scale.

Life History

The Hawaiian duck is one of the least studied of the Hawaiian birds. Its breeding ecology is largely unknown. Although some pairs nest in lowland habitats on the island of Kauai, Hawaiian ducks have also been observed nesting along stream banks and in the upper Alakai swamp (USFWS 2011). Nesting occurs year round, but most activity occurs between March-July on Hawaii Island (Giffin 1983) and December-May on the island of Kauai (Swedberg 1967). The Hawaiian duck usually nest on the ground in herbaceous and/or woody vegetation in wetland-associated uplands. Generally six to ten eggs are laid, precocial ducklings hatch after 26-30 days of incubation, and ducklings attain flight after 65-70 days of protection and rearing usually by the lone female (Swedberg 1967, Giffin 1983).

Habitat Description

Hawaiian ducks are found from sea level to 9,900 feet elevation. The Hawaiian duck occurs in a wide variety of natural and artificial wetland habitats including freshwater marshes, flooded grasslands, montane stock ponds, streams, forest swamplands, taro loi, lotus (*Nelumbo nucifera*) farms, irrigation ditches, reservoirs, and mouths of larger streams (USFWS 2011). Since 2006-2007, significant wetland habitat improvements have been made for Hawaiian ducks at Hanalei and Huleia NWRs on the island of Kauai with the intent of providing optimal foraging, loafing, and breeding habitat. Watershed protection and management is beneficial to the Hawaiian duck because of the species' elevational range and use of wetland habitats from the coastal plain to mountain top.

Hawaiian ducks move between feeding and breeding habitats, and are known to fly between the islands of Kauai and Niihau. The species typically forages in water less than six inches deep. Hawaiian ducks are opportunistic and their diet includes snails, aquatic insects, earthworms, grass seeds, green algae, and seeds and leaves of wetland plants. The Hawaiian duckling diet has never been studied. However, mallard ducklings eat mainly animal foods for the first 25 days of life (aquatic insects especially chironomids, small crustaceans, and mollusks) spending 65-80 percent of daylight feeding. After 20-30 days, seeds become more prominent in the mallard duckling diet (Drilling et al. 2002). Hawaiian ducks are usually found alone or in pairs and are wary, especially when nesting or molting, although during the winter they may gather in larger numbers to exploit abundant food resources (USFWS 2011).

Threats, Recovery Strategies, and Ongoing Conservation Measures

The Hawaiian duck was listed as an endangered species in 1967 (USFWS 1970), pursuant to the Endangered Species Preservation Act of 1966. The original recovery plan was approved in 1978 and revised in 1985. The first draft of the second revision was released on May 1999, followed by the second draft of the second revision in May 2005. A species review has not yet been initiated pursuant to section 4(c)(2) of the ESA which requires five-year review after listing (USFWS 2011). Critical habitat has not been designated for the Hawaiian duck (USFWS 2011).

The threats to, and conservation needs of, Hawaiian waterbirds outlined above in the "Status of the Species" section for the Hawaiian moorhen apply to the Hawaiian duck.

However, the greatest current threat to the Hawaiian duck is hybridization with non-native mallards introduced to Hawaii for farming, sport hunting, and pond beautification (USFWS 2011, Uyehara et al. 2007). This is especially problematic on the islands of Oahu and Maui where most of the individuals are mallard-Hawaiian duck hybrids. In addition to the overall conservation needs outlined below, recovery of the Hawaiian duck includes removing the threat of hybridization with feral mallards on the islands of Kauai, Niihau, Oahu, and Hawaii; and reestablishing Hawaiian duck populations on the islands of Maui and Molokai (USFWS 2011). It is likely that feral pigs and goats (*Capra hircus*) significantly reduce the suitability of nesting habitat for Hawaiian ducks along montane streams.

A variety of conservation measures have been implemented to protect Hawaii's endangered waterbirds. Efforts directly benefitting the Hawaiian duck include a long-term hunting ban, protection of habitat through establishment and management of federal and State refuges and sanctuaries, predator control, release of captive-bred Hawaiian ducks, and restrictions on importation of mallards. Additional conservation actions include public service announcements and an outreach and communications plan to raise public awareness about the hybridization issue facing the Hawaiian duck. Actions that inform conservation of the species includes population monitoring, refinement of a field key to distinguish Hawaiian ducks from mallard-Hawaiian duck hybrids (Fowler et al. 2009), and research on movements and habitat use (USFWS 2011).

Hawaiian Stilt

Taxonomy and Species Description

The Hawaiian stilt is part of a superspecies complex of stilts (Family: Himantopus), and is considered a distinct subspecies of the black-necked stilt (*Himantopus mexicanus*) (USFWS 2011, p. 45). Hawaiian stilts are slender wading birds, black above (except for the forehead), white below, and with distinctive long, pink legs. Sexes are distinguished by the color of the back feathers (brownish female, black male) as well as by voice, which is lower in females. Downy chicks are well camouflaged, tan with black speckling. Immature birds have a brownish back and white patches on their cheeks (Hawaii Audubon Society 2005, p. 49). The total length of adult Hawaiian stilt is about 16 inches with the mass of males and females averaging 199 ± 13.8 grams (n=42) and 206.2 ± 21.7 g (n=43), respectively (Robinson et al. 1999, p. 16).

Historic and Current Distribution

Hawaiian stilt were historically known from all of the major Hawaiian Islands, except Lanai and Kahoolawe (USFWS 2011, p. 46). Hawaiian stilt are now found on all of the main Hawaiian Islands except Kahoolawe. No historical estimate of Hawaiian stilt population size is available, but by the early 1940s, the statewide population was estimated to be between 200 and 1,000 birds (USFWS 2011, p. 46). However, these population estimates did not account for the Hawaiian stilt present on Niihau and are therefore considered underestimates. DOFAW has conducted biannual waterbird surveys since the 1950s. Though Hawaiian stilt census data show high year-to-year variability in the number of stilts observed (USFWS 2011, p. 47), long-term census data indicate that statewide populations have been relatively stable or slightly increasing. Currently, this trend has continued and the statewide Hawaiian stilt population is considered to be stable to increasing with an average of approximately 1,500 birds over the 10 year period of

1998 to 2007 (USFWS 2011, p. 47). Because Hawaiian stilts readily disperse between islands they are considered a homogenous meta-population (USFWS 2011, p. 50).

Life History
Hawaiian stilts prefer to nest on freshly exposed mudflats interspersed with low growing vegetation (USFWS 2011, p. 57). Nesting has also been documented on low relief islands (natural and man-made) in fresh or brackish ponds, man-made floating nest structures, floating wooden platforms, and cleared level areas near foraging habitats. The nest itself is a simple scrape on the ground. They have also been observed using grass stems and rocks for nesting material (Coleman 1981). Hawaiian stilts are territorial with average inter-nest distances varying from 53 to 262 feet and are semi-colonial (USFWS 2011, p. 57).

The nesting season normally extends from mid-February through August (Robinson et al. 1999). Peak nesting varies among years and re-nesting can occur after loss of a clutch (Robinson et al. 1999). Hawaiian stilt usually lay three to four eggs that are incubated for approximately 24 days (Coleman 1981; Chang 1990). Chicks are precocial, leaving the nest within 24 hours of hatching. Adults with three-day old chicks have been observed to move 0.3 of a mile from the nest site (Reed and Oring 1993). Young may remain with both parents for several months after hatching (Coleman 1981). Little is known about the lifespan or survivorship of the species, however, several banded wild Hawaiian stilts survived 15 to 17 years (USFWS 2011, p. 59).

Habitat Description
Hawaiian stilts use a variety of aquatic habitats but are limited by water depth and vegetation cover. Hawaiian stilts are known to use ephemeral lakes, anchaline ponds, prawn farm ponds, marshlands and tidal flats. Foraging habitat for Hawaiian stilt is early successional marshland or other aquatic habitat with a water depth less than 9 inches and perennial vegetation that is limited and low-growing. Native low-growing wetland plants associated with stilt nesting areas include water hyssop (*Bacopa monnieri*), sea purslane (*Sesuvium portulacastrum*), and the sedges makaloa (*Cyperus laevigatus*) and kaluha (*Bolboschoenus maritimus*). They use taro (*Colocasia esculenta*) ponds in the early stages of planting and do not frequent closed canopy taro patches (USFWS 2011, p. 59).

Hawaiian stilt are opportunistic feeders. They eat a wide variety of invertebrates and other aquatic organisms available in shallow water and mudflats. Specific organisms taken include water boatmen (Corixidae), beetles (Coleoptera), possibly brine fly (*Ephydra riparia*) larvae, polychaete worms, small crabs, Mozambique tilapia (*Tilapia mossambica*), western mosquito fish (*Gambusia affinis*), and tadpoles (*Bufo* spp.) (USFWS 2011, p. 59). Ephemeral ponds provide an immediate and short term food supply with the emergence of invertebrates (USFWS 2011, p. 60).

Threats, Recovery Strategy, and Ongoing Conservation Measures
The Hawaiian stilt was listed as an endangered species on October 13, 1970 (USFWS 1970), pursuant to the Endangered Species Preservation Act of 1966. The original recovery plan was approved in 1978, and revised in 1985. The first draft of the second revision was released on May 1999, followed by the second draft of the second revision in May 2005. A species review has not yet been initiated pursuant to Section 4(c)(2) of the ESA which requires a five-year

review after listing. Critical habitat has not been designated for the Hawaiian stilt (USFWS 2011).

The threats to, and conservation needs of, Hawaiian waterbirds outlined above in the "Status of the Species" section for the Hawaiian moorhen apply to the Hawaiian stilt.

A variety of conservation measures have been implemented to protect Hawaii's endangered waterbirds. Efforts directly benefitting the Hawaiian stilt include a long-term hunting ban, protection of habitat through establishment and management of Federal and State refuges and sanctuaries, and predator control. Actions that inform conservation of the species include a biannual waterbird survey conducted by DOFAW since the mid-1950s, population monitoring, and research.

ENVIRONMENTAL BASELINE

The environmental baseline describes the status of the species and factors affecting the environment of the species or critical habitat in the proposed action area during the consultation process. The baseline usually includes State, local, and private actions that affect a species at the time the consultation begins. Unrelated Federal actions that have already undergone formal or informal consultation are also a part of the environmental baseline. Federal actions within the action area that may benefit listed species or critical habitat are also included in the environmental baseline. The environmental baseline describes the species' health at a specified point in time, and it does not include the effects of the action under review in this consultation.

The action area of a project is defined by regulation as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). As indicated in the Project Description, the action area for this project includes the facilities, sites, and all related infrastructure at Barking Sands, the Mana Plain (specifically, the area of the plain surrounding Barking Sands), Makaha Ridge, Kokee, Kamokala Ridge, Port Allen, and Miolii Ridge. In addition, the action area includes seabird conservation site(s) along the Na Pali Coast.

Newell's Shearwater, Hawaiian Petrel, and Band-rumped Storm petrel

An estimated 90 percent of the Newell's shearwater population is thought to nest on the island of Kauai (18,900 individuals). Adult Newell's shearwaters do not nest at PMRF sites, but do use the area to transit between their ocean foraging areas and their high elevation, montane nesting sites. While the PMRF sites at Makaha Ridge and Kokee occur at elevations similar to that of nesting colonies, the species do not breed at these sites (Department of the Navy 2014, KESRP unpublished data). Fledgling Newell's shearwaters also fly through the PMRF sites on their first trip to the sea. As described above, fledgling Newell's shearwaters are attracted to brightly lit areas and become disoriented by them.

At Barking Sands, over the recent seven year period of 2007 to 2013, a total of 34 Newell's shearwaters were recovered (SOS Database, Department of the Navy 2014). Six of the downed

Newell's shearwaters resulted in mortality. The other 25 birds were captured and subsequently turned in to the SOS program (SOS Database). A total of five Newell's shearwaters and one band-rumped storm petrel were downed at Barking Sands from 2011 to 2013, the period following exterior lighting modifications such as realignment, replacement with full cut-off fixtures, and operational changes (SOS Database, Department of the Navy 2014). In regards to observations of seabird fallout at locations other than Barking Sands, only one Newell's shearwater was recovered near PMRF facilities at Port Allen; however, the bird was recovered on the State-operated side of the pier near a light. There have been no observations of seabird disorientation or fallout at Makaha Ridge, Kokee, and Kamokala sites where there are lower wattage lamps and daily presence of Navy personnel.

Spear et al. (1995) estimated from at-sea densities that the world population of Hawaiian petrels was 19,000 with at least 1,600 pairs nesting on the island of Kauai (Ainley et al. 1997a, p. 28). Adult Hawaiian petrels do not nest at PMRF sites, and their use of the Barking Sands area is likely less than that of Newell's shearwaters because most Hawaiian petrels are thought to nest in the northwest region of the island of Kauai. A small number of fledgling Hawaiian petrels might also fly through the area on their first trip to the sea. Prior to 2000, 11 Hawaiian petrels were recovered at Barking Sands, but none have been discovered since that time (SOS Database). Hawaiian petrels constitute less than 0.9 percent of birds recovered by the SOS program since 1979 and those recovered on PMRF comprise three percent of the total number of Hawaiian petrels recovered by SOS to date (SOS Database). Since 2007, no Hawaiian petrel fallout has been observed at Barking Sands.

Evidence of extant nesting populations of band-rumped storm-petrels in the Hawaiian Islands is based on auditory detection of adult birds during breeding season surveys and by retrieval of fledglings in the fall. Fledglings have been retrieved on the island of Kauai, providing additional evidence of nesting colonies within the Hawaiian archipelago (Harrison *et al*. 1990). Kauai likely has the largest population of band-rumped storm-petrels in the Hawaiian Islands (Harrison *et al*. 1990). Wood *et al*. (2002) estimated there were 171-221 nesting pairs on the island of Kauai. As with the Newell's shearwater and Hawaiian petrel, the band-rumped storm-petrel is susceptible to light attraction and collision with objects such as guyed towers and antennas. Since 2007 two band-rumped storm petrels were recovered and subsequently turned in to the SOS program; one in 2008 and one in 2011 (Department of the Navy 2014).

Surveys using ornithological radar have not been conducted specifically at PMRF, but surveys were conducted in 2008 at Kekaha (approximately five miles south of PMRF Main Base) and detected an average of 21.2 seabird targets per hour (KESRP 2008). Species cannot be identified using this technique, so the proportion of each of the three species observed in the vicinity of PMRF is unknown.

As stated above, predation by nonnative predators such as feral cats, barn owls, and rats has been regularly observed, even in the most remote areas of the island of Kauai, including the Na Pali Coast. Recent population models have estimated that Newell's shearwaters in this region could be declining at a rate of at least 9.4% per year (Griesemer and Holmes 2011), and similar rates of decline have been estimated for Hawaiian petrels breeding in colonies absent of predator control (Griesemer 2013, Simons 1984).

Honopu Valley and Makaha Ridge are located in an area of the Na Pali coast with high traffic rates of listed seabirds. The proposed seabird conservation site at Honopu Valley holds large concentrations of nesting Newell's shearwater and band-rumped storm petrels (Figure 5). The colony is recognized by KESRP as a high priority endangered seabird colony (Banfield et al. 2013), and the site could represent an important refuge for these species in the future. Makaha Ridge occurs nearby Nualolo Aina and Nualolo Kai seabird colonies, where barn owls have been observed targeting Newell's shearwater and band-rumped storm petrels (Wood et al. 2002, Banfield et al. 2013). It is likely that barn owls are also impacting Hawaiian petrels in this area of the Na Pali Coast, since Hawaiian petrels regularly transit over these sites.

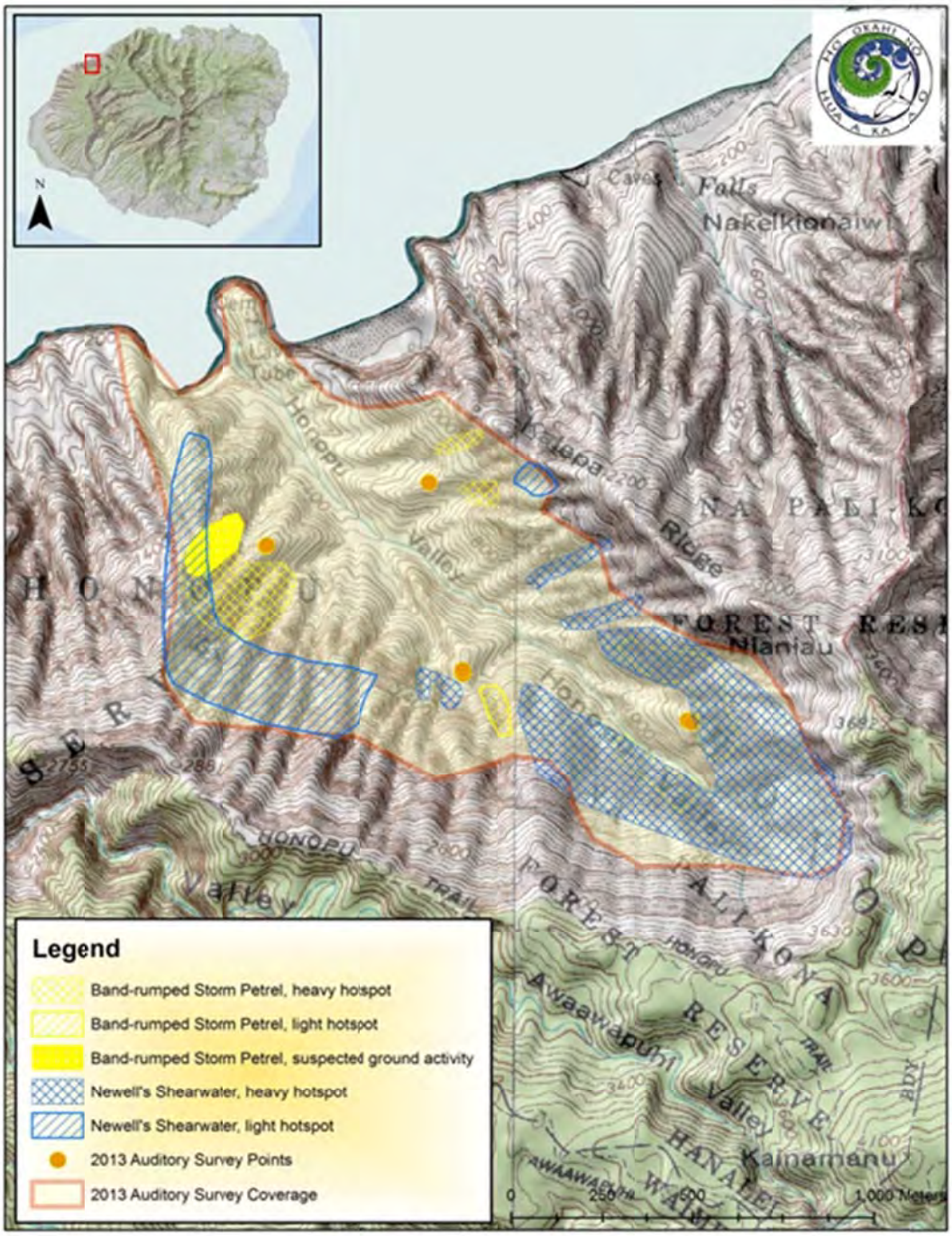

Figure 5. KESRP auditory survey coverage and seabird distribution in Honopu Valley in 2013 from Banfield et al. 2013. *Hotspot light* defined by KESRP as localised aerial activity – sporadic calling and/or aerial activity. *Hotspot heavy* defined by KESRP as localised aerial activity – continuous calling and/or aerial activity.

Previous Consultations in the Project Area
In a biological opinion in March 2011 and amendment in October 2011, the Service issued a non-jeopardy biological opinion for the Pacific Missile Range Facility Intercept Test Support (Service File 2010-F-0430 and 2010-F-0460), which addressed the effects from the Aegis Ashore Intercept Test Support construction and operations activities at Barking Sands on the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel, for a period of three years through the completion of these biological and conference opinions. The biological opinion amendment authorized the take of up to ten Newell's shearwaters, one Hawaiian petrel, and one band-rumped storm-petrel over the permit term as a result of collision with the boresight towers or due to attraction and fallout from lighting associated with the project. Also, the biological opinion amendment authorized the take of up to five Newell's shearwaters eggs and/or chicks, one Hawaiian petrel eggs and/or chicks, and one band-rumped storm-petrel egg and/or chick over the permit term as a result of the injury or mortality of breeding adults. Because of the minimization and mitigation measures implemented through the biological opinion, anticipated reduction in ongoing take from these measures, and implementation of conservation measures to offset unavoidable take (i.e. predator control within existing seabird breeding colonies and radar surveys to help assess population trends on the island of Kauai), the Service concluded that the issuance of the incidental take permit was not likely to jeopardize survival and recovery in the wild of the Newell's shearwater, Hawaiian petrel, or band-rumped storm petrel.

In April 2011, the Service issued a non-jeopardy biological opinion for the Kauai Island Utility Cooperative Short-term Seabird Habitat Conservation Plan and Incidental Take Permit (Service File 2011-F-0113, Permit No. TE234201-0), that addressed effects from the operation of existing and new electrical utility facilities on the Newell's shearwater and Hawaiian petrel, until 2016 for the entire island of Kauai. The biological opinion authorized the take of up to 162 adult, sub-adult, or fledgling Newell's shearwaters annually over the permit term as a result of attraction to, or collision with, KIUC facilities, as well as the take of up to 18 eggs and/or chicks as a result of the mortality of breeding adults. The annual take of up to two adult, sub-adult, or fledgling Hawaiian petrels was also authorized. Because of the minimization and mitigation measures implemented through the HCP, anticipated reduction in ongoing take from these measures, and implementation of conservation projects to offset unavoidable take (i.e. predator control within existing seabird breeding colonies), the Service concluded that the issuance of the incidental take permit was not likely to jeopardize survival and recovery in the wild of the Newell's shearwater or Hawaiian petrel.

In October 2011, the Service issued a non-jeopardy biological opinion for the Pacific Missile Range Facility Advanced Hypersonic Weapons System (Service File 2011-F-0385), that addressed the effects from one-time operation of existing launch facilities, Kauai Test Facility, on the Newell's shearwater and Hawaiian petrel through mid-November 2011. The biological opinion amendment authorized the take of up to four Newell's shearwaters and one Hawaiian petrel over the permit term due to attraction and fallout from lighting associated with the project. Because of the minimization and mitigation measures implemented through the biological opinion, anticipated reduction in ongoing take from these measures, and implementation of conservation projects to offset unavoidable take, the Service concluded that the issuance of the incidental take permit was not likely to jeopardize survival and recovery in the wild of the Newell's shearwater or Hawaiian petrel.

In September 2013, the Service received acoustic monitoring data from KIUC, providing evidence of a higher than anticipated number of seabird collisions with utility facilities. As a result of this information the Service notified KIUC of their likely exceedance of their authorized take level of Newell's Shearwater (Service File 2013-TA-0456). The Service is currently working with KIUC to identify and implement immediate minimization and mitigation actions.

Hawaiian Hoary Bat

As stated above, our understanding of Hawaiian hoary bat distribution and abundance is limited. However, the distribution may be broader than indicated by the limited information resulting from the localized monitoring efforts.

Observations of Hawaiian hoary bats have occurred at Barking Sands at the oxidation pond in the southern area of the base and over open ocean near the Nohili Ditch outfall. In 2000, a group of four bats was observed at the oxidation pond, and five bats were seen foraging near the Nohili Ditch outfall (Commander Navy Region Hawaii 2010).

In 2010 and 2011, the Navy contracted U.S. Geological Survey (USGS) Pacific Island Ecosystem Research Center biologists to survey for bat occurrence at Barking Sands, Kamokala Magazines, Makaha Ridge, and Kokee sites. Sampling was conducted during 486 station-nights at 12 point-location stations at these sites using Anabat II Bat Detectors and SM2 Song Meter Digital Field Recorder Platforms. At Barking Sands, seven stations were sampled in an area spanning south of KTF to the oxidation pond. Two stations were sampled at Makaha Ridge, two at Kokee, and one at Kamokala Magazines (U.S. Geological Survey 2011).

Monitoring results showed bat occurrence at all four PMRF sites. At Barking Sands, bat detectability was greater than 0.75 between September and December. Detectability and call activity was highest during that period and dropped between February and May. Detection data between September and December indicated that Barking Sands may be used by adult bats for "fall swarming" in preparation for mating. Detectability and call activity were much lower at Kamokala Ridge, with no evidence of fall swarming activity, and followed the same seasonal pattern (U.S. Geological Survey 2011).

At Makaha Ridge and Kokee sites, the seasonal pattern was different than Barking Sands and Kamokala. Detectability and call activity were highest between March and April, and bat detectability was 1.0 during this period. Overall, detectability and bat call activity remained relatively consistent year round with a higher rate at Barking Sands (U.S. Geological Survey 2011).

Hawaiian Goose

Since their reintroduction to the island of Kauai, Hawaiian geese have been infrequent visitors on Mana Plain and at Barking Sands. However, over the past three years, numbers of Hawaiian geese at Barking Sands have increased, likely in conjunction with an effort by the State of Hawaii to translocate geese to Kokee State Park on the west side of the island, upland of Barking

Sands (Commander Navy Region Hawaii 2010). After translocation to Kokee, Hawaiian geese have been observed flying down into lower elevation habitats on Mana Plain and PMRF. In July 2012, as many as 32 Hawaiian geese were observed at one time at the PMRF airfield. Hawaiian geese are also attracted to the adjacent Kinikini Ditch and State-managed Kawaiele Waterbird Sanctuary that occur just east of the base. In July 2012, a record high of 91 Hawaiian geese were observed near Kawaiele Wetlands, within sight of the PMRF runway.

Despite USDA-WS efforts to haze Hawaiian geese from areas near the airfield at PMRF, in December 2009, a pair initiated a nest near the HIANG administration building. In a biological opinion issued on 24 December 2009 (Service File 2010-F-0096), the Navy consulted with the Service pursuant to section 7 of the ESA to translocate the Hawaiian goose family group from PMRF Main Base to Kilauea National Wildlife Refuge on the north shore of Kauai. The translocation was conducted by Hawaii DLNR DOFAW personnel under the existing 6(c), (16 U.S.C. 1535(c)) agreement with the Service.

In addition, another nest was initiated in January 2011, also within the HIANG complex fence; this nest failed during the incubation period. Two Hawaiian goose nests were laid during the 2011-2012 breeding season (both in December 2011), one within the HIANG complex fence and one within the fenced area of the sewage oxidation ponds in the southern portion of Barking Sands. At least one male goose (identified via field-readable numbered leg band) successfully nested at PMRF during both the 2009-2010 and 2011-2012 breeding seasons. Three nests occurred in the 2012 – 2013 breeding season with one pair nesting at HIANG and two nests at the oxidation pond. The same number of nests occurred in 2013-2014 season; one at the beach cottages (this pair formerly nested at HIANG) and two nests at the oxidation pond (one in same location as 2012 and one new nest).

The Navy conducts a variety of ongoing conservation actions designed to benefit Hawaiian geese at Barking Sands. To reduce human interactions with Hawaiian geese PMRF implements a public education campaign informing base residents and visitors about appropriate behavior around Hawaiian geese. Educational signs illustrate the dangers of feeding, touching or otherwise harassing Hawaiian geese. In addition, PMRF has installed signs along roadways where Hawaiian geese are known to occur in an effort to reduce the potential for car collisions.

The Navy also implements a year-round predator control program at Barking Sands, including control of feral cats, barn owls, and other non-native predators. The removal of these invasive predators provides benefits to Hawaiian geese, resulting in a safe location to loaf, forage, molt, and breed. Barking Sands represents the only site on Mana Plain that has predator control.

Hawaiian geese occur at both Kokee and Makaha Ridge sites, however, no hazing of geese are conducted at these sites. At the PMRF Kokee sites, Hawaiian geese may fly over or forage at the installation. Some of the Hawaiian geese that were released at Kokee State Park have moved to upland areas of managed grass. One Hawaiian goose was observed flying over the PMRF Kokee site in 2006. Additionally a delivery vehicle struck one Hawaiian goose at the Kokee site in 2011. At Makaha Ridge, six Hawaiian geese are regularly observed at or near PMRF facilities (Commander Navy Region 2010).

Previous Consultations in the Project Area
In September 2012, the Service issued a non-jeopardy biological opinion for Pacific Missile Range Facility, Bird Aircraft Strike Hazard Program (Service File 2012-F-0409), that addressed effects from increased hazing of the Hawaiian goose, until conclusion of these biological and conference opinions. The biological opinion for increased hazing of the Hawaiian Goose authorized the take of up to 20 adult Hawaiian geese and one Hawaiian goose of any age as a result of harassment, and up to 50 eggs or goslings as a result of nest failure, abandonment, or reduced fledgling success from harassment of adults. Because the conservation measures implemented through the term of the biological opinion including public education, habitat alteration, and predator control were anticipated to avoid, minimize, and offset adverse impacts to Hawaiian geese, the Service concluded that the issuance of the incidental take permit was not likely to jeopardize survival and recovery in the wild of the Hawaiian goose.

Hawaiian Waterbirds

Hawaiian moorhen, Hawaiian coot, Hawaiian duck, and Hawaiian stilt regularly utilize wetland areas adjacent to PMRF including Kawaiele Waterbird Sanctuary and Mana Plains Forest Reserve as well as degraded aquatic habitat. These species frequent PMRF and are commonly observed in the agricultural drainage ditches and sewage oxidation pond in the southern section of the base. In March 2012, as many as 18 Hawaiian stilts and 14 Hawaiian coots were observed at the oxidation pond. Hawaiian moorhen and Hawaiian duck occur almost exclusively in the agricultural ditches. None of the Hawaiian waterbirds have been observed nesting at PMRF, including areas adjacent to the oxidation pond.

A variety of conservation actions are conducted by the Navy at Barking Sands that will benefit Hawaiian waterbirds. Education signs were installed along roadways indicating vehicles should slow in an effort to reduce potential for vehicle collisions with waterbirds. A year round predator control program has been implemented to control feral cats, rats, barn-owls, and other non-native predators. The control of predators provides waterbirds a safe location to loaf, forage, molt, and breed. On the Mana Plain, Barking Sands is the only area with an active program to control waterbird predators.

EFFECTS OF THE ACTION

Newell's Shearwater, Hawaiian Petrel, and Band-rumped Storm Petrel

As noted above, listed seabirds are negatively affected by increasing urbanization and the accompanying artificial lights, particularly for fledglings during their first flight to the ocean from their nesting grounds. When attracted to manmade lights, fledglings become confused and may suffer temporary night blindness. They often fly into utility wires, poles, trees, and buildings and fall to the ground. Other significant anthropogenic sources of mortality include collision with communications towers, power transmission lines and poles, fences, and other structures (Simons and Hodges 1998, pp. 18-19).

Collision with narrow-profile structures such as transmission lines and towers is well-documented for Hawaii's listed seabirds, particularly on the island of Kauai. Listed seabirds are nocturnal and fly over 30 miles per hour, making it difficult for them to detect and avoid wires and antennas (Cooper and Day 2003, p. 64). Recent surveys using vertical radar to estimate flight altitude show site-specific variation in altitude, and calibration between human-made visual observations and automated vertical radar detections of birds indicates large discrepancies in flight altitude estimation (David, pers. comm. 2008). Likewise, Day and Cooper (2004, p. 3) have stated there is considerable among-site variation in flight altitudes.

This section addresses the potential effects to listed seabirds from light attraction, collisions with communication towers and electrical distribution lines and poles, and conservation measures associated with the proposed action.

PMRF Lighting

The Navy has been implementing an array of lighting practices to minimize risk of seabird light attraction to all PMRF facilities. Although the lights in several key areas at Barking Sands are turned off (the most effective practice to avoid attraction of seabirds to facilities), many of the facilities at PMRF require lighting for safety or operations. Lights that cannot be turned off due to safety and/or operational purposes have been shielded, realigned, or replaced with full cutoff fixtures. Such modifications to lighting may reduce impacts to listed seabirds by approximately 40 percent (Reed *et al*. 1985, p. 380), but does not completely eliminate the threat. Anti-Terrorism/Force Protection lights at all six launch pads and three missile assembly areas were fitted with green bulbs; however, the efficacy of this practice is currently being tested.

The Service anticipates that the proposed project will result in a minimal amount of seabird attraction to artificial night lighting, particularly from the operational use of Anti-Terrorism/Force Protection lighting associated with the launch areas. The number of nights during the three-month nocturnal seabird fledging period that Force Protection lighting at launch pads will be turned on is not likely to exceed a total of 30 nights. And, the lighting at each launch location during the period from 2011 to 2013, which included the implementation of the full suite of take avoidance and minimization measures, is presumed to be representative of the lighting conditions at launch pads at PMRF in the foreseeable future.

Based on the number of listed seabirds recovered at PMRF by SOS during the period of 2011-2013, the Service estimates up to three fledgling Newell's shearwaters per year, one Hawaiian petrel every 10 years, and two band-rumped storm petrels every 10 years may be taken by the proposed project due to attraction to artificial lights. Downed birds that are recovered and placed in SOS aid stations will be collected by SOS personnel for rehabilitation and/or release, and if they cannot be salvaged, the birds will be euthanized. To date, the number of birds processed through the SOS program that survive and return to breed is unknown.

PMRF Communication Towers and Electrical Distribution Lines

The Service provided the Navy with a search protocol for conducting carcass searches to estimate the number of avian fatalities attributable to communication towers at PMRF. Surveys were conducted to assess the threat to listed seabirds of collision with the communication towers

sites at PMRF. During 2008, from October to December, searches for birds were performed every three to four days under each communication tower at Barking Sands, and a search efficiency trial was conducted to assess the potential for searchers to miss carcasses or downed birds during searches, following the Service's protocols. In 2010, in addition to the 14 towers at Barking Sands, the surveys were expanded to the two towers at Makaha Ridge and two towers at Kokee sites. The search protocols from 2008 were repeated and a scavenger trail was conducted to estimate the carcasses or downed birds that may have been missed in 2008 due to removal of birds by scavengers (e.g. cats). While carcasses and feather spots of zebra doves (*Geopelia striata*) have been found in surveys, to date no mortality of listed seabirds due to collision with communication towers at PMRF has been observed.

In addition to communication towers, the facilities at Barking Sands include approximately 7 miles of 12 kV electrical distribution lines and poles. Line heights are at or below vegetation levels have been shown to significantly reduce the potential for seabird collisions with powerlines (Ainley et al. 1995, KESRP unpublished data). No downed birds recovered by SOS have been associated with the electrical distribution structures at PMRF (SOS Database), and vegetation at PMRF is within the range of height of distribution lines. Therefore, the Service anticipates that the vegetation will likely shield seabirds from collision with electrical distribution facilities on the installation.

Although no mortalities of listed seabirds have been observed at communication towers or distribution lines at PMRF, the Navy will continue to conduct tower monitoring, scavenger trials, and searcher efficiency trials at PMRF to assess rates of listed seabird collision in conjunction with Five-year INRMP Updates. Additionally, the Navy will develop search protocols to monitor for seabirds under electrical distribution lines.

Beneficial Effects of Conservation Measures

The implementation of lighting practices to minimize seabird attraction by the Navy at PMRF will likely reduce the attraction of listed seabirds. In 2010, prior to full implementation of all lighting practices mentioned in the paragraph above, a total of 12 Newell's shearwater were recovered at PMRF (SOS Database, Department of the Navy 2014). Following the implementation of these take avoidance and minimization practices from 2011 to 2013, a total of only five Newell's shearwaters and one band-rumped storm petrel were downed at Barking Sands. Further assessment is required to assess whether the green lighting techniques are successful in reducing listed seabird attraction and fallout on PMRF; however, the lighting practices that are most effective in reducing seabird fallout will continue to be implemented annually during the seabird fledging period (Department of the Navy 2014).

Predator control at Barking Sands sites will benefit listed seabirds that are downed due to artificial light attraction. The trapping and removal of cats, owls, rats, and dogs will minimize predation of downed seabirds, improve discovery by on site personnel, and collection by the SOS program.

The control of predators at seabird colonies on the Na Pali Coast of the island of Kauai will carry out in-part recovery objectives identified in the PIFWO recovery strategy for Newell's shearwater and Hawaiian petrel, including to: 1) protect and enhance existing colonies, and 2)

mitigate existing threats by implementing and monitoring prioritized management actions at the species level (USFWS 1983; Holmes et al. 2011). Predation of federally listed seabirds by nonnative feral cats and barn owls has been documented in nearly all seabird colonies on the Na Pali Coast. The predator control will increase seabird survival and reproduction which could potentially expand breeding distribution of Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel. A suite of management actions, in addition to the conservation measures described in the project description will be identified in the PMRF Seabird Conservation Plan.

Beginning in 2015, benefits to offset annual impacts to the listed species will occur from conducting predator control at Honopu Valley and Makaha Ridge, an area of the Na Pali Coast with high concentrations of seabirds (Figure 5). The Service anticipates that survival and reproduction will increase for seabirds nesting in the upper slopes and cliffs in these areas from the removal cats and barn owls. Based upon modeling, predator control for Newell's shearwaters can result in up to a 7% increase in growth rate for colonies receiving management, including cat and barn owl control (Griesemer and Holmes 2011).

Additionally, the proposed action will also provide protocols for predator control implementation and monitoring that are applicable to recovery of listed seabirds. Because the majority of seabirds are breeding in cliffs in the area of the Na Pali Coast between Honopu and Makaha Ridge, direct nest site management is difficult. Barn owl control will be carried out from finger ridge(s) and cat control will be conducted along the accessible rim trails of valley(s). Development of strategic control methodologies through adaptive management will refine management tools for application in other areas where seabird management occurs.

Given the combination of conservation measures described in the paragraphs above, the Service anticipates that these measures will minimize take of listed seabirds, and provide benefits to offset take of listed seabirds and provide a net recovery benefit in excess of take. The funding provided by PMRF via INRMP funding requests to accomplish off-site seabird mitigation is currently at $58,500 for 2015 and increasing annually (Commander Navy Region Hawaii 2010).

Hawaiian Hoary Bat

Studies indicate that Hawaiian hoary bats give birth between June and August and pups may remain dependent for up to seven weeks after birth (Menard 2001, p. 35). Young bat pups cling to the mother at the roost tree during the day, and she leaves them in the tree while she forages at night, similar to the North American hoary bats (Shump and Shump 1982, p. 3). These nonvolant pups are particularly susceptible to disturbance during this life stage. If trees with dependent, non-volant pups are trimmed, cut, or cleared, during the bat pupping season, it is likely that the action will result in injury or mortality.

Current and future construction projects at PMRF may involve clearing of woody vegetation. To avoid and minimize effects of base infrastructure, operations, and maintenance on Hawaiian hoary bats, all trimming or removal of woody plants greater than 15 feet tall will be conducted outside of the Hawaiian hoary bat pupping season of June 1 to September 15 to avoid impacting bat pups.

In Hawaii, there are numerous documented instances of Hawaiian hoary bats becoming entangled in barbed wire fences (Burgett 2009, pers. comm.; Jeffrey 2007, pers. comm.; Mansker 2008, pers. comm.; Marshall 2008, pers. comm.). It is presumed Hawaiian hoary bats "turn off" their echolocation upon capturing an insect. If a bat has just captured an insect, especially a large moth or beetle, it must masticate the insect while in flight which can take several seconds and leaves the bat vulnerable to collision with objects that it cannot see or hear. When foraging Hawaiian hoary bats fly at speeds of between 5 and 10 m per second. Without being able to emit sound effectively while masticating, Hawaiian hoary bats do not sense barbed wire strands and thus become entangled in the barbed wire (Bonaccorso 2009, pers. comm.). Determining the number of bat mortalities due to barbed wire can be difficult. Many barbed wire fences are in remote areas and are not checked regularly. In wet areas, bat carcasses may decompose before they are discovered. However in arid areas, it is presumed the bat carcasses become unattractive to predators as a result of mummification and thus remain on the fences for a considerable amount of time.

At the five PMRF sites, a total of 6.88 miles of fencing is topped with three stands of barbed wire, atop chain-link fence. Because of the spacing between the barbed wire stands, we have determined that each strand acts independently from the others. Therefore, the Service evaluated the impacts from the barbed wire as a total of 20.64 miles of barbed wire. USGS has estimated that bat mortalities associated with barbed wire is approximately 1.3 bats killed per 100 miles per year. We calculated a potential mortality rate of 0.27 bats per year throughout the foreseeable future based on the USGS mortality rate of 0.013 bats killed per mile multiplied by the total miles of barbed wire fence.

As described in the "Threats, Recovery Strategy, and Ongoing Conservation Measures" section, bat life history and ecology is needed to reduce mortality to bats. If Hawaiian hoary bats are aware of the presence of fences, it is likely they would be able to avoid becoming entangled in the barbed wire. Therefore, the proposed conservation measure will contribute to the conservation and recovery efforts of the bats by evaluating a deterrent method. If successful, bat deterrents could be widely used across the range of the species thereby protecting bats from mortality associated with barbed wire fencing. If deterrents are effective, then the use of the deterrents would allow for the use of barbed wire fencing for conservation purposes to keep ungulates out of sensitive areas thereby increasing recovery efforts for other species.

Hawaiian Goose

Fewer than 10 Hawaiian geese hazings were conducted by USDA-WS at PMRF airfield in 2005 and 2006. Since that time, the number of Hawaiian geese at Barking Sands has increased substantially, and by 2009 over 600 Hawaiian geese hazings were conducted at PMRF. More than 800 hazings were carried out in 2013 with the number of hazing events peaking in September (229 events) and October (238 events) (Department of the Navy 2014). There is no data to indicate how many total birds are impacted by this level of hazing; it is likely that individual birds may be hazed several times. Given the increase in Hawaiian goose numbers at Barking Sands since 2005, the Navy and USDA-WS have determined that as many as 1,200 total Hawaiian goose hazing events per year (conducted by USDA-WS and/or PMRF Air Operations or Environmental personnel) may occur throughout the foreseeable future.

Hazing operations are designed to reduce the risk of collision between aircraft and Hawaiian geese. While the primary purpose of hazing is to protect aircraft and human safety, hazing also reduces the potential for Hawaiian geese to be injured or killed after colliding with aircraft. Although no incidents of collisions have occurred to date, it is anticipated that ongoing hazing activities reduce the impact of air traffic on flying Hawaiian geese.

Hazing activities will be conducted in a manner that will minimize and avoid adverse impacts to Hawaiian geese. The conservation measures outlined in the project description will ensure that hazing operations are carried out by individuals trained in non-lethal harassment techniques. PMRF will continue a Hawaiian goose educational campaign, which has implemented a variety of techniques to inform residents and visitors on Barking Sands about responsible interactions with the species (i.e., no feeding, watering, touching, etc.). Additionally, PMRF has committed to identifying and implementing additional habitat modification measures that may reduce the attractiveness of Barking Sands to Hawaiian geese, thereby making hazing operations less likely to be required in the future. A suite of habitat management actions, in addition to the conservation measures described in the project description will be identified in the comprehensive Hawaiian Goose Management Plan.

The implementation of PMRF's ongoing predator control program will reduce the potential for Hawaiian geese to be preyed upon by invasive species, such as feral cats, dogs and potentially mongoose. Live traps are used for predator control throughout Barking Sands and checked at least once every 48 hours. No Hawaiian geese have been caught live traps over the past 12 years at PMRF.

The Navy will conduct increased hazing prior to the Hawaiian goose nesting season in an attempt to prevent Hawaiian geese from nesting on PMRF. Although Barking Sands is not considered essential Hawaiian goose breeding habitat, it remains the only site on Mana Plain that has consistent predator control. Consistent and effective hazing will force Hawaiian geese to move away from Barking Sands to breed. Hawaiian geese that are precluded from nesting at Barking Sands may be forced to nest in sub-optimal habitats on Mana Plain that are not protected and therefore may be subjected to higher rates of egg and gosling predation in these areas. Therefore, it is anticipated that Hawaiian goose pairs that are hazed away from PMRF and establish nests in sub-par habitats may experience a loss of reproductive success for that breeding season. It is unknown how many pairs of Hawaiian geese would attempt to nest at Barking Sands if hazing was not conducted. However, during the 2011 Hawaiian goose breeding season, PMRF personnel observed approximately five pairs of Hawaiian geese that appeared to be exhibiting nesting behavior; therefore, they focused hazing efforts on these birds in order to deter them from breeding on the base.

Hawaiian geese are often observed loafing and foraging at Barking Sands runway and other locations throughout the base. Although Barking Sands may be used by Hawaiian geese for these activities, the availability of foraging and loafing habitat is not a limiting factor for the Hawaiian goose in this part of their range. Birds that are hazed away from Barking Sands have adequate foraging and loafing habitat throughout Mana Plain and western Kauai. Therefore, it is anticipated that hazing is a temporary action, and will not result in a decline in adequate foraging or loafing habitat for non-breeding Hawaiian geese. Although there is an energetic cost

associated with being forced to fly to other locations to forage or roost, it is not anticipated this will result in any reduction in fitness or survivorship of non-breeding Hawaiian geese.

The birds will be hazed using non-lethal methods outlined in these biological and conference opinions. Neither USDA-WS nor Navy staff will attempt to haze Hawaiian geese that have succeeded in laying a nest. Personnel will observe birds prior to hazing actions to determine whether a nest is present. Brooding adults (i.e., adults with an observed active nest or goslings) will not be hazed at any time. However, despite these avoidance measures, it is possible that some breeding adults with active nests may not be identified as such and therefore breeding adults may inadvertently be hazed. Hazing of adults with active nests may lead to nest abandonment (Banko 1988, Marshall pers. comm. 2012). It is unknown how often breeding adults are hazed and there are no available data on the comparative success of nests from undisturbed adults at Barking Sands verses adults that are harassed. However, it is anticipated that some breeding adults may experience hazing activities and this disturbance may lead to the loss of active nests. To date, a total of six Hawaiian goose nests or broods have been observed at Barking Sands: one in December 2009, one in January 2011, two in 2012, and two in 2013. All of these nests and broods were found after the fact, so it is possible that some or all of the adults experienced some level of hazing prior to nest or brood discovery.

Despite the inclusion of training and best management practices, it is possible that hazing operations at Barking Sands may result in the death or injury to individual Hawaiian geese. Hazed Hawaiian geese may become disoriented or stressed, causing them to collide with fences or other man-made structures. These incidents have not been documented at Barking Sands, and it is anticipated that very few, if any, Hawaiian geese will be injured or killed due to hazing activities at Barking Sands.

Mortality due to vehicle collision is a threat to Hawaiian geese at Barking Sands, Kokee, and Makaha Ridge sites. In 2011, one Hawaiian goose was struck by a vehicle at the Kokee site by a contractor visiting the site in a delivery truck. At PMRF, the Navy has installed signage near roadways to warn drivers to be wary of birds in areas where Hawaiian waterbird strikes have occurred (Department of the Navy 2014). Although Hawaiian geese have been regularly struck in wildlife areas of Hawaii where vehicle traffic is continuous and high, such as at Haleakala National Park with an average of 558 vehicles visiting the park per day from 2001 to 2011 (USFWS 2012), the Service anticipates that collisions will be a rare occurrence at PMRF sites due to the lower volume of traffic. In addition, signs will minimize potential for Hawaiian geese collisions at PMRF.

Hawaiian Waterbirds

A total of three Hawaiian duck and 12 Hawaiian stilt hazings were conducted by USDA-WS at PMRF airfield between 2005 and 2011. In most years during that period, no endangered Hawaiian waterbirds were hazed: one duck and eight stilt hazings occurred in 2006, and two ducks and four stilts were hazed in 2011. However, in 2012 the number of Hawaiian duck and Hawaiian stilt hazings substantially increased to 126 and 34, respectively. The reason for the increase in hazing events was likely a combination of an increase in these species accessing the airfield via Kinikini agricultural ditch and a change in USDA-WS personnel conducting the

hazings. Over the same duration (2005 to 2011), no Hawaiian moorhens or Hawaiian coots have been hazed at PMRF airfield. The Navy and USDA-WS have determined that as many as 200 total Hawaiian waterbirds may be hazed per year (conducted by USDA-WS and/or PMRF Air Operations or Environmental personnel) throughout the foreseeable future.

The USDA-WS conducts hazing of Hawaiian waterbirds to minimize the risk of collision with aircrafts to protect aircraft and human safety. Hazing reduces the risk of Hawaiian waterbirds being injured or killed from collisions with aircraft. Despite no incidents of collisions have occurred to date, it is anticipated that ongoing hazing activities reduce the impact of air traffic on Hawaiian waterbirds.

Hawaiian waterbird species are common in agricultural ditches and oxidiation pond at PMRF, where hazing does not occur. PMRF's ongoing predator control program will reduce the potential for these species to be preyed upon by invasive species, such as feral cats, dogs and potentially mongoose. No Hawaiian waterbirds have been caught in live traps over the past 12 years, and traps are checked once every 24 hours. Also, it is not anticipated that hazing actions at the airfield are causing Hawaiian moorhen, Hawaiian coots, and Hawaiian ducks to breed in areas outside of PMRF (i.e., forcing them to nest in sub-optimal habitat that is not protected by an active predator control program) because there have been no observations of Hawaiian waterbirds nesting at PMRF.

While Hawaiian stilts have also not been documented nesting at PMRF, as stated above, the species has been observed nesting in a variety of habitats. It is possible hazing operations may preclude Hawaiian stilts from nesting in the cleared level areas at the Barking Sands airfield. Therefore, it is anticipated that Hawaiian stilt pairs that are hazed away from PMRF and establish nests in sub-par habitats may experience a loss of reproductive success for that breeding season. The number of pairs of Hawaiian stilt that would attempt to nest at Barking Sands in the absence of hazing is unknown. Given the availability of wetland habitat in surrounding areas of Kawaiele Waterbird Sanctuary and Mana Plains and that no hazings of Hawaiian stilts occurred in most years between 2005 and 2012, the Service anticipates a minimal number would be precluded from nesting at PMRF.

Although Hawaiian waterbirds utilize agricultural ditches, the oxidation pond, and other areas at PMRF to loaf and forage, the availability of such habitat is not a limiting factor Hawaiian waterbirds in this part of their range. Adequate foraging and loafing habitat exists in wetland areas adjacent to PMRF in the Mana Plain for birds that are hazed away from PMRF. Thus, it is not anticipated that hazing will result in a loss of adequate foraging or loafing habitat for Hawaiian waterbirds. Also, it is not anticipated that the energetic cost to fly to other locations to loaf and forage will result in any reduction in fitness or survivorship of Hawaiian waterbirds.

It is possible that hazing operations at Barking Sands may result in the death or injury to individual Hawaiian waterbirds, should hazed waterbirds become disoriented or stressed, causing them to collide with fences or other man-made structures. Training in hazing and best management practices are conducted by USDA-WS and PMRF Environmental personnel, and collision incidents with fences and manmade structures have not been documented at Barking Sands. Therefore, it is anticipated that very few, if any, Hawaiian waterbirds will be injured or

killed due to hazing activities at Barking Sands. However, at Barking Sands, Kokee, and Makaha Ridge sites, mortality due to vehicle collision is a threat to Hawaiian waterbirds in addition to the effects of hazing. Since 2012, a total of three Hawaiian moorhen and two Hawaiian coots have been struck by vehicles along the main roadway of PMRF. The Navy has installed signage near roadways to warn drivers to be wary of birds in the areas where strikes have occurred (Department of the Navy 2014). The Service anticipates that the vehicle signs will minimize potential for Hawaiian waterbird collisions and that few collisions will occur due to the low volume of traffic at PMRF sites.

Hazing of Hawaiian waterbirds will be conducted in a manner that will minimize and avoid adverse impacts to these species. Only non-lethal methods, outlined in these biological and conference opinions will be conducted by USDA-WS and/or PMRF Air Operations and Environmental personnel. It is anticipated that take will be offset by conservation measures, including management of the sewage oxidation pond for Hawaiian waterbirds, funding waterbird conservation in the SOS program, and funding predator control at KPNWR.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur within the area of action subject to consultation. Future Federal actions will be subject to the consultation requirements established in section 7 of the ESA and, therefore, are not considered cumulative for the proposed action.

It is reasonable to expect that development on the island of Kauai will continue to increase. Increased development may increase the density of mammalian predators adversely affecting listed Hawaiian seabirds. Development may also increase lighting levels and transmission/communication lines in the area, resulting in additional impacts to seabird species. Pursuant to the ESA, these impacts would be assessed in biological opinions and minimized and mitigated to the maximum extent practicable via development and implementation of Habitat Conservation Plans. For example, the Kauai Seabird Habitat Conservation Program has been in development since 2007 and is being designed to minimize and mitigate for lighting and collision impacts to Hawaiian seabirds on the island of Kauai.

Fences with multiple strands of barbed wire that support agriculture and ranching in the vicinity of the action area for this project may impact bats. If the bat deterrents that will be evaluated due to implementation of the proposed project are determined to be successful at reducing bat mortality due to barbed wire fences, the bat deterrents could be applied to other ranching activities in the area.

DOFAW has initiated the restoration of a 105-acre wetland and coastal upland on Mana Plain, next to the existing Kawaiele Waterbird Sanctuary. Both sites are located on the State's Mana Plain Forest Reserve [TMK (4) 1-2-2; por. 1], and are immediately adjacent to Barking Sands. The purpose of the project is to provide essential wetland habitat for federally endangered waterbirds, including the Hawaiian duck, Hawaiian stilt, Hawaiian coot, and Hawaiian moorhen. DOFAW is aware that PMRF is concerned the newly restored area may attract Hawaiian geese

and Hawaiian waterbirds to the area, thereby increasing BASH hazards at PMRF. Plans for the restoration project include measures to deter loafing and breeding Hawaiian geese, including vegetated berms, no irrigated grasses, low water depths in created ponds, etc. However, in a letter to DOFAW, dated June 22, 2012, the Service acknowledged that despite these measures, some Hawaiian geese are likely to be attracted to the site (2012-TA-0346). It is anticipated the Hawaiian goose and Hawaiian waterbird population on Mana Plain and this wetland will increase over the next decade, likely resulting in increased Hawaiian goose and Hawaiian waterbird flights and visitation to Barking Sands.

CONCLUSION

After reviewing the current status of the Newell's shearwater, Hawaiian petrel, Hawaiian hoary bat, Hawaiian goose, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, and Hawaiian stilt, the environmental baseline of these species in the proposed action area, and the effects of the proposed action, including cumulative effects, it is the Service's biological and conference opinions that the PMRF base-wide infrastructure, operations, and maintenance will adversely affect these species, but will not jeopardize their survival and recovery in the wild. Critical habitat has not been designated for these species; therefore, none will be affected.

The adverse effects of the proposed action are not likely to jeopardize the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel because (a) PMRF lighting practices will minimize seabird fallout and (b) predator control for seabird colonies will offset incidental take and provide a net benefit to the status of these species as a whole. As discussed in environmental baseline, nonnative predators are significantly impacting seabird populations along the Na Pali Coast. Barn owl control at Makaha Ridge, feral cat control at Honopu Valley, and other nesting colony protection measures will decrease seabird mortalities and increase survival and reproduction in an area of the Na Pali Coast with large concentrations of listed seabirds.

The adverse effects of the proposed action are not likely to jeopardize the Hawaiian Hoary bat because incidental take will be avoided and minimized and conservation measures will offset any incidental take that occurs on the installation. To avoid impacts to Hawaiian hoary bat pups, tree trimming or removal of woody plants greater than 15 feet tall will be conducted outside of the Hawaiian hoary bat pupping season. Bat collisions with barbed wire fence will be minimized by research on deterrents. Conservation measures that contribute to the recovery of the Hawaiian hoary bat, such as studies of bat habitat associations on Kauai, will be implemented should any take occur at PMRF.

The adverse effects of the proposed action are not likely to jeopardize the Hawaiian goose, because the conservation measures are anticipated to avoid, minimize, and offset the adverse effects. Hazing activities will be conducted in a manner that will minimize and avoid adverse impacts to Hawaiian geese, including non-lethal techniques carried out by trained personnel. Habitat modifications will decrease the attractiveness of sites to Hawaiian geese for foraging and nesting. Additionally, a suite of conservation measures will benefit Hawaiian geese populations including public education to deter interaction with geese, signs for vehicles to minimize potential for collision, and predator control.

The adverse effects of the proposed action are not likely to jeopardize the Hawaiian moorhen, Hawaiian coot, Hawaiian duck, and Hawaiian stilt because as discussed in the above environmental baseline, the numbers of these birds hazed at airfields has been historically low and conservation measures are anticipated to avoid, minimize, and offset the adverse effects. The loss of low numbers of these species will have a minimal impact on the status of the species as a whole. Signs near roadways will minimize potential for vehicle collision with Hawaiian waterbirds. Restoration of sewage oxidation pond for foraging and loafing habitat, funding waterbird conservation in the SOS program, and predator control will increase reproduction and survival of these Hawaiian waterbirds.

For the conference opinion the adverse effects of the proposed action are not likely to jeopardize the band-rumped storm petrel, (a) PMRF lighting practices will minimize seabird fallout and (b) predator control for seabird colonies will offset incidental take and provide a net benefit to the status of these species as a whole. As discussed in environmental baseline, nonnative predators are significantly impacting seabird populations along the Na Pali Coast. Barn owl control at Makaha Ridge, feral cat control at Honopu Valley, and other nesting colony protection measures will decrease seabird mortalities and increase survival and reproduction in an area of the Na Pali Coast with large concentrations of listed seabirds.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Navy and NNSA so that they become binding conditions for the exemption in section 7(o)(2) to apply. If the Navy and NNSA (1) fail to assume and implement the terms and conditions or (2) fail to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Navy and NNSA must report the progress of the action and its impact on the species to the Service as specified in this incidental take statement and reporting requirements below [50 CFR 402.14(i)(3)].

Amount or Extent of Take Anticipated

Based on the analysis presented in these biological and conference opinions, the Service anticipates the following incidental take may occur for as long as PMRF infrastructure, operations, and maintenance are active and in place.

Newell's Shearwater
Up to an average of three (3) fledgling Newell's shearwaters per year and a maximum of nine (9) fledgling Newell's shearwaters in one year may be taken in the form of injury or death due to attraction and fallout from lighting associated with the project.

Hawaiian Petrel
Up to an average of one (1) fledgling Hawaiian petrel every ten years and a maximum of two (2) fledgling Hawaiian petrels in one year may be taken in the form of injury or death due to attraction and fallout from lighting associated with the project.

Band-rumped Storm Petrel
Up to an average of two (2) fledgling band-rumped storm petrels every ten years and a maximum of four (4) fledgling band-rumped storm petrels in one year may be taken in the form of injury or death due to attraction and fallout from lighting associated with the project.

Hawaiian Hoary Bat
Up to an average of one (1) Hawaiian hoary bat every three years and a maximum of three (3) Hawaiian hoary bats in one year may be taken in the form of injury or death due to entanglement on barbed-wire fences.

Hawaiian Goose
Up to an average of two (2) Hawaiian geese per year and a maximum of four (4) geese in one year may be taken in the form of injury of death due to collision with fences, other manmade structures, or vehicles as a result of hazing activities. Ten (10) eggs or goslings may also be incidentally taken indirectly in the form of injury or mortality due to nest failure or abandonment of two (2) nests (5 eggs per nest) as a result of inadvertent hazing of nesting adults. And, fifty (50) eggs or goslings may be taken indirectly in the form of injury or mortality due to nest failure or reduced breeding success of ten (10) nests laid in sub-optimal, unprotected habitats of Hawaiian geese which were precluded from nesting at PMRF as a result of hazing activities.

Hawaiian Moorhen
Up to an average of two (2) Hawaiian moorhen per year and a maximum of four (4) moorhens in one year may be taken in the form of injury of death due to collision with fences, other manmade structures, or vehicles as a result of hazing activities.

Hawaiian Coot
Up to an average of one (1) Hawaiian coot per year and a maximum of two (2) coots in one year may be taken in the form of injury of death due to collision with fences, other manmade structures, or vehicles as a result of hazing activities.

Hawaiian Duck
Up to an average of one (1) Hawaiian duck per year and a maximum of two (2) ducks in one year may be taken in the form of injury of death due to collision with fences, other manmade structures, or vehicles as a result of hazing activities.

Hawaiian Stilt
Up to an average of one (1) Hawaiian stilt per year and a maximum of two (2) stilts in one year may be taken in the form of injury of death due to collision with fences, other manmade structures, or vehicles as a result of hazing activities. Twenty (20) eggs or chicks may be taken indirectly in the form of injury or mortality due to nest failure or reduced breeding success of five (5) nests (4 eggs per nest) laid in sub-optimal, unprotected habitats of Hawaiian stilts which were precluded from nesting at PMRF as a result of hazing activities.

The Migratory Bird Treaty Act (MBTA) of 1918 as amended (16 USC 703-712) prohibits the take of migratory birds. The MBTA provides no process for authorizing incidental take of MBTA-protected birds. The Service will not refer the incidental take of any migratory bird species for prosecution under the MBTA, if such take is in compliance with the terms and conditions (including amount and/or number) specified in the Incidental Take Statement.

Effect of the Take

The Service determines that this level of anticipated take is not likely to jeopardize the survival or recovery of the Newell's shearwater, Hawaiian petrel, band-rumped storm petrel, Hawaiian hoary bat, Hawaiian goose, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, or Hawaiian stilt. No critical habitat has been established for these species, so none will be affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take:

1. The Navy and NNSA will minimize direct and indirect effects of lighting to the Newell's shearwater and Hawaiian petrel at PMRF. The Navy will implement conservation actions to assist in stabilization of Newell's shearwater and Hawaiian petrel on the island of Kauai.

2. The Navy and NNSA will minimize Newell's shearwater and Hawaiian petrel mortality through on the ground activities by developing a Service approved search protocol, training personnel about listed seabird fallout and methods for searching for downed birds, and conducting searches for downed listed seabirds at all facilities on the installation with lighting and under communication towers and electrical distribution lines.

3. The Navy and NNSA will minimize direct and indirect effects of clearing of woody vegetation through avoidance of activities during pup rearing period. Entanglement on

barbed-wire fences to the Hawaiian hoary bat will be minimized through development and implementation of deterrents and offsetting any losses through conservation actions.

4. The Navy and NNSA will minimize direct and indirect effects of hazing operations to the Hawaiian goose, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, or Hawaiian stilt associated with BASH operations at PMRF. Road signage will minimize potential for vehicle collision with Hawaiian waterbirds. Conservation measures to restore habitat and conduct predator control will increase reproduction and survival.

The prohibitions against taking the band-rumped storm-petrel found in section 9 of the ESA will not apply until the species is listed. However, the Service advises the Navy and NNSA to consider implementing the following reasonable and prudent measures. If this conference opinion is adopted as a biological opinion following a listing designation, these measures, with their implementing terms and conditions, will be nondiscretionary.

1. The Navy and NNSA will minimize direct and indirect effects of increased lighting to seabirds at PMRF.

2. The Navy and NNSA will minimize band-rumped storm-petrel mortality through on the ground activities by developing a project-specific search protocol, training personnel about listed seabird fallout and methods for searching for downed birds, and conducting searches for downed listed seabirds at all facilities on the installation with lighting and under communication towers and electrical distribution lines.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Navy and NNSA must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and specified reporting requirements. These terms and conditions are nondiscretionary. In order to implement the reasonable and prudent measure above, the Navy and NNSA will monitor incidental take as described in Appendix B for monitoring communication towers. The Navy and NNSA will also follow the protocols to report downed wildlife in Appendix B, Attachments 1 and 3, when any carcass of a listed species is found injured or dead.

Because the amount of incidental take anticipated for Newell's shearwater, Hawaiian petrel, band-rumped storm petrel, Hawaiian hoary bat, Hawaiian goose, and Hawaiian waterbirds are expressed in terms of the average number of individuals that may be taken, the following formula will be used to calculate average take for these species:

$$R_p = \frac{b_p}{p}$$

Whereby "b_p" is the total take of the species since date of BO issuance, including seabird take from fallout and seabird fatality estimates calculated using methodologies of Appendix B, "p" is

the take assessment period expressed as the total number of years since date of BO issuance, and "R_p" is the average take of the species per year over the take assessment period.

The amount of incidental take anticipated for Hawaiian petrel, band-rumped storm petrel, and Hawaiian hoary bat are expressed in terms of the average number of individuals that may be taken over a period longer than one year (e.g., one every ten years). The following describes the annual accrual of incidental take for these species that will be used in combination with the calculated average take (above) to determine if the amount or extent of take is exceeded. For Hawaiian petrel, the amount of anticipated incidental take will begin with 1 fledgling in year 1, accrue in increments of 0.1 fledgling per year, and result in 2 fledglings by year 11, etc. (not to exceed 2 fledglings in one year). For band-rumped storm petrel, the amount of anticipated incidental take will begin with 2 fledglings in year 1, accrue in increments of 0.2 fledgling per year, and result in 4 fledglings by year 11, etc. (not to exceed 4 fledglings in one year). For Hawaiian hoary bat, the amount of anticipated incidental take will begin with 1 bat in year 1, accrue in increments of 0.33 bat per year, and result in 2 bats by year 6, etc. (not to exceed 3 bats in one year).

- The Service will be notified by telephone and email within 24 hours upon the discovery of an injured or dead Newell's shearwater, Hawaiian petrel, band-rumped storm petrel, Hawaiian hoary bat, Hawaiian goose, Hawaiian moorhen, Hawaiian coot, Hawaiian duck, or Hawaiian stilt. This includes notification for listed or candidate species turned into the SOS aid station by Navy personnel or members of the public. The Navy and NNSA will provide the Service a written notification, summarizing the event, within 30 days.

- The Service will be notified by telephone and email within 24 hours upon the discovery of an abandoned Hawaiian goose nest or listed Hawaiian waterbird nest. The Navy and NNSA will provide the Service a written notification, summarizing the event, within 30 days.

- Access to any of the PMRF sites will be provided by the Navy and NNSA to the Service with 24 hour notification so that they may independently monitor for downed seabirds and retrieve reported carcasses.

- The Navy and NNSA will submit annual reports detailing the implementation of the above Conservation Measures used to minimize impacts and compensate for effects of the action. Annual reports will also summarize survey and monitoring results, BASH hazing efforts, and levels of take of all ESA-listed species. The first report will be submitted at the end of the first fiscal year following the issuance of these biological and conference opinions and continue annually throughout the life of the project.

- Conservation measures are outlined within this document pages 17-20. Any failure by the Navy and NNSA to implement conservation measures to offset incidental take of listed seabirds, including predator control in 2015 and 2016 as well as the measures that will be identified in the PMRF Seabird Conservation Plan, will result in the need to reinitiate this consultation.

- Should take of listed species occur and the carcass recovered, the Service may request that the carcass be shipped to Honolulu for necropsy and species verification. Otherwise, the depository designated to receive specimens of the listed species that are found is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817 (telephone: 808/847-3511). If the B.P. Bishop Museum does not wish to accession the specimens, contact the Service's Division of Law Enforcement in Honolulu, Hawaii (telephone: 808/861-8525; fax: 808/861-8515) for instructions on disposition.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends that the Navy and NNSA undertake the following conservation measures:

1. Assist with island- and State-wide efforts to assess and minimize the effects of communications towers, power transmission lines, lighting, and other threats to listed seabirds posed by infrastructure.

2. The Navy and NNSA will consider listed seabirds when scheduling missile tests, and will avoid testing during the seabird fledging season whenever possible.

3. The Navy and NNSA should contribute funds to ongoing Hawaiian hoary bat research aimed at increasing our understanding of migration and resource use patterns on the island of Kauai. As stated in the Recovery Plan for Hawaiian hoary bats, the overall recovery strategy for the Hawaiian hoary bat is to utilize research that provides information on the subspecies' abundance and distribution, life history, and habitat associations. With currently available information being limited, even the most basic management actions cannot be undertaken with any certainty of benefit. Therefore, the studies conducted to examine migration and resource use will help us understand habitat use and increase our ability to make wise conservation decisions to benefit the Hawaiian hoary bat on the island of Kauai.

4. The Navy and NNSA should continue efforts to identify another site on Mana Plain that can be restored and managed for the benefit of Hawaiian geese and Hawaiian waterbirds, which will provide an alternate protected location and likely draw Hawaiian geese and Hawaiian waterbirds away from Barking Sands.

5. The Navy and NNSA should develop in coordination with the Service and fund an outpalnting project for *Panicum niihauense* into the critical habitat unit at Barking Sands.

REINITIATION STATEMENT

This concludes formal section 7 consultation on this action. As required in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

You may ask the Service to confirm the conference opinion as a biological opinion issued through formal consultation if the band-rumped storm-petrel is listed. The request must be in writing. If the Service reviews the proposed action and finds that there have been no significant changes in the action as planned or in the information used during the conference, the Service will confirm the conference opinion as the biological opinion on the project and no further section 7 consultation will be necessary.

After the listing of the band-rumped storm-petrel as endangered/threatened and/or designation of critical habitat for the band-rumped storm-petrel and any subsequent adoption of this conference opinion, the Navy and NNSA shall request reinitiation of consultation if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect the species or critical habitat in a manner or to an extent not considered in this conference opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the species or critical habitat that was not considered in this conference opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action.

The incidental take statement provided in this conference opinion does not become effective until the species is listed and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the band-rumped storm-petrel has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the band-rumped storm-petrel may occur between the listing of the species and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation.

We appreciate your efforts to conserve protected species. If you have any questions concerning these biological and conference opinions, please contact Adam Griesemer of the USFWS Pacific Islands Fish and Wildlife Office at (808) 792-9400.

Sincerely,

Loyal Mehrhoff
Field Supervisor

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APPENDIX A: Air Operations and Environmental Positions Covered for Hazing/BASH Operations Under this Biological Opinion

Air Operations Personnel:
Air Operations Officer
Aviation Safety Officer
Airfield Manager
Assistant Airfield Manager
Air Operations Chief
Transient Line 1
Transient Line 2
Transient Line 3
Transient Line 4
Transient Line 5
Transient Line 6
Transient Line 7
Transient Line 8
Transient Line 9
Transient Line 10
Transient Line 11

Environmental Personnel:
Environmental Coordinator
Natural Resources Biologist
Range Complex Sustainment Coordinator
Range Complex Sustainment Coordinator

Appendix B. Carcass search protocol provided by USFWS to be used for monitoring for nocturnal seabird fallout at communication towers at PMRF.

1.0 STANDARDIZED CARCASS SEARCHES

Carcass searches will be conducted to estimate the number of avian fatalities attributable to the broadcast towers. An estimate of the total number of carcasses will be made by adjusting for removal bias (affected by scavenging) and searcher efficiency bias (affected by detection) (see Sections 2.0 and 3.0). The methods, timing, and duration of the carcass searches are described below.

1.1 Methods

Personnel trained in proper search techniques ("the searchers") will conduct carcass searches at the broadcast tower location pursuant to timing specified by the carcass scavenging trials, but no less than two times per week. Boundaries of square plots will be delineated along each broadcast tower. A strip transect design is appropriate for this study, providing almost 100 percent coverage of the search area. Each search plot will be split into four quadrants, with each searched sequentially. This facilitates the searchers ability to stay on transect lines and maximize searching efficiency (Gritski pers. comm. 2006).

Important factors considering in developing this monitoring plan include tower dimensions, target species size, and vegetation structure. Because most carcass searches to date have been associated with wind power projects, we use standards developed for that industry. When carcass searches are conducted for wind turbines, plot size typically extends outward from the base of a wind turbine a minimum distance equal to the turbine height.

The subject towers are variable in height. If the results from the initial carcass surveys show that the plot size is too large or small, the area will be adjusted accordingly pending approval by the Service. Geographic Positioning System (GPS) locations of the search plot corners will be included in initial data collection. Transects will be set at approximately 6 meters (19.7 feet) apart, depending on the habitat type, and the searcher will walk along each transect at a rate of 45-60 m per minute searching both sides out to 3 m (10 feet) for downed birds and bats. Search area and speed may be adjusted by habitat type, after evaluation of the first searcher efficiency trial, if needed. The applicant may request approval from the Service to revise the search protocol. Since equipment cabinets and other structures associated with the towers will obstruct transects, the areas with equipment will be searched such that those areas have 100% coverage.

If a carcass of a listed species is found, searchers will follow the Downed Wildlife Protocol (**Attachment 1**), and carcasses will be left in place and moved only if directed by the Service. If directed to move the carcasses, searchers will deliver carcasses to Service Law Enforcement who will send them to a forensics lab for future reference and necropsy.

All carcasses found during the standardized carcass searches will be recorded and identified by a unique number. A copy of the data sheet for each carcass will be kept with the carcass at all times. For each carcass found, searchers will record species, sex and age when possible, date and time collected, location, condition and any comments that may indicate cause of death (**Attachment 2**). Searchers will record the condition of each carcass found, using the following condition categories:

- Intact – a carcass that is completely intact, is not badly decomposed and shows no sign of being fed upon by a predator or scavenger
- Scavenged – an entire carcass that shows signs of being fed upon by a predator or scavenger, or portions of a carcass in one location (e.g., wings, skeletal remains, legs, pieces of skin, etc.)
- Feather Spot – 10 or more feathers at one location indicating predation or scavenging or 2 or more primary feathers

Searchers will photograph each carcass as found and establish GPS points, with point accuracy provided. A detailed map of the search area will then be created showing the location of the broadcast towers and associated facilities, the study area, and any carcasses located.

The searchers may discover carcasses incidental to formal carcass searches (e.g., predation or while driving within the project area). For each incidentally discovered carcass, the searcher will identify, photograph, and record data for the carcass as would be done for carcasses found during formal scheduled searches.

Any injured native birds found on the facility site will be carefully captured by a trained project biologist or technician and transported to a local wildlife rehabilitator. All project staff and consultants will be trained on how to handle any downed wildlife or carcasses found anywhere within the project area. Furthermore, a Downed Wildlife Incident Report (**Attachment 3**) will be completed for any injured or killed animal found.

1.2 Important Considerations

Important factors to consider in developing the monitoring plan include target species size and the type of vegetative cover being surveyed. The Hawaiian petrel and Hawaiian goose are relatively large birds. Downed individuals should be detectable compared to smaller bird species and most bats.

2.0 CARCASS SCAVENGING TRIALS

"Carcass scavenging or removal" is the disappearance of a carcass from the search area due to scavenging. This may serve as a potential source of bias associated with fatality rate estimation. Scavengers may preclude detection of carcasses or make it problematic to identify remains and determine cause of death. Thus, seasonal differences in scavenging rates (i.e., changes in scavenger population density) and possible differences in the size of animal being scavenged are typically taken into account when estimating fatality. Additionally, the timing of fatality searches must be conducted at a frequency that minimizes loss due to scavenging.

The objective of the carcass scavenging trials is to document the length of time avian carcasses remain in the search area and subsequently determine the frequency of carcass searches within the search plots. Carcass scavenging trials will be conducted during each season in the vicinity of the search plots. Carcass scavenging rates will be used to adjust carcass surveys for removal bias. Removal rates will be determined for each season.

Carcasses used in the trials may include representatives of the seabirds if legally available and permitted by the Service and DOFAW. Navy will coordinate with the Service to follow appropriate protocols in using carcasses during carcass scavenging trials. Carcasses of legally

obtained wedge-tailed shearwaters, commercially available adult game birds, or cryptically colored chickens will be used to simulate seabirds.

To avoid confusion with broadcast tower-related fatalities, planted carcasses will not be placed in fatality monitoring search plots. Planted carcasses will be placed in the vicinity of the broadcast towers but not so near as to attract scavengers to the search plots. The planted carcasses will be located randomly within the carcass scavenging trial plots.

Carcasses will be placed in a variety of postures to simulate a range of natural conditions. For example, birds will be: 1) placed in an exposed posture (e.g., thrown over the shoulder), 2) hidden to simulate a crippled bird (e.g., placed beneath a shrub or tuft of grass) and, 3) partially hidden. Trial carcasses will be marked discreetly for recognition by searchers and other personnel. Trial carcasses will be left at the location until the end of the carcass scavenging trial.

Carcasses will be checked as follows, although actual intervals may vary. Carcasses will be checked for a period of 28 days to determine removal rates; however, total number of searcher days will be adjusted according to observed scavenging rates. Carcasses will be checked approximately every day for the first 7 days, and then on day 10, day 14, day 21, and day 28. This schedule may vary depending on the initial removal rate observed, weather, and coordination with the other survey work. At the end of the 28-day period, any remaining trial carcasses and scattered feathers will be removed. Each trial will use as many bird carcasses as are available; the target is 10-20 carcasses.

3.0 SEARCHER EFFICIENCY TRIALS

The objective of searcher efficiency trials is to estimate the percentage of bird fatalities that searchers are able to find. Searcher efficiency will be estimated by habitat type and season. Estimates of searcher efficiency will be used to adjust carcass counts for detection bias. Searcher efficiency trials will be conducted on the fatality monitoring search plots in all habitat types.

Searcher efficiency trials will be conducted in each season as defined above, during the period in which the fatality monitoring occurs. Trials will be spread throughout the year to incorporate the effects of environmental variables such as weather and scavenger populations. Key elements of these trials include:

- At least three trials will be conducted in each season.
- Each trial will use a variable number of carcasses so that the searcher will not know the total number of trial carcasses being used in any trial.
- For each trial, birds will be used according to their availability.
- Wedge-tailed shearwater will be the primary species used for searcher efficiency trials.
- Personnel conducting searches will not know in advance when trials are conducted; nor will they know the location of the trial carcasses.
- Carcasses will be placed in a variety of postures to simulate a range of conditions. For example, birds will be: 1) placed in an exposed posture (thrown over the shoulder), 2) hidden to simulate a crippled bird and 3) partially hidden.

- Each non-domestic carcass will be discreetly marked and located with GPS at the planted site so that it can be identified as an efficiency trial carcass after it is found.
- The number and location of the efficiency trial carcasses found during the carcass search will be recorded.

If new searchers are brought into the search team, additional detection trials will be conducted to ensure that detection rates incorporate searcher differences.

4.0 SAMPLING INTENSITY AND DURATION

Search efforts will begin in mid-October and end in mid-December. Each tower will be checked twice per week, with no greater than three days between surveys. This will be very useful in increasing the efficiency of the study since scavenging rate detections will determine the appropriate search frequency. If scavenging is high, search frequency needs to be high (see Arnett 2005).

However, based on Service recommendations, carcass searches will be conducted approximately two times per week or no longer than 3 days apart during the initial scavenging trial. Once data from the initial scavenging trial has been evaluated, the frequency of carcass searches will be adjusted accordingly for effectiveness and efficiency for the remainder of the fall 2008 survey season, as approved by the Service. Additional surveys may be conducted after climatic conditions/events, such as storm events, fog, or moonless nights, as these events could increase the likelihood of collisions with broadcast towers.

Changed circumstances such as hurricanes, major storms, fire, and other such events may affect the timing of the surveys. If the broadcast towers are not accessible as a result of storm events or road conditions, and/or staff safety is questionable, the surveys will continue as soon as is safely possible. The Navy will coordinate with the Service on such changed circumstances as soon as possible.

5.0 ANALYTICAL METHODS FOR FATALITY ESTIMATES

Estimates of avian fatalities during the life of the broadcast towers are based on the following:

(1) The number of carcasses located during standardized searches for which the cause of death is attributed to the broadcast towers; carcasses found within survey plots are assumed to be the result of the broadcast tower unless other obvious indicators exist.

(2) Carcass scavenging rates expressed as the estimated average time a carcass is expected to remain in the study area and be available for detection by the searchers during the entire survey period.

(3) Searcher efficiency expressed as the proportion of planted carcasses found by searchers.

The following sections describe how the avian fatalities will be quantified.

5.1 Fatality calculations

The estimate of total fatalities is based on the number of fatalities found within the survey plots, confirmed to be attributed to the broadcast towers, and adjusted for the probability that the

observer found the carcass and the time that the caresses remained to be found (i.e., was not scavenged). Calculations are based on Young et al. (2003) and are presented below.

5.1.1 Number of carcasses

The average number of carcasses per search period is calculated using:

$$\bar{c} = \frac{\sum_{i=1}^{k} c_i}{k}$$

where c_i is the number of carcasses found at broadcast tower i, and k is the number of broadcast towers searched.

Total number of carcasses found is calculated by:

$$C = k * \bar{c}$$

5.1.2 Searcher Efficiency

Searcher efficiency (p) was calculated as the proportion of the carcasses found by observers divided by the total number of carcasses available to find.

$$p = \frac{p(1-p)}{n}$$

5.1.3 Scavenging rate

The average number of days that a carcass remained on site is calculated using:

$$\bar{t} = \frac{\sum_{i=1}^{k} t_i}{k}$$

where t_i is the number of days each carcass remained on the study area and k is the number of carcasses evaluated.

5.1.4 Mortality estimate

The estimated total number of fatalities is calculated by

$$m = \frac{N * I * C}{k * \bar{t} * p}$$

where N is the total number of broadcast towers, I is the time between searches (days), C is that total number of carcasses during the study period, k is the number of broadcast towers searched, $\bar{t}$ is the mean length of time a carcass remained on the plot, and p is the searcher efficiency.

6.0 RESULTS

Fatality rates will be calculated on the project as a whole. Each season's percent searcher efficiency will be applied to the observed direct take (carcasses found, if any, during searches) to quantify adjusted take (direct and unobserved direct take combined). Variance will not be calculated pursuant to Service recommendation.

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Attachment 1

Downed Wildlife Protocol

DOWNED WILDLIFE PROTOCOL *

Downed birds (any seabirds, and or Hawaiian short-eared owl) considered here may be dead or injured at discovery. All need immediate attention by the discoverer.

A ***prioritized*** Contact List of Service and Division of Forestry and Wildlife (DOFAW) Staff follows, prioritized from first to last to contact. It is essential for you to actually speak with a person and not to rely on voicemail as "a contact"; however you may leave a message and then contact the next person in the listing.

DEAD BIRD:

- Leave in place, the Service or DOFAW will do site and circumstantial assessment, make photographs, and measurements before securing and removing bird.

- Contact Service about find; Call list for Service staff, in order for calling:
    1. Adam Griesemer 808-285-8261 or 808-822-2175
    2. Law Enforcement 808-861-8525

INJURED BIRD:

Equipment necessary to have available for response:

- Pet carriers (medium) – 2 available at minimum
- Cardboard small animal (rat/rabbit/hamster) carriers – 2 minimum
- Pieces of artificial turf/outdoor carpeting to place on floors of pet carriers
- Non-tippable shallow dog water-bowls for water; water
- Gloves
- Tent stakes (6)

Procedure

1. Gently pick up and place bird into carrier equipped with turf/carpet. Place only 1 bird in a carrier.
2. Mark exact spot of find(s) with tent stake(s).
3. Place the bird in the SOS aid station at PMRF, or transport to Kauai Humane Society if the bird was picked up after the SOS aid station was checked for the day.
4. DO NOT feed birds, provide water in bowl.
5. Notify the Service within 24 hours by telephone, using call list above, and by email - adam_griesemer@fws.gov.

Attachment 2

Avian Fatality Survey Form

Page ____ of ____

Downed Wildlife Survey

Location: _____ **Observer:** _____ **Date:** _____

Start Time: _____ **End Time:** _____

Environmental Conditions:

Cloud Cover:____ (0=about 25%, 1=26-50%, 2=51-75%, 3=76-100%) **Temperature:**_____

Precipitation:____Rain____Fog____Other____ (0=None, L=light, M=Moderate, H=Heavy, Other= Hail, Snow)

Wind:_____ 0=<1 mph, 1=1-3 mph (leaves barely move), 2=3-7 mph (leaves rustle, small twigs move),
3=8-12 mph (sm. Twigs move), 4=13-18 mph (sm. Branches move) 5=12-24 mph (lg. Branches move trees sway)

Vegetation: Ave. ht. _____**(cm); Ave. vigor** _____ (**G** = Green, **M** = Mixed, **B** = Brown);
Cover _____% (% ground obscured by plant cover), record details in comments

Tower No.	Species	Sex	Age	Remains	Dir. From Tower	Dist. From Tower	UTM N	UTM E	Approx. Carcass Age	Photo nmbrs	Vegetation Type	Comments

Species: 4-letter code
Sex: sex of animal if known (**M** = Male, **F** = Female); **Age:** **A** = Adult, **S** = Subadult, **J** = Juvenile
Remains: **E**=Entire body, **W**=Wing, **F**=Feathers/Fur, S=feather spot (10 or more, or 3 primaries),**B**=Bones, **O**=Other (add to Comments)
Dir. From Tower: Compass direction of carcass from Tower base
Dist. From Tower: Distance (meters) of carcass from Tower
Carcass age: Approximate age in days of carcass remains
Comments: Print notes as needed

Attachment 3

Downed Wildlife Incident Report

Location	
Date and Time Identified	
Species	
Probably Cause of Injury/Death	
Action Taken	
Other Comments	
Name of Observer	

Biological Opinion of the U.S. Fish and Wildlife Service for the Proposed Base-wide Infrastructure, Operations, and Maintenance Activities at the Pacific Missile Range Facility, Island of Kauai, Hawaii

Photo Credits: Rocket launch at Barking Sands, COMNAVREGHI 2010; Newell's shearwater, Tracy Anderson, Save Our Shearwaters Program.

August 20, 2018
(01EPIF00-2015-F-0227)

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United States Department of the Interior

FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawaii 96850

In Reply Refer To:
01EPIF00-2014-F-0066
01EPIF00-2015-F-0227

V. R. Johnson
Captain, U.S. Department of the Navy
Commanding Officer
Pacific Missile Range Facility
P.O. Box 128
Kekaha, Hawaii 96752-0128

Susan Lacy
Sandia Field Office
Department of Energy
National Nuclear Security Administration
P.O. Box 5400
Albuquerque, New Mexico 87185

Subject: Reinitiation of Formal Consultation on Proposed Base-wide Infrastructure, Operations, and Maintenance Activities at the Pacific Missile Range Facility (PMRF) on Kauai, Hawaii

Dear Mr. Johnson and Ms. Lacy:

This document transmits the U.S. Fish and Wildlife Service's (Service or USFWS) biological opinion addressing the subject action, as revised, and its effects on the threatened Newell's shearwater (*Puffinus auricularis newelli*). The U.S. Department of the Navy (Navy) and the U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA) formally requested reinitiation of formal consultation on the subject action on April 9, 2015 in light of changes to the project description and higher than anticipated take levels of the shearwater that were addressed in the original biological opinion, dated September 9, 2014, for this action. Your request for reinitiation of formal consultation was received on April 9, 2015. This biological opinion was prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C 1531 et seq.).

This biological opinion is based on: (1) information the Service received on May 1, 2018 in the April 2018 Navy and NNSA revised biological assessment (BA) prepared for the reinitiation of formal consultation on the subject action; (2) information cited in the Service's 2014 biological opinion (Service file no. 01EPIF00-2014-F-0066) on the original project description; (3) email and letter correspondence between the Service, Navy and the NNSA regarding changes to the project

description; (4) site visits conducted by the Service on September 15, 2015 to Kokee Sites, and on November 23, 2015 to Barking Sands and Makaha Ridge; (5) the *Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan* (USFWS 1983); and (6) other literature cited herein (see the Literature Cited section below). A complete decision record of this consultation is on file at the Service's Pacific Islands Fish and Wildlife Office in Honolulu, Hawaii.

Consultation History

September 9, 2014: The Service issued a biological opinion (Service file no. 01EPIF00-2014-F-0066) addressing PMRF Base-wide Infrastructure, Operations, and Maintenance Activities. The Consultation History section of that biological opinion is herein incorporated by reference.

October 23, 2014: The Service received an email from the Navy indicating take of 10 Newell's shearwaters at PMRF Barking Sands between the nights of October 16 and October 22, 2014. The Incidental Take Statement accompanying the biological opinion anticipated an average take of three fledgling shearwaters per year with a maximum take per year of nine fledgling shearwaters.

November 12, 2014: The Service formally advised the Navy and the NNSA of the need to: reinitiate formal consultation to revise analyses of take impacts to the Newell's shearwater based on higher than anticipated take levels; update measures under the proposed action to further avoid and minimize take impacts; develop protocols to insure preparedness for the seabird fledgling season; and develop additional conservation measures under the proposed action to provide conservation benefits to the Newell's shearwater commensurate with increased take impacts.

April 9, 2015: The Service received a letter from the Navy requesting reinitiation of formal consultation on PMRF Base-wide Infrastructure, Operations, and Maintenance Activities for purposes of addressing higher than anticipated take of the Newell's shearwater and revision of conservation measures under the proposed action for the Newell's shearwater.

April 16, 2015: Formal consultation was reinitiated effective this date.

July 23, 2015: The Service sent a letter to the Navy indicating that, although additional details were forthcoming, there was sufficient information to reinitiate formal consultation as of April 16, 2015. The letter also estimated the issuance date for a new biological opinion as August 31, 2015. In addition, the Service informed the Navy that it was necessary to update the status of the species and environmental baseline analyses in the opinion for the Newell's shearwater due to new information regarding increased impacts to the species caused by collisions with utility structures.

August 14, 2015: The Service received a letter and enclosure from the Navy describing proposed conservation measures for the Newell's shearwater; and draft guidelines for implementing those conservation measures at the PMRF.

August 20, 2015: Adam Griesemer of the Service met with Cory Compora, April Teekell, and John Nelson of the Navy (via a conference call) to discuss the Navy's August 14, 2015 letter. The Service informed the Navy that we were preparing a letter regarding the change in project description and updating the schedule for completion of the reinitiated consultation.

September 23, 2015: The Service sent a letter notifying the Navy that removal of conservation measures from the project description that provide reproductive benefits to the Newell's shearwater population is a change in the project description. The Service requested a joint meeting to discuss this change, the information needs arising from the change, and to identify collaboratively an updated schedule for addressing information needs for completing the consultation.

October 2, 2015: Adam Griesemer of the Service was notified via telephone by Zena Wetzel (a contract biologist for the Navy) that a dead Newell's shearwater was found near the Kokee Site C communication tower during monitoring surveys.

December 15, 2015: Mary Abrams, David Tessler, Aaron Nadig, and Adam Griesemer of the Service met with Aaron Poentis, Tamara Conkle, Cory Compora, Cynthia Nojima, April Teekell, and John Nelson of the Navy to discuss changes to the project description, information needs arising from this change, and to identify collaboratively an updated schedule for addressing information needs for completing the consultation.

March 25, 2016: The Service initiated a new evaluation addressing the effects of the proposed action on the Newell's shearwater based on the Navy's letter to the Service addressing additional information on the project description, including revised conservation measures that avoid and minimize impacts to the Newell's shearwater from project night lighting, and follow-up on the Service's suggestions regarding appropriate conservation measures for the Newell's shearwater.

August 29, 2016: Cory Campora of the Navy met with Aaron Nadig of the Service via telephone to discuss the schedule for completion of the reinitiated consultation. The Service and Navy agreed that once the draft biological opinion was completed, they would meet again to discuss the proposed action and updating the schedule.

July 26-27, 2017: Adam Griesemer, Aaron Nadig, Mary Abrams, Larry Salata, and Eric Hein of the Service met with Kelly Ebert, Tamara Conkle, Cory Campora, Frans Juola, and April Teekell of the Navy to discuss the Service's analyses informing the draft biological opinion such as the Service's deterministic population model, changes to the PMRF project description and conservation measures, interagency coordination, and action items necessary to complete the consultation.

August 28, 2017: Kelly Ebert of the Navy emailed the Service to provide notification of the Navy's intent to revise their biological assessment to include contributions to the Hawaiian Seabird Conservation Account managed by the Service and administered by the National Fish and Wildlife Foundation.

May 1, 2018: The Service received from the Navy a revised biological assessment for inclusion in the Navy and NNSA's reinitiation of formal consultation on the subject action.

July 26, 2018: The Service sent the Navy the draft biological opinion and requested comments.

August 3, 2018: Kelly Ebert of the Navy emailed the Service that the Navy would not finish comments on the draft BO until an unknown time the following week.

August 8, 2018: The Navy sent the Service their comments on the draft BO.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Navy's PMRF provides integrated range services for multiple Department of Defense (DoD) and NNSA activities. PMRF is the largest instrumented multi-environment weapons test range in the U.S. and includes land, sea, and air zones. The range services accommodate training, tactics development, and evaluation for air, surface, and subsurface weapons systems for DoD and other U.S. departments and agencies, foreign military forces, and private industry. PMRF maintains facilities and provides services to support Pacific Fleet underwater, surface, and air training exercises and other activities designed by the Chief of Naval Operations. The scope of the proposed action considered in this biological opinion includes all current and ongoing base infrastructure, operations, and maintenance activities at all terrestrial PMRF sites on the island of Kauai, including activities of tenant and customer DoD commands and other Federal agencies. The PMRF Main Base is located at Barking Sands, which has training and Research, Development, Test, & Evaluation (RDT&E) activity areas for tracing and surveillance radars, data processing, communications networks, and an airfield. In addition to the main base at Barking Sands, PMRF is comprised of support facilities on Kauai at Makaha Ridge (secondary range), Kokee (tracking radars, telemetry, communications, command, and control), Kamokala Ridge (munitions storage), Port Allen (pier for weapons recovery and Navy Seaborne Powered Targets (SEPTAR) boats), and Milolii Ridge (reflectors) (COMNAVREGHI 2010).

Although the Kauai Test Facility (KTF) previously included an area on Mount Kahili as a communications repeater site, the site is no longer used by KTF and all NNSA-owned telemetry and data acquisition equipment was removed. Mount Kahili will not be addressed further in this document.

The term of the proposed action is 50 years.

Components of the Proposed Action

i. *PMRF Main Base – Barking Sands*

Barking Sands is the principal operations area for PMRF and supports surface, subsurface, air, and space activities (COMNAVREGHI 2010). Tracking and surveillance radars, data processing, and other communications networks are contained within RDT&E activity areas. Nohili Ditch and Kinikini Ditch separate Barking Sands into three zones: north, central, and south (Figure 1).

The northern third of Barking Sands, north of Nohili Ditch, comprises KTF, an area managed and operated by NNSA's Sandia National Lab (SNL) for missile assembly and launch operations and associated support activities, administration, and services. SNL operates Sandia's Strategic Target System (STARS) and rail-launched sounding rocket launches from KTF. Within the NNSA *Work For Others* program, SNL also conducts missile launches for DoD components, including the Missile Defense Agency (MDA). KTF personnel conduct test operations to support materials research, components development, advanced re-entry vehicle technologies, water entry and recovery systems, and missile defense testing (www.sandia.gov/locations/ktf). Access to KTF, including the Nohili Dune area (the western boundary of KTF), is controlled and limited at all times. Polihale State Park, to the north of KTF, provides beach dune, camping, and surfing

activities to the public. Temporary closures of State of Hawaii access roads and beach areas at Polihale occur during missile launches from KTF.

In addition to housing KTF, the northern third of Barking Sands contains U.S. Army/MDA Terminal High Altitude Area Defense (THAAD) missile launch facilities, a 50K launch pad (capable of supporting a 50,000 pound maximum design load launcher), and the Aegis Ashore Test Center. As at KTF, beach and dune areas to the west of the THAAD, 50K, and Aegis launch facilities are off-limits to all PMRF personnel and visitors except for security personnel conducting patrols. Prior to missile launches from any launch pad, the Navy carries out security patrols to ensure no human presence in the Ground Hazard Area during launch activities (COMNAVREGHI 2010). During pre-launch and other patrols, security all-terrain vehicles (ATVs) are driven in non-vegetated areas between the high tide line and beach berm, and pickup trucks are driven only on existing dirt roads. Any security ATV entering the beach area is required to cross the berm only on designated permanent paths indicated by signage.

The central third of Barking Sands, delineated by Nohili Ditch on the north and Kinikini Ditch on the south (Figure 1), contains a 6,000-foot runway and associated air operations facilities. In addition to the runway, these facilities include a helicopter landing pad, main hangar, and administrative buildings. The airfield supports C-5 and C-17-type cargo aircraft, tactical aircraft, and helicopters. Operations support aircraft consist primarily of C-26 airplanes, which are used for logistics and range surveillance, and S-61 helicopters used for personnel transfer, logistics, surveillance, and target recovery. Daily touch-and-go practices of cargo airplanes also occur at the airfield. In addition to air operations facilities, the central third of Barking Sands supports base administration, base services, range operations, ordnance maintenance, and fuel supply facilities. The U.S. Army and Hawaii Air National Guard (HIANG) also maintain facilities and carry out missions in this section of the installation.

The southern third of Barking Sands, south of Kinikini Ditch (Figure 1), contains a housing area, personnel support facilities, and additional base operations facilities. Just to the south of Kinikini Ditch lies a recreational beach cottage area consisting of 19 cottages. The cottages are available for short-term rentals to active duty and retired military and their families and to DoD employees and contractors working on the installation. The cottages are adjacent to the beach, and the beach on this section of Barking Sands is open to use by military personnel and their families and beach cottage visitors. A breeding colony of Wedge-tailed Shearwaters (*Ardenna pacifica*) occurs in and adjacent to the beach cottage area. The southern third of the base also contains a housing area consisting of approximately 70 units (primarily single-family homes and duplexes), and personnel support facilities that include a Navy Exchange, fitness center, youth center, soccer field, movie theater, and all-hands club. A man-made oxidation pond is located in this section of the base, providing the only surface water on Barking Sands outside of the agricultural drainage ditches. Finally, this southern section of Barking Sands contains communications facilities, an antenna array, and launch facilities, although on a small spatial scale relative to the northern third of the base (COMNAVREGHI 2010). Barking Sands is surrounded by or contains a total of 6.3 miles of barbed wire fencing, consisting of 3-strand barbed wire atop chain link fence.

Figure 1. Map of the PMRF on Kauai (Source: COMNAVREGHI 2010).

a) Barking Sands Lighting

Night-lighting at Barking Sands is associated with base administration, maintenance, personnel support infrastructure, and missile assembly and launch facilities. Anti-Terrorism/Force Protection-lighting is used intermittently at Barking Sands missile assembly and launch facilities to protect personnel and assets prior to launch activities. Currently, three missile assembly areas and five launch pads are located in the northern section of Barking Sands, and a launch pad is located in the southern section of Barking Sands at Kokole Point. The total number of nights per year during which Force Protection lighting is required on these launch pads for all missile launch activities by all supported DoD commands and other Federal agencies is currently approximately 90-120 nights.

Duration of each event ranges from approximately three days to four weeks, and event schedules are spread out throughout the calendar year. Thus, the number of nights during the three-month nocturnal seabird fledging period (mid-September through mid-December) that require lighting at launch pads is not likely to exceed a total of 30 days.

b) Barking Sands Communication Towers and Transmission Lines

Fourteen communication towers are located at Barking Sands (Figure 2). In compliance with Federal Aviation Administration (FAA) and Commander, Naval Air Systems Command requirements regarding airfield obstruction-lighting, a subset of the communication towers at Barking Sands have aircraft obstruction-lighting at the top of the structure; this lighting consists of two steady-burning, unshielded red bulbs (DON 2018). The height and lighting of all communication towers at Barking Sands are presented in Table 1.

Table 1. General locations, heights, and lighting conditions of communication towers at Barking Sands, PMRF, as of September 2008.

Building/Site	**Type of Tower or Antenna**	**Tower Height**	**Aircraft Obstruction-Lighting**
Bldg 564	Metro tower	96 ft	2 red bulbs
Bldg. 515	Calibration lab antennas (2)	80 ft	2 red bulbs
Bldg. 556	Pyramid spiral antenna	40 ft	2 red bulbs
Bldg. 396	Aircraft beacon tower	66 ft	none
North Gate	HI Telephone microwave tower	165 ft	2 red bulbs
Bldg. 1100	Boresight tower	150 ft	2 red bulbs
North of Kokole Point	WWVH/U.S. National Institute of Standards and Technololgy radio antennas (2)	90 ft	none
North of Kokole Point	WWVH/U.S. National Institute of Standards and Technololgy radio tower	45 ft	none
Bldg. 851	Radial curtain antenna tower	110 ft	none
Bldg. 852	Radial curtain antenna tower	110 ft	none
Bldg. 853	Radial curtain antenna tower	110 ft	none
Bldg. 854	Radial curtain antenna tower	110 ft	none
Bldg. 822	Communications tower	110 ft	2 red bulbs
Bldg. 850	U.S. Coast Guard/Differential Global Positioning System tower	200 ft	2 red bulbs

In addition to communication towers, structures with narrow profiles exceeding 26 feet in height at Barking Sands include 121 electrical distribution line poles spread over a distance of approximately 7 miles. Unlike poles supporting 69 kilovolt (kV) transmission lines that run along the main roads of Kauai and stand 70 to 85 feet tall, the poles on Barking Sands support 12 kV distribution lines and are 45 feet in height. This height is within the range of heights of the kiawe trees (*Prosopis*

pallida) that dominate the non-native habitat on the base, including roadside habitat, that grow from 30 to 60 feet tall (COMNAVREGHI 2010 p. 3-51, http://www.ctahr.hawaii.edu/forestry/trees/CommonTreesHI/CFT_Prosopis_pallida.pdf). In addition, distribution lines on 45-ft poles throughout Barking Sands are configured in a horizontal plane, rather than stacked vertically, such that the vertical profile is equivalent to that of a single line. All existing communication towers and power lines at Barking Sands are in use, and there is no plan for removal of any towers or lines at this time.

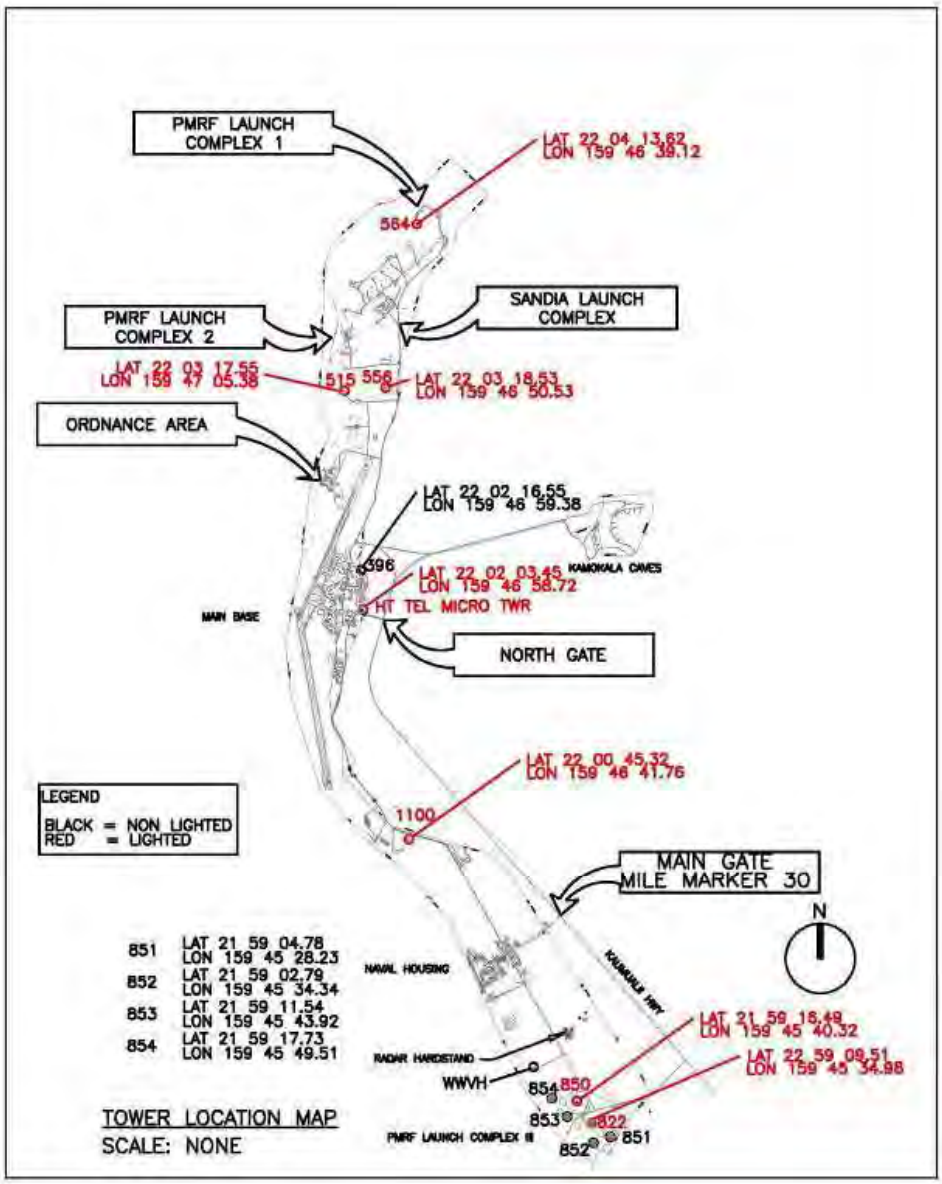

Figure 2. Locations of communication towers at Barking Sands, PMRF. Towers indicated by red font contain aircraft obstruction-lighting, consisting of two steady-burning unshielded red bulbs. Towers indicated by black font do not have lighting.

c) Barking Sands Air Operations and Bird-Aircraft Strike Hazard Program

Barking Sands air operations facilities in the central portion of the installation include a 6,000-foot runway, four helicopter landing pads, main hangar, and administrative facilities. The airfield supports military aircraft including, but not limited to, large cargo aircraft, tactical aircraft, and helicopters. Operations support aircraft consist of C-26 airplanes used for logistics and range surveillance, and S-61 helicopters used for personnel transfer, logistics, surveillance, and target recovery. Daily touch-and-go practices of cargo airplanes also occur at the airfield. Although field carrier landing practices (FCLPs) have not been conducted at the Barking Sands airfield, the potential exists for this training to occur. FCLPs are practices and tests of landing tactical aircraft at a land-based airfield for pilots who will land tactical aircraft on aircraft carriers. Pilots who are in the process of being assigned to aircraft carriers forward-deployed in the western Pacific normally conduct FCLP training on the west coast of the mainland U.S. The airfield at Barking Sands would be used for FCLP training and testing only if a pilot were unable to test on the mainland U.S. prior to travel to the western Pacific due to scheduling reasons.

To minimize the risk of aircraft collisions with birds and other wildlife, the Commander, Naval Installations Command (CNIC) contracts United States Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) Wildlife Services (WS) to implement an integrated wildlife control operation within the Bird Aircraft Strike Hazard (BASH) zone at Barking Sands. Control methods include lethal techniques for introduced species such as zebra doves (*Geopelia striata*), spotted doves (*Spilopelia chinensis*), mynas (*Acridotheres tristis*), bulbuls (*Pycnonotus* spp.), and manakins (*Lonchura* spp.). Lethal control is conducted via shooting in high probability bird-strike zones along the runways and taxiways. With non-listed species that are federally protected under the Migratory Bird Treaty Act (MBTA), USDA-WS conducts non-lethal control, including non-lethal trapping/relocation and hazing by personnel on foot or in vehicles. MBTA-protected species managed at Barking Sands include, but are not limited to, Laysan albatrosses (*Phoebastria immutabilis*), great frigatebirds (*Fregata minor*), and Pacific golden plovers (*Pluvialis fulva*). PMRF Air Operations maintains a Migratory Bird Permit for management of MBTA-protected species within the BASH zone. Newell's shearwaters are not hazed and personnel authorized to conduct BASH operations are trained in seabird preparedness in the event staff discover grounded seabirds.

d) Makaha Ridge Tracking Station

The Makaha Ridge Tracking Station serves as PMRF's secondary missile tracking and surveillance station (COMNAVREGHI 2010, pp. 4-1 – 4-2). Structures at the site consist of eight buildings and two antennas attached to telephone poles (Kleidosty Pacific 2016, p.30-31) (Figure 3). Tracking and surveillance activities occur inside the buildings at Makaha Ridge, including a Frequency Interference Control building, telemetry building, communications building, laboratory, power plant, maintenance facility, and guard shack. Access to Makaha Ridge Tracking Station is limited to assigned personnel and visitors on official business (COMNAVREGHI 2010, pp. 4-1 – 4-4).

Exterior security lights on buildings at Makaha Ridge are currently unshielded or partially shielded by roof overhangs. In compliance with FAA and Commander, Naval Air Systems Command requirements, the two antennas at this site each have steady-burning, unshielded red bulbs (DON 2018). Transmission lines at the Makaha Ridge site consist of 12 kV distribution lines at a height

of 45 feet along a total distance of 0.6 miles. Makaha Ridge contains 0.17 miles of barbed wire fencing, consisting of three-strand barbed wire atop a chain link fence.

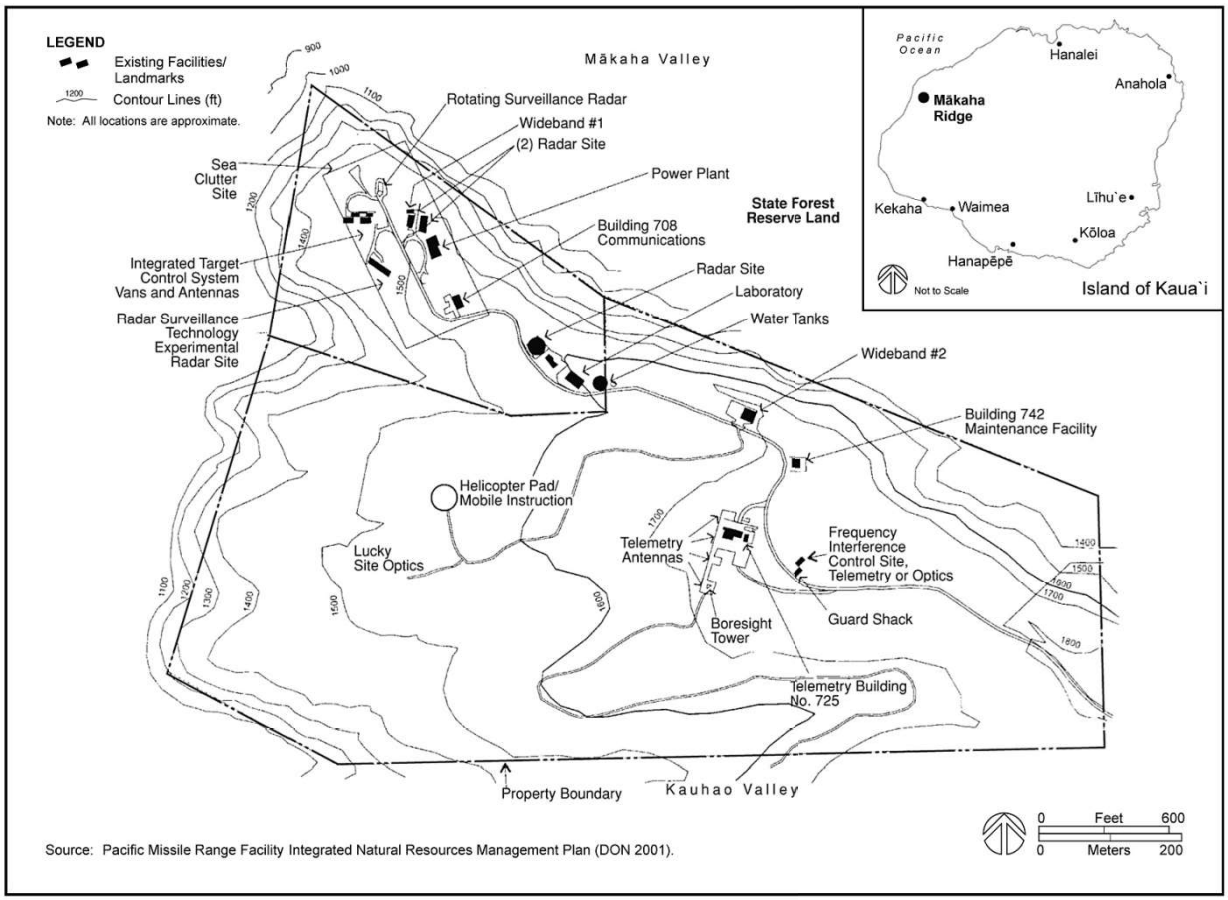

Figure 3. Map of Makaha Ridge site, PMRF, Kauai (Source: COMNAVREGHI 2010).

e) Kokee Sites

The PMRF Kokee sites contain four Navy-operated and maintained buildings in which telemetry, tracking, communications, and command and control operations occur (Kokee Sites A through D, Figure 4). A Geophysical Observatory operated by the National Aeronautics and Space Administration (NASA) is also located at the Kokee sites (Site E, Figure 4). Kokee Site A accommodates tracking and command, training and administration, and logistics support. Site B contains a power plant and fuel storage facility. Site C consists of boresight equipment, operations and maintenance support, a microwave antenna, and radar, and site D contains a transmitter building and antenna support facilities (COMNAVREGHI 2010, pp. 5-1 – 5-3). Although the US Air Force Station (USAF) and the PMRF Kokee sites are both located in northwestern Kauai in Kokee State Park (Figure 5), the sites are the not the same and the USAF is responsible for compliance for their operations at the Kokee Air Force station as described in the USAF Biological Assessment (USAF 2016).

Kokee Site A contains only two exterior security lights operated via motion sensors; lights are off unless motion is detected. Site B has no exterior lights. Site C contains a guard shack with an unshielded exterior security that was turned off beginning in October 2015, and site D has no

exterior lights. The NASA site (Site E) has four facility lights: two low wattage lights that remain on and two unshielded lights turned on by personnel as needed on infrequent occasions where they must be present at night. No above-ground transmission lines occur on the PMRF Kokee sites. The sites contain a total of 0.03 miles of barbed wire fence, consisting of three-strand barbed wire atop a chain link fence.

Two lattice-support communication towers are at Kokee Site C. Each tower has an unshielded steady-burning red light as per FAA and Commander, Naval Air Systems Command requirements. The communication towers are each 110 feet in height. Approximately 100 feet of each tower is exposed above the surrounding vegetation level. Communication Tower 764 has 28 guy wires.

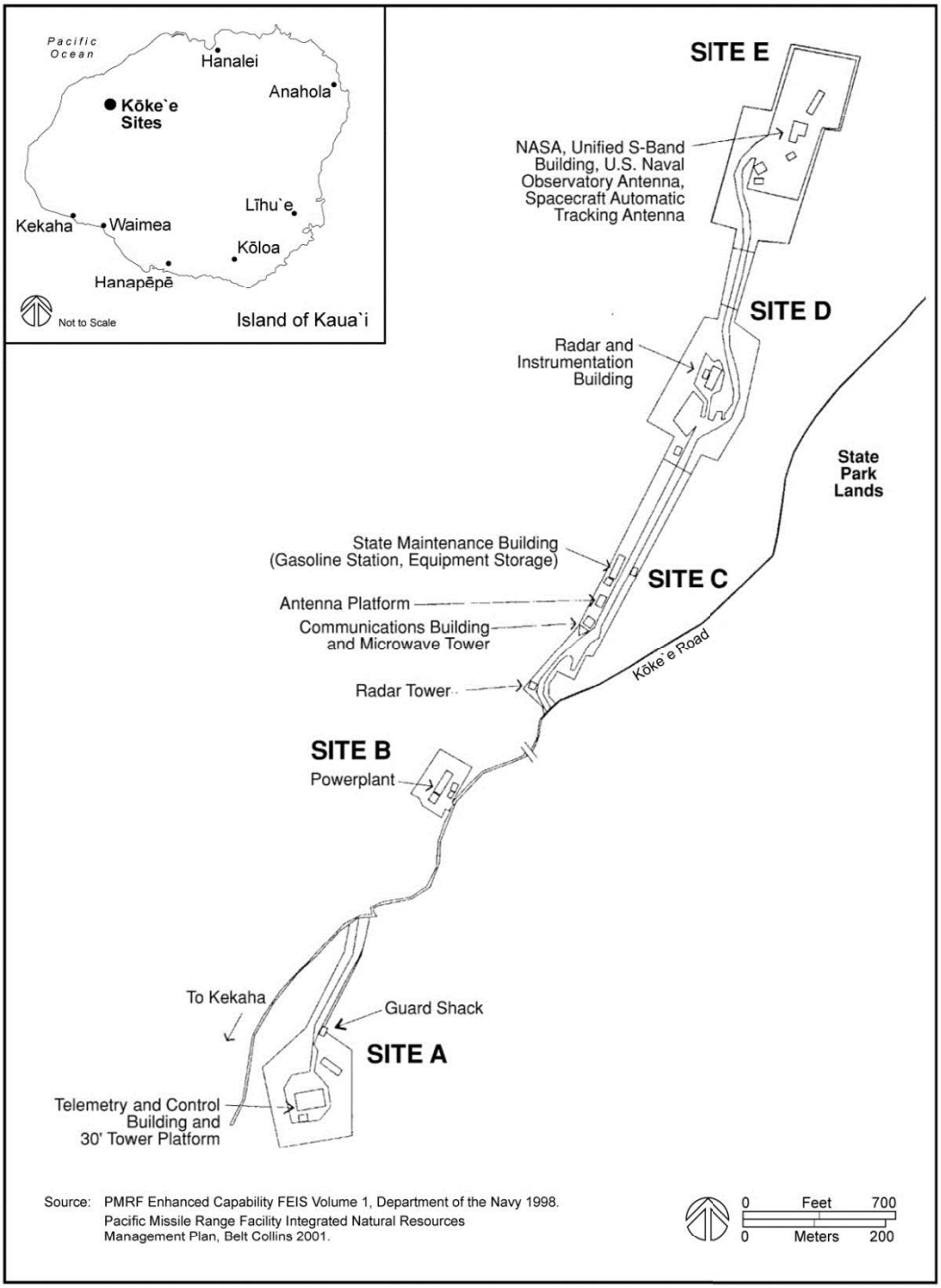

Figure 4. Map of PMRF Kokee Sites on Kauai (Source: COMNAVREGHI 2010).

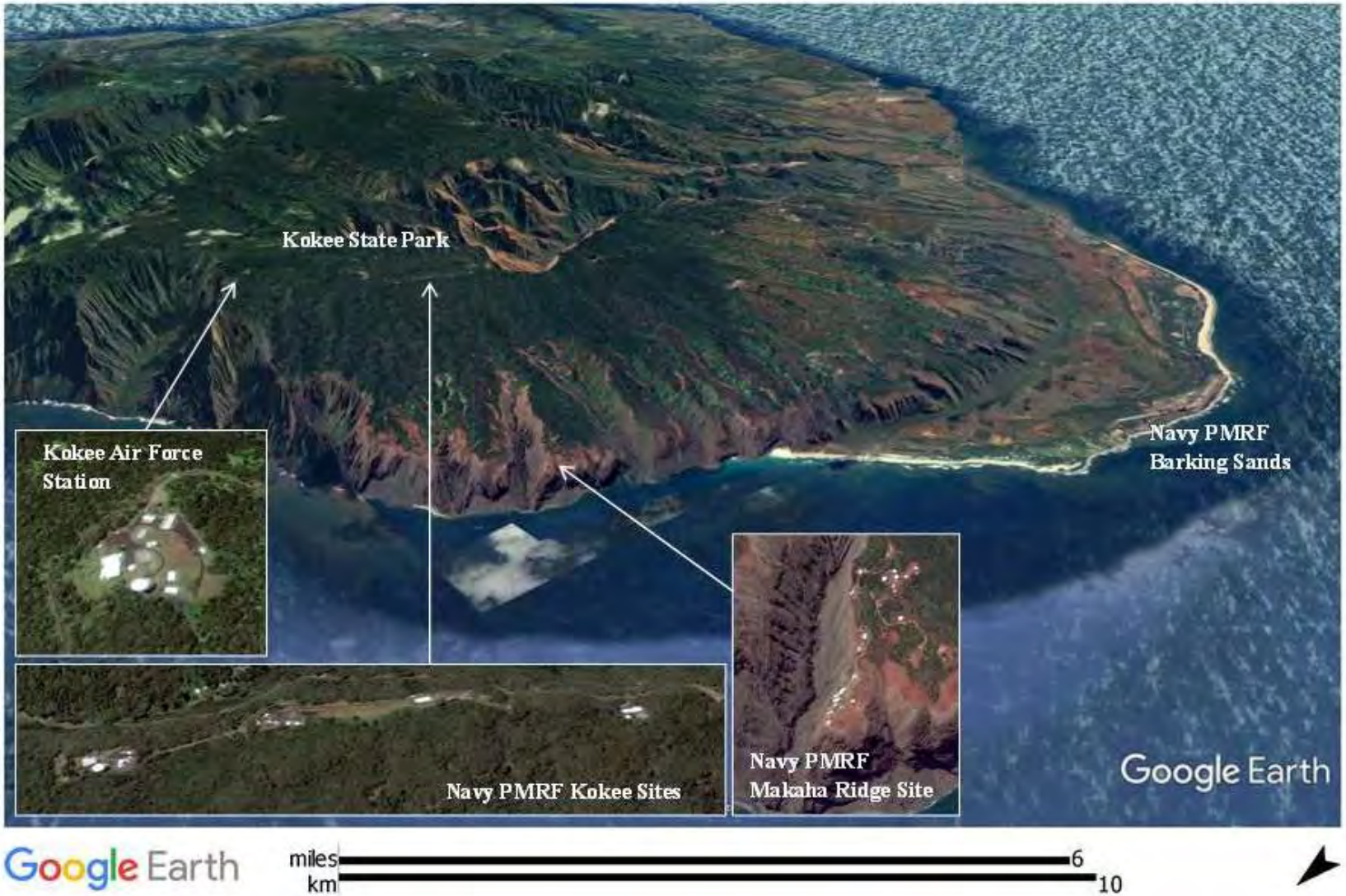

Figure 5. Three-dimensional view of Kauai with approximate locations of PMRF Kokee Sites and Kokee Air Force Station in Kokee State Park, PMRF Makaha Ridge Site, and PMRF Barking Sands. White shapes in zoomed views are buildings. Imagery from Google Earth, data SOEST/UHM and USGS, 2016 Digital Globe.

f) Kamokala Ridge Magazines

The Kamokala Ridge Magazines are located east of Barking Sands (Figure 1). Facilities at the site consist of two earth-covered magazines, 10 ordnance storage magazines excavated into the cliff face, and a missile assembly building. Ordnance is stored for the Navy, HIANG, DOE, and intermittently for other military commands with training and ordnance storage requirements (COMNAVREGHI 2010, pp. 6-1 – 6-2).

Per Navy instruction regarding security lighting for conventional arms, ammunition, and explosives (DON 2003), exterior lighting includes three floodlights on each of the two earth-covered magazines and a single incandescent bulb over the doorway of each of the 10 excavated magazines. This site includes 0.33 miles of barbed wire fencing, consisting of three-strand barbed wire atop a chain link fence.

g) Port Allen

At Port Allen Boat Harbor, the Navy leases the west side of the pier and pier building from the State of Hawaii. This site provides berthing facilities for three weapons recovery boats and a building for warehousing and support facilities including communications, maintenance/repair, and engineering.

Exterior lighting is required at the pier at Port Allen for Anti-Terrorism/Force Protection purposes (DON 2007) and to minimize nighttime trip and fall hazards near the water. Eleven lights are mounted under the roof overhang on the west side of the building, and one light is mounted on the front of the building (the northwest corner). The light on the front of the pier building is owned and operated by the Navy. The eleven lights along the west side of the building are operated by Navy, but the light fixtures are State property. These lights are turned on each night for security camera lighting and safety purposes. Six higher-intensity lights are turned on only during rare/infrequent occasions when personnel are working on docked boats on nights when fueling or upload/offload of equipment occurs. The site contains 0.05 miles of barbed wire fencing, consisting of three-strand barbed wire atop a chain link fence.

h) Miolii Ridge

The Miolii Ridge site is comprised of three, small 10-foot 2 reflector areas. No facilities are located at the site.

ii. *Conservation Measures to Minimize Impacts of the Proposed Action*

The following mitigation measures were developed by the Navy through consultation with the Service, are considered part of the proposed action, and are intended by the Navy to minimize adverse impacts to the Newell's shearwater that are directly related to the proposed action. These include measures that have been implemented at PMRF prior to initiation of this consultation.

a) Nocturnal Seabird Protection Program. The following measures are described as the nocturnal seabird protection program:

- All unnecessary exterior lighting will be turned off during moonless nights and shoulder nights during the seabird fledgling season. For example, in the 2016 seabird fledgling season, this measure was implemented during the seven nights prior to and eight nights following the September 30th new moon, the 10 nights prior to and eight nights following the October 30th new moon, and the eight nights prior to and two nights following the November 29th new moon;
- Full cut-off fixtures will be used where security or safety concerns require night lighting;
- Staff will patrol to confirm any exposed lights during the night are truly required and meet the shielding requirements;
- Base-wide predator control will be implemented to enhance survival and minimize the risk of predation to any downed seabirds on the installation;
- Monitoring will be implemented for downed seabirds on the installation during the seabird fledging season;
- Support will continue for a seabird collection station at the Main Gate entrance to Barking Sands for the SOS program;
- Recovered downed seabirds found at PMRF and will be placed in the seabird collection station at Barking Sands or transported to Kauai Humane Society, where the SOS program is housed; and
- Brochures will be distributed at Barking Sands to further increase personnel and visitor awareness of on-base seabird protection measures.

b) Early Planning and Scheduling

The installation commander has issued a notice (PACMISRANFAC NOTICE 10570 dated September 15, 2017) that gave guidance on measures to be implemented to reduce/eliminate risk to protected seabirds during the fledging season. Over the past 8 years, 93 percent of Newell's shearwater fallout has occurred between 12 October and 8 November (DON 2018). A calendar has been developed to overlay the moon phases with the shearwater fledging season to identify potential periods of higher risk such as nights of dark moon phases within the historical peak fallout period during previous fledging seasons. The Navy will minimize risk by scheduling non-time sensitive night operations outside the peak of the seabird fledging season to the extent practicable. It is estimated that operations would not be able to avoid the dark moon phases during the fledging season an average of once per year. In the future, there may be more flexibility in scheduling operations outside the dark moon phases as planning for operations can occur more than two years in advance.

c) Night-time Lighting Inspection

The Navy will conduct a night-time lighting inspection prior to the start of the seabird fledging season to confirm that the minimization measures regarding lighting are being followed and to identify potential risks that may not have been previously identified and addressed.

d) Parking Lot Lighting

During the seabird fledging season, lighting in the Aegis Ashore parking lot and other parking lots will be turned off with the exception of the shielded light at the Public Works parking lot,

and would only be temporarily lit for safety or special uses. Back-in parking will be required in parking lot stalls facing the ocean.

e) Interior Lighting

The Crash Fire Garage door is usually kept open to minimize response times in case of emergency. The Navy will reduce the interior garage lighting to the minimum required for fire crews to perform their work during the seabird fledging season. For other facilities such as hangars, exterior lighting will be minimized and bay doors will be kept closed as much as possible during the seabird fledging season.

f) Guideline for Implementation of Conservation Measures

Based on an analysis of seabird fallout trends over the past few years, the Navy has identified the change in personnel involved in implementing conservation actions as a contributing factor to the unexpectedly high fallout during the 2014 fledging season. The Navy has prepared draft guidelines to provide clarity and continuity in implementing biological opinion-associated conservation measures. These guidelines will clarify roles and responsibilities, point of contact information, minimum coordination and communication strategies, and documentation and reporting procedures for successful implementation of the biological opinion-associated conservation measures. In addition, a schedule describing the type of training and coordination planned, the target audience, and sample training materials will be maintained in the appendices of the guideline document. The document is a guideline instead of a traditional Standard Operation Procedure because it is intended to be a living document that can be adapted to maximize effectiveness as the program evolves.

g) Command Duty Officer Smartbook for Environmental Response

Additional guidance materials have been added to the Command Duty Officer (CDO) binder to provide immediate guidance to the CDO on duty.

h) Conservation Measures Pursuant to ESA Section 7(a)(1).

The following conservation measures were developed by the Navy through consultation with the Service to fulfill the Navy's ESA Section 7(a)(1) responsibilities for having an impact on Newell's shearwater.

The Remotely Piloted Air Vehicle (RPAV) Project
Navy has funded a project, in collaboration with the Hawaii Department of Land and Natural Resources (DLNR) Kauai Endangered Species Recovery Project (KESRP), to use a RPAV and ornithological radar to map flight paths and document nesting locations of Hawaiian Petrels (*Pterodroma sandwichensis*) and Newell's shearwaters on Kauai. As part of this project, KESRP has been subcontracted to ground-truth colony locations based upon RPAV data. If the RPAV does not successfully identify colony locations, KESRP will undertake nest monitoring in currently-known colonies as part of this project. This work was funded by the Navy in FY13 at $250,000.

KESRP Field Assistant
The Navy provided a full-time Endangered Seabird Field Assistant to the Hawaii DLNR KESRP for four months in 2012 (15 May through 15 September). This position was funded by the Navy at a total of $28,000. The Navy also funded KESRP in the summer of 2013 to conduct nest monitoring in currently-known Newell's shearwater colonies on Kauai at a funding level of approximately $40,000.

Seabird Conservation Account
The Navy proposes to contribute to the Hawaiian Seabird Conservation Account managed by the Service and administered by the National Fish and Wildlife Foundation in exchange for transfer of liability of further compensatory mitigation actions and to receive credits to offset the anticipated impacts to Newell's shearwater from the proposed action. Funds will be used to contribute to conservation of the species through management of seabird breeding colonies. Management may include removal of non-native predators, such as rats (*Rattus spp.*), feral cats (*Felis catus*), pigs (*Sus scrofa*), and barn-owls (*Tyto alba*), and restoration of occupied seabird breeding habitat. Partners implementing the management will demonstrate effectiveness through monitoring to detect the number of predators present and the number removed at the seabird breeding colony(ies) receiving the management.

In 2022, the Navy will coordinate with the Service to reevaluate their action of contributing to the Hawaiian Seabird Conservation Account and the effectiveness of the management implemented at the seabird breeding colony(ies). The Navy's contributions are anticipated to support, annually, management for 30 breeding pairs in 2018 and expanding management to affect 50 breeding pairs by 2022. Unless the Navy and Service reinitiate consultation based on the 2022 evaluation, the Navy's funding contributions to the Hawaiian Seabird Conservation Account will continue in years after 2022 at a level supporting, annually, the management of 50 breeding pairs.

iii. Annual Reporting on Conservation Measures

The Navy will submit annual reports detailing the implementation of the above Conservation Measures used to minimize the effects of the action. Annual reports will also summarize survey and monitoring results and levels of take of all ESA-listed species. The first report will be submitted at the end of the first fiscal year following BO issuance.

Action Area

The action area of a project is defined by regulation as all areas [likely] to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). The action area for this action (Figure 6) includes the main base of PMRF, known as Barking Sands, and all of Mana Plain, which surrounds Barking Sands, because this area is likely to be subject to above ambient light and noise levels associated with launches and aircraft operations. In addition to Barking Sands and the surrounding Mana Plain, the action area (Figure 6) is also comprised of several smaller sites located at Makaha Ridge, Kokee, Kamokala Ridge, and Port Allen that will also be subject to above ambient noise and light levels caused by Navy operations. Lastly, the action area also includes the western region of the island, from

Waimea Canyon through the Na Pali coast (Haena, Kokee, and Polihale State Parks), which constitutes the areas affected by the action. Air operations and missile launch operations produce noise and/or are visible within the action area. The action area, encompassing the region west of Haena to Port Allen, constitutes approximately 40% of Kauai.

Details of the sites which encompass the action area are provided below, in part, based on descriptions found in the draft BA, current conditions sections of the 2010 PMRF INRMP (COMNAVREGHI 2010). Additional details including maps and pictures of each PMRF site are provided in the 2010 PMRF INRMP.

Barking Sands is located along the Mana Plain on the western coastline of Kauai (Figure 6). The base is approximately 7 miles long and 0.5 miles wide, encompassing approximately 2,060 acres. Barking Sands is bordered to the north by Polihale State Park and to the south by Kokole Point. Barking Sands is bordered to the east by agricultural lands, which continue across the Mana Plain to the mountains of central Kauai. Barking Sands is bordered to the west by the Pacific Ocean, with a coastline dominated by sand beaches, beach barrier dunes, and beach strand vegetation. The Nohili Dunes provide the highest elevation at Barking Sands, approximately 100 feet. The drainage ditches constitute most of the surface water within Barking Sands.

Mana Plain extends across coastal leeward Kauai (Figure 6) and is bordered by Puu Ka Pele Uplands to the east, including Makaha Ridge, Na Pali coastline to the north, and Pacific Ocean to the west and south. Mana Plain once contained expansive wetland habitats that supported a variety of native plant and wildlife species. Prior to its drainage and conversion to agricultural lands during the 1900s, approximately 1,700 acres of permanent, semi-permanent, and seasonal wetlands were present on Mana Plain.

Makaha Ridge is a finger ridge of the Na Pali coast which occurs on the west-northwest side of Kauai to the northeast of Barking Sands (Figure 6). The elevation at Makaha Ridge ranges from 1,460 feet at the cliff faces to 1,850 feet at the eastern perimeter. The site covers 244 acres and lies approximately 7 miles north of Barking Sands within State of Hawaii forest reserve areas. Steep slopes surround the station to the south, west, and north. Water drainage paths exist at the site; however, there are no perennial surface water features.

The Kokee sites of PMRF (Figure 6) occur along Kaunuohua Ridge near the northwestern terminus of Waimea Canyon. Kokee State Park borders the sites on all sides, and forested areas extend within the property boundaries. The Kokee sites are located on five small parcels that total 16 acres of land, which range in elevation from 3,710 to 3,800 feet. No surface water resources occur at the sites.

The Kamokala Ridge Magazines is located approximately 1.5 miles east of Barking Sands covering 89 acres on the western side of the ridge (Figure 6). Elevation of the site ranges from 240 to 320 feet. The ridge is located on the western edge of the Puu Ka Pele, an upland area with numerous valleys that are characterized by rock outcrops and lowland dry vegetation. The Mana plain extends to the west of Kamokala Ridge. There are no perennial surface water features at the site.

The PMRF Port Allen site is located in the town of Port Allen (Figure 6) on the southern shore of Kauai. At this site, the Navy leases the west side of the pier and west side of the pier building from the State of Hawaii. The total area of the leased site is 1.0 acre. Because the Navy does not have jurisdiction over the lighting conditions on the east side of the pier, owned and operated by the State of Hawaii, the action area is restricted to the Navy-leased property on the west side of the building and pier.

The Na Pali Coast in northwestern Kauai extends from Haena to Polihale State Park (Figure 6). The elevation along the coast ranges from sea level to 3,700 feet in Kokee. The Na Pali region is characterized as a coastal cliff formation with numerous upland finger ridges, precipitous cliffs, and deeply incised valleys. The elevation in the rim areas ranges from approximately 2,700 to 3,600 feet.

Waimea Canyon is located in the western region of Kauai (Figure 6) and is bordered by Puu Ka Pele uplands and Na Pali Coast to the west, Makaweli uplands to the south, and the Alakai High Plateau to the north. The elevation in Waimea Canyon ranges from approximately 100 feet up to 3,700 feet at the canyon rim. The Waimea Canyon is characterized by near vertical cliffs and dramatic valleys. Several streams flow into the Waimea River in the Waimea Canyon, including Poomau, Waiahulu, Koaie, and Waialae streams.

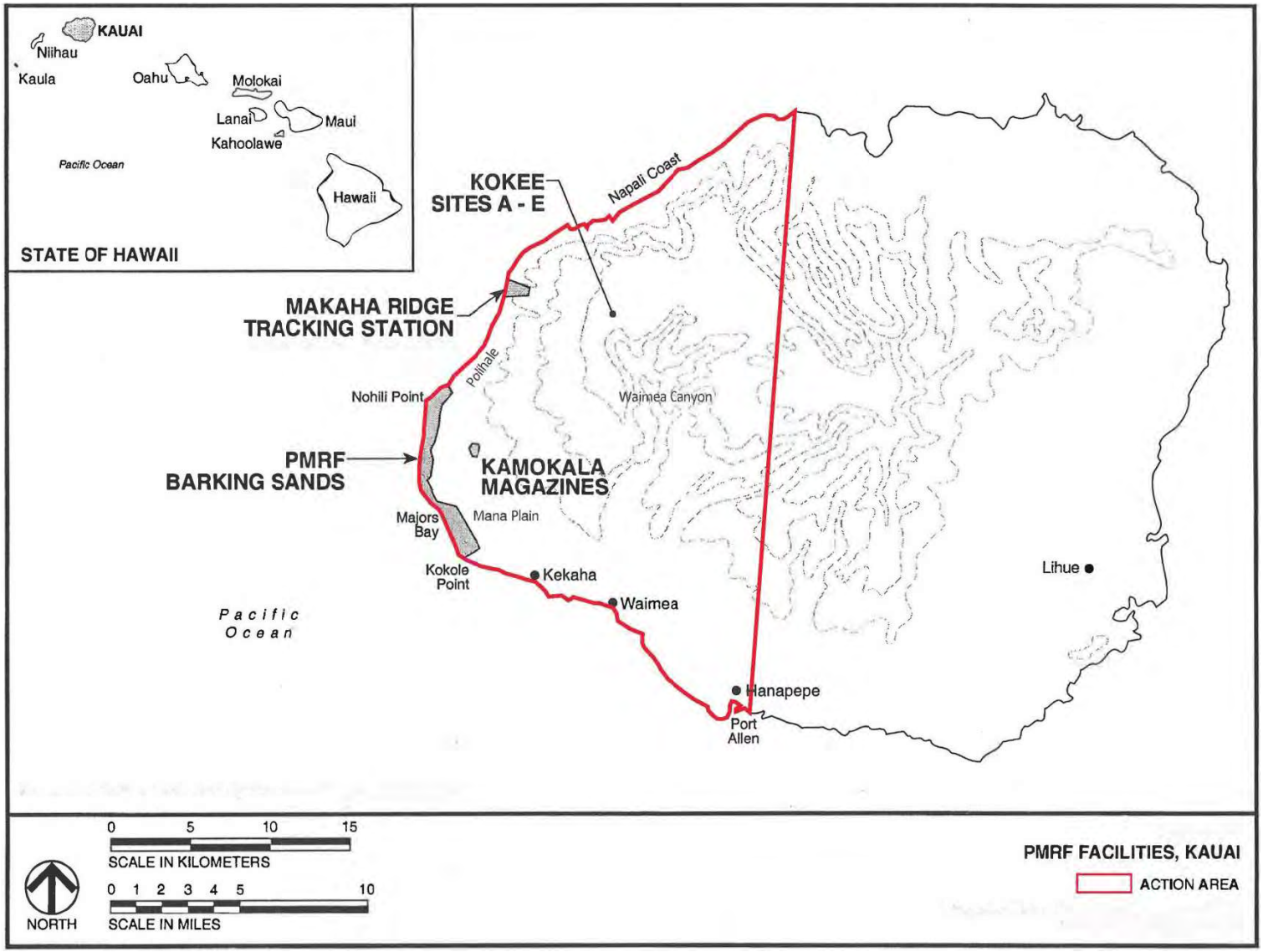

Figure 6. Map of action area for the proposed action on Kauai. Action area encompasses the area within the red border. (Source: COMNAVREGHI 2001).

ANALYTICAL FRAMEWORK FOR THE JEOPARDY DETERMINATION

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the Newell's shearwater range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the Newell's shearwater in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the Newell's shearwater; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the Newell's shearwater; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the Newell's shearwater.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the Newell's shearwater's current status, taking into account cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the Newell's shearwater in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the Newell's shearwater and the role of the action area in the survival and recovery of the Newell's shearwater as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

STATUS OF THE NEWELL'S SHEARWATER

i. Listing Status, Taxonomy, and Species Description

The Newell's shearwater was listed as a threatened species in 1975 (USFWS 1983), pursuant to the Endangered Species Preservation Act of 1966. *The Hawaiian Dark-rumped Petrel and Newell's Manx Shearwater Recovery Plan* was published in 1983 (USFWS 1983). Species five-year reviews on Newell's shearwater were completed in 2011 and 2017. Each of the reviews recommended up-listing the Newell's shearwater to endangered status primarily due to precipitous declines in the global population over the last two decades. Critical habitat has not been designated for the Newell's shearwater (USFWS 1983).

The Newell's shearwater taxonomically belongs to the *Puffinus* genus, in the *Procellariidae* family and *Procellariiformes* order, along with 20 other extant shearwaters ranging throughout the Indian, Atlantic, and Pacific oceans (Gill and Donsker 2016). Shearwaters are characterized by exhibiting a "shearing" flight pattern, dipping from side to side on stiff, straight wings with few wing beats. Genetic analyses conducted by Martíinez-Gómez *et al.* (2015) confirmed the taxonomic status of Newell's shearwaters (P. *auricularis newelli*) as a subspecies alongside the Townsend's shearwater (*P. auricularis auricularis*). These two subspecies comprise *P.*

auricularis. The two subspecies exhibit minor differences in plumage patterns and breeding chronology (Martíinez-Gómez *et al.* 2015, p. 1026). The Townsend's shearwater is endemic to the Revillagigedo Archipelago located off the coast of Mexico and south of Baja California Peninsula. The Townsend's shearwater's range and distribution has been significantly contracted to a single island with less than 100 breeding pairs remaining (Martíinez-Gómez *et al.* 2015, p. 1032; and BirdLife International 2016a).

The Newell's shearwater is approximately 12 to 14 inches long, with a wingspan of 30 to 35 inches (Berger 1972, p. 46), and weighs approximately 14 ounces (Ainley *et al.* 1997, p. 15). Its plumage is glossy black above, and white below (Ainley *et al.* 1997, p. 15). The Newell's shearwaters' maneuverability is characterized by fast, directional, and a low-to-water flight pattern, due to high wing-loading. A Newell's shearwater wing-loading averages about 60 N [newtons]/m2 (± 5.3 SD) with a low aspect ratio (10.3 ± 0.45 SD); significantly different from other shearwaters or petrels (Spear *et al.* 1995; Warham 1977). Observations of Newell's shearwaters transiting over land show a distinct flight pattern characterized by an almost frantic flapping style with the wings held straight (KESRP 2017). It has a dark gray to brown bill that is sharply hooked at the tip (Ainley *et al.* 1997, p. 15). Its claws are well adapted for burrow excavation and climbing.

ii. <u>*Historic and Current Distribution*</u>

The Newell's shearwater is believed to have colonized, historically, many of the southeastern Hawaiian Islands, including Hawaii, Maui, Molokai, Oahu, and Kauai (USFWS 1983, p. 2; Pyle and Pyle 2009, p.3). Newell's shearwaters were thought to be extinct after 1908, due largely to habitat loss and predation, but in 1954 a specimen was collected on the island of Oahu (King and Gould 1967) and in 1967 a breeding colony was found on Kauai (Sincock and Swedberg 1969). Although no Newell's shearwater breeding colonies have been identified on the island of Oahu, downed Newell's shearwaters have been recovered throughout the island since the 1950s (Pyle and Pyle 2009, p.3). Three fragmented breeding areas were identified in the Puna District on the southeast island of Hawaii in 1993, based on nocturnal calling, visual detections of birds in flight, and two Newell's shearwater carcasses found along the highway; however no active burrows were found (Reynolds and Ritchotte 1997, p. 31). Currently, research staff at Haleakala National Park on Maui Island consistently report Newell's shearwater ground calling within Kipahulu Valley and along the northern slope of Mount Haleakala near Koolau Gap, indicating a breeding site (NPS 2012, p. 18). However, due to sensitive resources in the area and the difficult terrain, no ground surveys have been conducted in these locations (NPS 2012, p. 19). In 2015, acoustic song meters were placed at 41 sites in remote areas of Haleakala National Park to detect potential new seabird breeding colonies (McKown and Savage 2015, p. 1). Song meters detected Newell's shearwater ground calls in low numbers (averaging 2 ground calls per survey night) at five of the 41 sites, with only one site recording regular activity during the 30-day study period (McKown and Savage 2015, p. 15). The song meters in this study were programmed to record 1 out of every 5 minutes, for 5 hours starting at sunset, then record 1 out of every 10 minutes for the 5 hours preceding sunrise (McKown and Savage 2015, p. 3). This schedule amounted to an hour and a half of data each night. Additional longer-term acoustic and ground surveys are needed to evaluate the extent, distribution, and viability of Newell's shearwater on Maui and Hawaii islands.

While some knowledge gaps remain concerning its distribution, the Newell's shearwater has experienced a significant breeding range contraction and currently, all known extant breeding colonies with documented burrows are located on the island of Kauai (Figure 7). Estimates indicate 90 percent of the global population resides on Kauai (Ainley *et al.* 1997; Griesemer and Holmes 2011).

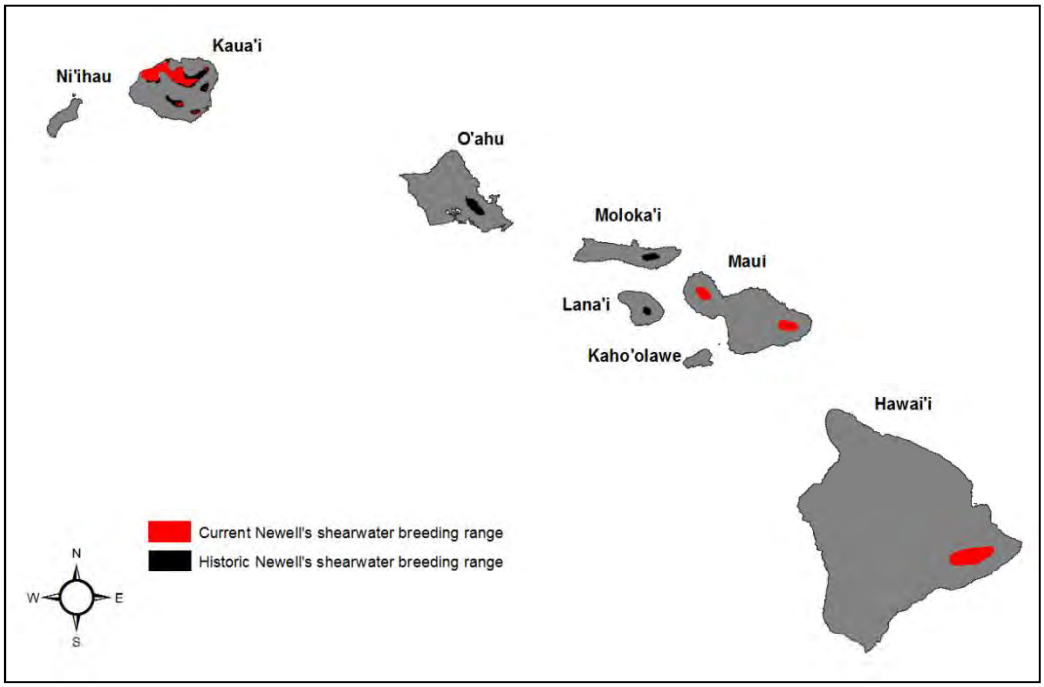

Figure 7. A comparison of the historic and current breeding range for the Newell's shearwater. Map shows current breeding range contraction from the historic breeding range for the Newell's shearwater within the Hawaiian Archipelago. While the Newell's shearwater may breed on Hawaii and Maui islands, the only known extant breeding colonies with documented burrows of Newell's are located on the island of Kauai.

Of the Newell's shearwater breeding on the island of Kauai, 104 breeding pairs were being monitored and an additional 64 burrows in Upper Limahuli Preserve were monitored in 2015 but could not be identified to species (i.e., burrows were either Newell's or petrels) (Raine *et al.* 2016a, 2016c). The majority of the monitored shearwaters (82 breeding pairs) in 2015 were concentrated within the Upper Limahuli Preserve (ULP), enclosed by an ungulate exclusion fence. Auditory surveys documented several additional areas of concentrated shearwater ground-calls indicating breeding activity within Lumahai Valley and Laau Mountain in montane habitat and within Honopu Valley along the Na Pali coast (Banfield *et al.* 2013). However, due to inaccessible and difficult terrain, no numbers or estimates exist for shearwaters breeding in these locations.

Based on historic and current distribution of breeding sites, Newell's shearwaters prefer breeding habitat in montane wet (e.g., Hono o Na Pali colony) to lowland wet and wet cliff (e.g., Upper Limahuli colony) habitat of 200m to 1,000m in elevation, steep to moderate slopes with thick native understory of uluhe fern (*Dicranopteris linearis*) and open canopy of dispersed ohia trees (*Metrosideros polymorpha*) (Troy *et al.* 2014, p. 325). The preference for montane forested

habitat beneath dense uluhe fern helps to conceal shearwater burrows from predators while dispersed ohia trees may provide a take-off point for shearwaters to regain flight (Troy *et al.* 2014, p. 318). The Newell's substrate preference includes rocky volcanic soils with a moderate amount of fine soil particles and suitable drainage to prevent burrow flooding (Troy *et al.* 2014, p. 324). Recent seabird surveys have resulted in the first confirmed Newell's shearwater burrows (n=3) along the Na Pali coast, in dry cliff habitat (Raine and Banfield 2015a, p. 11).

iii. *Life History*

Newell's shearwaters have a long lifespan (up to 36 years), do not reproduce until 6 years of age, lay one egg per year, and offspring require significant parental investment (Ainley *et al.* 2001). As with other k-selected species[1], these traits of long lifespans and low reproduction at high energetic cost define the life strategy of a species that has evolved in a stable, predictable environment, i.e. the succession of ecosystem development in the Hawaiian Islands following a period of volcanic eruptions.

Newell's shearwater breeding season begins in late March/early April when adults and sub-adults arrive to inland breeding colonies, followed by a 2-4 week exodus when breeding adults forage to build-up reserves (Raine and McFarland 2013a, p. 2; Raine and Banfield 2015a, p.2). The incubation period begins in May and continues through July, and the chick provisioning stage occurs in late July through September (Raine and McFarland 2013a, p. 2). Both sexes equally incubate the egg (Ainley *et al.* 1997, p. 10). The fledging or late chick rearing stage, when young leave the nest for the first time occurs in September through December (DOFAW 2018; Raine and McFarland 2013a, p. 2). Adults travel from breeding to feeding areas and return to feed their chicks irregularly every one to three nights throughout the chick rearing stage (Ainley *et al.* 1997). Newell's shearwaters, similar to other birds in the Order Procellariiformes, exhibit strong natal philopatry, with breeding pairs returning to the same burrow to breed each year (Bried *et al.* 2003, p. 242).

Ainley *et al.* (2001, p. 117) documented higher than expected numbers of active shearwater burrows with no egg or nestling signs present (11%-22%), indicating no breeding attempt was made. Monitoring data of shearwater colonies indicate at least 10% or more of activity within breeding colonies is comprised of non-breeding birds or sub-adults (<6 years old) prospecting for mates or excavating burrows during the breeding season (Raine *et al.* 2016a, 2016c). Ainley *et al.* (1997, p. 11) suggested shearwaters on Kauai begin returning to their breeding habitat as sub-adults at 2-3 years of age. The full shearwater breeding season is treated as March 1 to January 1 to cover the entire period when shearwaters may transit to and from the ocean and inland breeding sites (Travers *et al.* 2016, p. 5). All transit over land occurs in darkness, with a peak over land passage during the year coinciding with the late incubation and chick rearing stages (Travers *et al.* 2013, p. 35). Fledglings leaving the nest for the first time exhibit strong phototropic behavior and rely on ambient light from the moon to navigate to open ocean (Telfer *et al.* 1987, p. 410).

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[1] K-selected species are those characterized by long lifespans and low reproduction at high energetic cost due to their evolution in stable environments.

Newell's shearwaters are pelagic, spending much of their time foraging over deep waters where 96 percent of their diet consists of cephalopods, primarily the Ommastrephidae family of flying squid with the remaining 4 percent consisting of flying fish (*Exocoetus* sp.) (Ainley *et al.* 2014, p. 70). Newell's shearwaters likely specialize in feeding over yellowfin tuna (*Thunnus albacares*), as both flying squid and flying fish are important in the diet of yellowfin tuna.

iv. *Current Population Demographics*

At-sea surveys conducted in the central and eastern tropical Pacific between 1980 and 1994 (Spear *et al.* 1995) estimated the total Newell's shearwater population at 84,000 (95% CI = 57,000-115,000) including juveniles and sub-adults. An updated assessment based on survey data collected by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA-NMFS) Southwest and Pacific Islands Fisheries Science Centers from 1998 to 2011, estimated the total Newell's shearwater population at 27,011 (95% CI = 18,254-37,125) including juveniles and sub-adults (Joyce 2013). Given 90 percent of the global population resides on Kauai (Ainley *et al.* 1997; Griesemer and Holmes 2011), the estimated population of Kauai is 24,310 individuals (USFWS 2017b, p. 113). The percentage of the population that is breeding age (6 years of age or older) is estimated at 0.637 (Ainley *et al.* 2001, p.115), equaling an adult population size of 15,485 (approximately 7,500 pairs).

Annual survivorship and juvenile/sub-adult survivorship of the Newell's shearwater has not been studied in the field (i.e., estimated from banding efforts and recapture). Population viability modeling efforts estimate Newell's shearwater adult survivorship at 0.905 (Ainley *et al.* 2001, p. 116) to 0.920 (Griesemer and Holmes 2011, p. 20; USFWS 2017b) and juvenile/sub-adult survivorship at 0.333 (Ainley *et al.* 2001, p. 116) based on long-term survivorship data of related species. The likelihood of Newell's shearwater adults (≥ 6 years of age) to breed in any one year was estimated to vary between 0.60 and 0.50 (Ainley *et al.* 2001, p. 118), which is markedly lower than the breeding probability (0.82) of other Procellariidae species. Based on a five-year monitoring study of a single Newell's shearwater colony on Kauai the annual reproductive success of shearwaters was estimated at 0.66 fledglings per breeding pair (Ainley *et al.* 2001, p. 117).[2] In comparison, the Manx shearwater, a closely related species with an extensive range and a stable global population has a reproductive success of 0.70 (Brooke 1990; and Ainley *et al.* 2001, p. 117).

Based on Newell's shearwater population parameters, SOS data, and carcass searches under power lines, Ainley *et al.* (2001) estimated the global population of Newell's shearwaters are declining at least 5.9 percent per year (λ=0.941). Ainley *et al.* (2001, p. 118) found that the main factor limiting the population growth rate of the Newell's shearwater was the extremely low breeding probability (0.547), which is associated with individual fitness and habitat quality. Ainley *et al.* (2001) suggested that the low breeding probability could be the result of high mate loss due to predation or other threats affecting individual fitness. Indeed, adults that lose a mate due to predation cannot obtain a new one quickly and have been observed not to breed the

[2] Reproductive success is defined as the number of chicks fledged from active burrows (Ainley et al. 2001).

following season (Ainley *et al*. 2001, p. 118). The purpose of the Ainley *et al.* (2001) population demographic study was to evaluate the status of Newell's on Kauai. The study sampled an average of 65 burrows for seven seabird seasons, 1981–1985 and 1993–1994. The colony sampled was in a natural state (i.e., receiving no conservation management actions) and the sample was not constrained to only experienced breeders, but rather sought to maximize the total number of burrows monitored each season (Ainley *et al.* 2001, p. 112).

Ornithological radar data was first used to monitor populations of Newell's shearwaters and Hawaiian petrels on Kauai in 1992-1993 (Day *et al.* 2003, p. 670), based on methods developed to monitor marbled murrelet (*Brachyramphus marmoratus*) populations in the Pacific Northwest (Cooper *et al*. 2001). Radar has been used to monitor the summer movement patterns of Newell's shearwaters and provide an accurate estimate of birds as they transit through the detection area at 13 sites throughout the island (Day and Cooper 1995; Raine *et al.* 2017). Day *et al.* (2003) reported a mean annual rate of 11.2 percent decline in the Newell's shearwater population between 1993 and 2001, based on the analyses of ornithological radar data.

A subsequent study using visual observations, species-specific timing of petrel and shearwater movements, and radar data analysis showed an appreciable reduction in the number of shearwaters transiting to and from montane breeding colonies from 1993 to 2013 (Raine *et al.* 2017), updating the analyses presented in Day *et al.* (2003). Radar surveys were conducted in coastal areas of known seabird flyways in May through mid-July, during the incubation and early chick-rearing stage. Therefore, these radar data are a conservative index of breeding activity. The overall mean for shearwaters across all 13 radar sites surveyed in 1993 was 524 ± 207 targets/h and in 2013 was 34 ± 9 targets/h, representing a mean decrease of 94% between the two periods ($t = 2.37$, $P = 0.03$; Raine *et al.* 2017). All of the 13 sites showed a large decrease in movement rates over the entire period, with movement rates at 12 (92%) out of 13 sites showing statistically significant declines (Raine *et al.* 2017). Based on the radar data (Raine *et al.* 2017) as a proxy for the breeding population, the Newell's shearwater population on the island of Kauai declined, annually, at a mean rate of 12.5 percent over the 20-year period. This updated rate of decline of the Newell's shearwater population is comparable to the mean annual rate of -11.2 percent between 1993 and 2001 reported by Day *et al.* (2003, p. 673).

Ainley *et al.* (2001) had documented 14 shearwater breeding colonies distributed across Kauai (Figure 8). Several of these formerly large Newell's shearwater colonies in Kalaheo, Kaluahonu, and Makaleha on the island of Kauai have declined dramatically in recent decades to near extirpation (Raine *et al.* 2017). No population data exists for Newell's breeding on other islands.

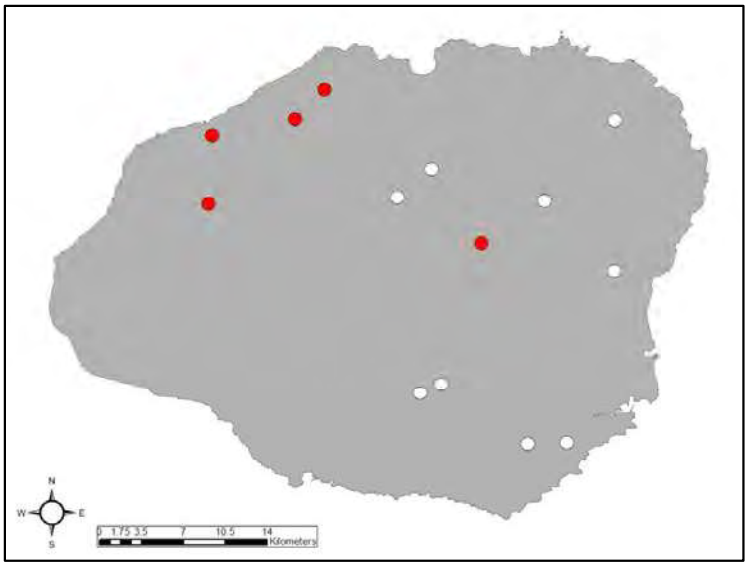

Figure 8. Map of Kauai showing Newell's shearwater breeding colony locations (n=14) (Ainley *et al.* 2001); unfilled circles (n=9) represent colonies near extirpation (<5 burrows).

In two breeding colonies on Kauai, ULP and Hono o Na Pali Natural Area Reserve (NAR), efforts are currently underway to curtail the population decline through the removal of predators. The reproduction output of the 104 monitored Newell's shearwater pairs breeding within these areas are measured in terms of their reproductive success.[3] Since 2011, the reproductive success of Newell's shearwater pairs within ULP has increased by 27 percent, from 0.692 to 0.882 in 2011 and 2015, respectively (Raine *et al.* 2016a, p. 16). This increase appears to be a direct result of the ungulate exclusion fence completed in 2010 and intensive predator control that began in 2011. Indeed prior to these conservation efforts, surveys at ULP documented a 0.545 reproductive success rate (Table 2). Newell's are less prevalent than petrels within Hono o Na Pali Natural Area Reserve (NAR) and have not been as successful in reproducing (Table 2) due primarily to predation by cats, rats and feral pigs, despite the ungulate exclusion fencing and predator control. In addition to the reproductive success rates from Newell's burrows listed in Table 2, there were an additional 162 burrows at ULP and Hono o Na Pali NAR monitored in 2015 that could not be identified to species (i.e., burrows were either used by Newell's shearwaters or petrels).

Table 2. Reproductive success rates for Newell's shearwater breeding pairs (*n*) monitored each year (2010–2015) at Upper Limahuli Preserve and Hono o Na Pali Natural Area Reserve's Pohakea site.

Year	**2010 (*n*)**	**2011 (*n*)**	**2012 (*n*)**	**2013 (*n*)**	**2014 (*n*)**	**2015 (*n*)**
ULP	0.545 (11)	0.692 (15)	0.682 (34)	0.784 (46)	0.840 (59)	0.882 (82)
Hono o Na Pali NAR-Pohakea	no data	no data	no data	0.571 (8)	0.375 (20)	0.667 (22)

[3] Reproductive success in Procellariformes, also commonly referred to in scientific literature as breeding success, is the percentage of eggs laid that result in young fledged (Warham 1996).

v. *Threats*

Primary threats to the Newell's shearwater include artificial nighttime lighting (Reed *et al.* 1985; Cooper and Day 1998), collisions with power infrastructure (Cooper and Day 1998; Podolsky *et al.* 1998), predation by introduced predators (Raine and Banfield 2015b, 2015c), and changes to breeding habitat due to introduced invasive plants (Troy *et al.* 2014). These threats to the Newell's shearwater have been steadily increasing.

Artificial light sources collectively are a significant mortality factor associated with Newell's shearwaters (Ainley *et al.* 2001; Troy *et al.* 2011). Upward projecting nighttime lighting interferes with the shearwaters ability to navigate to and from their breeding sites. Shearwaters, primarily fledglings and sub-adults are disoriented by nighttime lighting and will circle light sources until they become exhausted and fall to the ground, where these birds are vulnerable to being killed by feral cats, dogs, or vehicles (Travers *et al.* 2013, p. 81). They often fly into utility wires, poles, trees, and buildings and fall to the ground; this phenomenon is referred to as "fallout". Once these seabirds fall to the ground, they are unable to regain flight unless they have access to an area with sufficient take-off conditions to allow enough air to move under their wing to provide lift (Ainley *et al*. 2015, p.32). Since 1979, the State's Division of Forestry and Wildlife (DOFAW) on Kauai with financial assistance from the Kauai Island Utility Cooperative (KIUC) (beginning in 2003) has supported the Save our Shearwaters (SOS) program to collect "downed" Newell's shearwaters and Hawaiian petrels (*i.e*., birds that have either collided with structures or fallen out, or have been injured or killed due to exhaustion caused by light attraction). Over a 37-year period (1979-2016), the SOS program documented a total of 30,552 Newell's shearwaters recovered, injured or killed due to artificial nighttime lighting (DOFAW 2018). In the 1980s through 1990s, an average of 1,247 Newell's shearwaters were processed by the SOS program each year, where carcasses were documented or injured birds were rehabilitated and released (DOFAW 2018).

Adults and sub-adults are subject to collisions with power lines while flying between their nesting colonies and at-sea foraging areas (Cooper and Day 1998, p. 18; Podolsky *et al.* 1998, p. 21). Nestlings are indirectly affected as they rely on provisioning from both parents in order to survive, thus the loss of either parent results in nestling fatality. In 1993, in a single breeding season Podolsky *et al.* (1998, p. 30) documented deaths of at least 70 breeding adults and 280 sub-adult shearwaters over the summer months, in addition to 340 fledgling deaths in the autumn months, all as a result of collisions with power lines on Kauai. However, this study covered only the eastern and southern portions of the island (Podolsky *et al*. 1998, p. 30).

Based upon recent information collected from passive acoustic song meters (n=51) by KIUC Underline Monitoring Program, the Service has conducted modeling to extrapolate the amount of documented take (i.e., collisions with power lines) to the entire power system on Kauai (USFWS 2017b). The Service estimates that 1,800 Newell's shearwater mortalities are occurring per year as a direct result of power line strikes under the KIUC Short-Term Habitat Conservation Plan (STHCP) and Incidental Take Permit (ITP), using the rounded average of 2014 and 2015 strikes from scenarios IV, VB, and VIA selected in the USFWS Newell's Shearwater Landscape

Strategy Appendix 2 (2017b, p. 123)[4] This number is substantially greater than what was anticipated at the time the ITP was issued. The KIUC Short-Term Habitat Conservation Plan and Incidental Take Permit authorized the annual take of up to 162 Newell's shearwaters and 2 Hawaiian petrels (adults and sub-adults) from 2011 to 2016.

Introduced predators, particularly cats, rats, feral pigs, mongoose (*Herpestes auropunctatus*), and barn owls, are a severe threat to the continued existence of the Newell's shearwater. Adults, sub-adults, and young are susceptible to predation by these introduced predators (Raine and McFarland 2013b; Raine and Banfield 2015a, p. 38). These non-native predators occur throughout the Hawaiian Islands, with the exception of the mongoose, which has not established a breeding or viable population on Kauai (KISC 2018).

Another threat to the Newell's shearwater is habitat loss due to invasive vegetation. Invasive plants alter the three-dimensional structure of Hawaiian forests (Asner *et al.* 2008) as well as disrupt other ecological processes. A vegetation shift in areas of Kauai away from native understory to invasive vegetation, including but not limited to strawberry guava (*Psidium cattleianum*) and ginger (*Hedychium gardnerianum*) has been associated with at least one abandoned Newell's shearwater colony on Kauai (Troy *et al.* 2014). Extreme weather events such as hurricanes Iniki (1992) and Iwa (1982) have caused significant disruptions in forest habitat and, coupled with colonization of invasive plants, have resulted in permanent habitat loss for forest birds (Pratt 1994). In addition, areas of degraded habitat have facilitated the spread of invasive mammalian predators (Raine *et al.* 2016b, 2016c, 2016d). For example, in a heavily degraded habitat Ainley *et al.* (2001) counted 30 dead Newell's shearwater sub-adults and adults due to predation in one season (Ainley *et al.* 2001, p. 121).

Other threats include climate change and its affects to both seabird adult survivorship and recruitment (Sandvik *et al.* 2012) by generally affecting food availability (Oro 2014). Research by Spear *et al.* (2007) and Ainley *et al.* (2014) also indicate that Newell's shearwaters forage readily with yellowfin tuna and may be vulnerable to fishery interactions.

vi. <u>*Survival and Recovery Needs*</u>

For purposes of this biological opinion, the "survival condition" of the Newell's shearwater in the wild represents the level of reproduction, numbers, and distribution necessary to support a persistent population in the Hawaiian Archipelago that is fully protected by the ESA. For purposes of this biological opinion, the "recovery condition" of the Newell's shearwater is that where the threats to the species have been addressed such that the protections of the ESA are no longer necessary to insure the survival condition of the Newell's shearwater in the wild.

The recovery plan (USFWS 1983) for the Newell's shearwater does not contain recovery criteria; rather general goals are listed that require revision due to a substantial amount of new information. For example, the recovery plan (USFWS 1983, p. 22) calls generically for reducing

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[4] KIUC activities are also likely to cause take of Hawaiian petrels; however, updated estimates of annual petrel take levels are not described in this biological opinion.

annual SOS collected, lighting related fallout of Newell's shearwaters to less than 100 birds, and for developing efficient predator control methods to protect nesting sites.

In 2017, the Service finalized the *Newell's Shearwater Landscape Strategy* (USFWS 2017a). The Newell's Shearwater Landscape Strategy (USFWS 2017a) focuses on managing and enhancing extant colonies in areas with minimal light impacts, mitigating threats at the colony, and those encountered while in transit to the colony, and creating new colonies through social attraction and translocation (USFWS 2017a).

This strategy expands on actions completed by KIUC under the STHCP, including a predator-exclusion fencing feasibility study (Young and VanderWerf 2014) and the 2013–2014 Kauai island-wide auditory surveys to locate new shearwater and petrel colonies (Banfield *et al.* 2013; Raine and Banfield 2015b). The strategy describes general tools (i.e., manual predator control, ungulate and predator-exclusion fences) as well as translocation and social attraction activities to protect or augment existing breeding colonies and/or create new breeding colonies. Removing terrestrial predators (e.g. feral cats) that depress shearwater survival and establishing predator-free breeding habitat is required to successfully restore seabird colonies (Buxton *et al.* 2014; Jones and Kress 2012). On Kauai, repeated access into the colony to conduct intensive predator control in open systems can degrade sensitive vegetation, while predator ingress and predation remains constant. In montane habitat, manual predator control should be conducted as an incremental step towards the goal of constructing a predator exclusion fence culminating with predator removal or eradication.

Predator fencing is the most effective tool against mammalian depredation at the colony, particularly for indigenous species that are highly sensitive to predation (Young *et al*. 2013; Norbury *et al*. 2014). Within the current range of Newell's shearwater, topography, streams, and remoteness limit the number of sites and size of areas that can be protected with predator exclusion fences. Preliminary surveys of eight sites known to have Newell's shearwater populations identified three as suitable for predator fencing; the other five were eliminated because of topography or streams (Young and VanderWerf 2014). The KESRP continues to survey areas for Newell's shearwater activity so active sites suitable for predator fencing, in addition to those identified in the Newell's Shearwater Landscape Strategy, could be identified in the coming years. At a minimum, the two sites recommended by Young and VanderWerf (2014) with identified Newell's shearwater burrows should be fenced. The third site identified in this study was found to have only Hawaiian petrel burrows. Other sites located independently by KESRP and verified as occupied and suitable for fencing should be fenced. These sites should be protected using manual predator control until the fences are complete. To increase recruitment once fences are complete, social attraction should be a component of the project (see below).

The strategy prioritizes management efforts to occur in colonies already receiving conservation management actions under the existing KIUC STHCP, by relying on the concept of a 'no light conservation zone' or NLCZ to define an area which contains very little artificial nighttime lighting or light impingement. The NLCZ is based on the belief that artificial nighttime lighting is the primary factor constraining the distribution of Newell's shearwater breeding colonies and therefore colonies located in the NLCZ are more viable and should receive conservation actions.

The NLCZ encompasses the northwest corner of Kauai and includes coastal areas as well as mountainous steep terrain with a relatively small human population, resulting in minimal artificial nighttime lighting in the area. The NLCZ contains very little nighttime lighting currently, unfortunately there are no county ordinances or other mechanisms to support or require the continued existence of an NLCZ into the future. The strategy also calls for generally minimizing the effects from artificial nighttime lights and power lines.

In addition to this isolated area there is a need to generally address light attraction. Many sources of lights have already been modified to minimize attraction of fledging Newell's shearwaters, but a standard island-wide study is needed at regular intervals to identify new locations of concern for light attraction and those that might be out of compliance. A study is also needed to test the various types of LED bulbs available against the existing low pressure sodium bulbs to assess which is most suitable for seabirds. The results of this study should be used to determine which lighting configuration has the least impact on Newell's shearwaters and inform future recommendations on retrofitting lights, targeting the highest impact lights first. In the interim, problematic lights should be removed, turned off during the fledging season, reduced in intensity, or fitted with shields to direct the light toward the ground to minimize impacts.

The strategy does not comment on any elements (e.g., habitat requirements, genetic representation, and population resiliency) that would contribute to and define the long-term health needs of the Newell's shearwater population.

Population viability modeling efforts conducted by the Service defined Newell's shearwater adult survivorship at 0.92, based on a boxplot assessment and linear regression of adult survivorship data from proxy Procellariformes (USFWS 2017b, p. 122). Because the Newell's reproductive strategy has evolved to have a high adult survivorship, adult mortality is particularly harmful to the population. Left unchecked low adult survivorship (or conversely high adult mortality) will serve to depress the colony population to unsustainable numbers thereby increasing the vulnerability of these populations to invasive predators and other stochastic events (e.g., hurricanes damaging breeding habitat or climate shifts altering food availability).

The survival and recovery needs of the Newell's shearwater are described in the succeeding paragraphs based on components from the recovery plan and landscape strategy documents highlighted above, as well as the best currently available scientific information. The survival condition of the Newell's shearwater is the biological factors necessary for a persistent population. The survival condition of the Newell's shearwater will need to include over a generation time (i.e., 7-8 years), an annual and stable breeding probability of 0.80 and consistently high reproductive success levels of at least 0.85 fledglings per breeding pair, per season. In order to achieve these biological factors, immediate actions need to be taken to protect occupied breeding habitat from invasive predators by constructing predator-exclusion fences and concurrently increasing predator removal efforts around the two extant and accessible breeding colonies on Kauai (Upper Limahuli and within Hono o Na Pali). Once a predator exclusion fence is constructed and predators are eliminated within the fence, management efforts should incorporate social attraction techniques using acoustic and visual/olfactory cues (Buxton and Jones 2012) to lure prospecting non-breeders and sub-adults into the protected breeding

habitat. Current telemetry data shows that the Hono o Na Pali and Upper Limahuli colonies are minimally affected by power line collisions and artificial nighttime lighting based on actual flight paths (n = 9) to and from foraging areas and breeding habitat (Raine *et al*. 2016e, p. 24). The main land-based threats to the Hono o Na Pali and Upper Limahuli colonies are introduced predators and invasive vegetation.

Maintaining the ecological life-support systems (i.e., habitat requirements) for the two largest Newell's shearwater breeding colonies is critical to the long-term survival. Management of breeding habitat within predator exclusion fences should include invasive vegetation control during the non-breeding season to support a native understory and canopy and biosecurity measures to prevent introductions of invasive flora and fauna. The size of the predator exclusion fences in montane forested habitat will be dictated to some extent by the terrain, however each exclusion fence should contain the extant colony, anticipate and minimize erosion, and be large enough (≥10 ha) to encompass enough breeding habitat to sustain at least 1,500 active breeding pairs and small enough to be adequately maintained in perpetuity. Given these habitat requirements, the minimum "range-restricted" population necessary to retain the species potential for recovery is 3,000 breeding pairs (two colonies with 1,500 pairs each).

Survival of the Newell's shearwater cannot be predicated solely on the existence of two neighboring breeding colonies on a single island. The survival needs of the Newell's shearwater include reducing adult mortality occurring range wide due to the attraction to artificial lights and collisions with power lines. The data gathered from Travers *et al*. (2014) and Travers *et al*. (2015) have vastly improved our knowledge of the scope of the impact of power line collisions and have identified the power line segments, of those surveyed, that have the greatest impact on seabirds. Lines along Power Line Trail in the north central region of the island were responsible for 75 percent of the documented strikes in 2014 (Travers *et al*. 2015). This stretch of lines should be prioritized to be buried, lowered in height, modified such that the top lines are removed, re-directed after appropriate studies to assess minimization effectiveness, or made visible in some manner (e.g., through the use of lasers or bird diverters, both of which are being tested by KESRP). As additional stretches of lines are monitored each year, other high-impact zones will be identified and appropriate avoidance or minimization methods should be implemented. Reducing the impact of power lines is critically important to ensuring the continued existence of Newell's shearwater on Kauai.

The SOS program on Kauai is designed to reduce mortality of fledglings and adults that have been grounded (i.e., unable to regain flight) due to the attraction to artificial lights or collisions with power lines. The continuation of the SOS program is a clear step to reduce adult mortality.

In summary, the recovery condition of the Newell's shearwater is the necessary survival condition plus specific measures to adequately address the specific threats contributing to the species range-wide endangerment. Specific measures needed to achieve a recovery condition include the elimination or minimization of all three high collision-risk power lines (the Power Line Trail, Kilauea, and the Central Region segments) on the island of Kauai. The recovery condition will need to include the creation or active management of at least two additional healthy shearwater colonies on Kauai and two healthy shearwater colonies on Maui. For example, the two additional colonies on Kauai could be any of those identified by Young and

VanderWerf (2014), or other colonies located independently by KESRP. For the purposes of this biological opinion, a healthy Newell's shearwater breeding colony is defined as containing a: (1) minimum of 1,500 breeding pairs or active burrows, based on long-term monitoring data on the Manx shearwater (Fraser *et al*. 2013; Brooke 1990; BirdLife International 2016b); (2) suitable breeding habitat, including predator-free or low levels of predator presence adequate to sustain in perpetuity a minimum of 1,500 breeding pairs; (3) flyway corridors to and from the colony where there are none or minimal artificial lighting and power line threats; and (4) a colony-population growth rate, λ equal to or greater than one, sustained over at least a generation. Protecting and augmenting any existing Newell's shearwater colonies on Maui will ensure genetic representation and redundancy, allowing the Newell's shearwater to maintain an adaptability and evolutionary capacity over time.

New management actions that have occurred in the last five years include:

- Completion of the 3-hectare predator exclusion fence in 2015, at the Nihoku conservation unit within Kilauea Point National Wildlife Refuge. Newell's shearwater nestling translocations began in 2016 and will continue over four years with the goal of establishing a new Newell's shearwater breeding colony within a fully protected predator-free area on Kauai;
- Predator control efforts to benefit Newell's shearwaters that began in June 2016 and are expected to continue for 2-4 years, within a discrete area (≤ 1 hectare) in Hono o Na Pali Natural Area Reserve, funded by the American Bird Conservancy; and
- Construction of two 1.8-hectare predator-exclusion fences (one each for Newell's shearwater and Hawaiian petrels) in West Maui to protect unoccupied Newell's shearwater breeding habitat. Upon completion of the fence in 2013, social attraction techniques including installation of artificial burrows, decoys, and auditory broadcasts calls have been implemented at the site, along with native vegetation restoration efforts. In June 2016, two prospecting Newell's shearwater adults were recorded on remote cameras (Craig 2016, p. 28).

Recommendations for Future Actions:

- Maintain support and oversight of the two 1.8-hectare Makamakaole Seabird Predator-Proof Fences in West Maui, constructed by First Wind, Inc. and maintained by Kaheawa Wind Power LLC, specifically to create a new Newell's shearwater breeding colony within a predator-free area on Maui. Efforts at this site should be focused on restoring native montane habitat, since this site was previously used for agricultural purposes;
- Conduct additional acoustic surveys within remote areas of Haleakala National Park in southeast Maui, to identify the areas of Newell's breeding habitat and the relative colony population size;
- Construct a predator exclusion fence to fully enclose the entirety of Upper Limahuli colony, followed by efforts to eradicate terrestrial predators and control barn owls;
- Construct a predator exclusion fence to protect the Pohakea colony within Hono o Na Pali NAR; followed by eradication of terrestrial predators within the fence, efforts to reduce barn owl predation, and social attraction techniques to expand the colony;

- Construct a predator exclusion fence along the ridgeline surrounding the Upper Manoa Valley colony, followed by eradication of terrestrial predators within the fence, efforts to reduce barn owl predation, and social attraction techniques to expand the colony;
- Construct an ungulate exclusion fence to protect the Honopu seabird colony to manage depredation by pigs and habitat damage from pigs and goats. The area of Honopu where the ungulate fence would be installed is located within the DLNR State Parks in northwestern Kauai;
- Construct a predator exclusion fence along the edge of the Kalalau Valley, followed by eradication of terrestrial predators within the fence, efforts to reduce barn owl predation, and social attraction techniques;
- Implement erosion control measures, best management practices (e.g., area closures) and native vegetation restoration to prevent damage to sensitive montane habitat, caused by continual access into seabird colonies; and
- Reduce impacts of high collision rate power line segments at the Power Line Trail, the Waimea Canyon, the Kilauea area, and line segments within the Central region including Lihue to Kilohana Crater to Power Line Trail.

ENVIRONMENTAL BASELINE FOR THE NEWELL'S SHEARWATER

This section describes the following: the relationship of the Newell's shearwater population in the action area to the range-wide population; current status of the Newell's shearwater in the action area and the factors influencing that condition; and the role of the action area in its survival and recovery. The recovery plan (USFWS 1983) for the Newell's shearwater does not contain recovery units; therefore, this section provides the Service's characterization of the role of the action area to the survival and recovery of the species.

i. Relationship of the Shearwater Population in the Action Area to the Range-wide Population

Adult Newell's shearwaters do not nest at Barking Sands, but do use the area to transit between their ocean foraging areas and their high elevation, montane nesting sites. Newell's shearwaters transit over the Makaha Ridge and Kokee PMRF sites and Newell's shearwater colonies occur nearby these sites in the northwestern fork of Waimea Canyon and along the Na Pali Coast (DON 2018, KESRP unpublished data) (Figure 9).

Based on statistical analyses of Newell's shearwater calling data from KESRP auditory surveys (Appendix 2), Newell's shearwater population size in the action area was estimated at 35% (8,508 individuals) of the Kauai population. Of these individuals, 5,420 (63.7%) are assumed to be adults (Ainley *et al.* 2001). An estimated 90 percent of the Newell's shearwater population is thought to nest on Kauai (24,310 individuals). Thus, the population in the action area comprises approximately 31.5% of the Newell's shearwater range-wide population.

ii. *Current Condition of the Newell's Shearwater Population in the Action Area*

The primary threats to the entire population of Newell's shearwater are also factors which effect the condition of the population in the action area: artificial nighttime lighting, collisions with power lines, predation by introduced predators, and changes to breeding habitat due to introduced invasive plants. Fledgling Newell's shearwaters fly through the PMRF sites on their first trip to the sea. As described above, fledgling Newell's shearwaters are attracted to brightly lit areas and become disoriented by them. A total of 48 downed Newell's shearwaters were recovered at Barking Sands over the period of 2007 to 2017. Power lines are present in the lowland coastal areas of the action area. The power lines obstruct seabird flyway corridors to and from montane breeding colonies, presenting a risk of collision to transiting seabirds. Predation by non-native predators such as feral cats, barn owls, and rats has been regularly observed in extant breeding colonies in the action area, even in the most remote locations, including the Na Pali Coast (Banfield *et al.* 2013).

Surveys using ornithological radar have not been conducted specifically at PMRF Barking Sands, but surveys have been conducted in Kekaha, approximately five miles south (Raine *et al.* 2017, Day *et al.* 2003). The mean movement in the Kekaha area in 1993 was 54.0 targets/h and in 2013 was 3.6 targets/h (KESRP 2013). As a proxy for the breeding population, the radar data indicates the Newell's shearwater population transiting through the Kekaha area declined at a mean annual rate of 12.7 percent over the 20-year period, similar to the decline of the Kauai population.

In the town of Waimea, ornithological radar surveys have also been conducted, and are considered the best estimate of movement rates of breeding Newell's shearwaters in the Waimea Canyon and Na Pali coast areas. Based on the analyses of ornithological radar data, Day *et al.* (2003) estimated a mean decrease in shearwater movement of 72.4% between 1993 and 2001 in the Waimea area. In 2015, an average of 386.7 seabird targets per hour was detected during three radar surveys in the Waimea area (KESRP 2015). Each survey consisted of four, 30-minute sampling sessions (Raine, pers.comm. 2016). Hawaiian petrels were not visually detected flying over the monitoring site by observers positioned outside radar trucks during the radar surveys (Raine, pers.comm. 2016). The seabird nesting colonies in Waimea Canyon in the northern forks of the Canyon nearest the PMRF communication towers are exclusively occupied by Newell's shearwaters. Based on these observations, the movement rate detected in Session II of the radar survey is composed almost entirely of Newell's shearwaters and represents an accurate reflection of Newell's shearwater movement in the area near the Navy's communication towers at the PMRF Kokee Site. This situation is unique from other radar sites on Kauai, where Session II represents predominately Hawaiian petrel movement and Sessions III & IV reflect Newell's shearwater movement (Raine, pers.comm. 2016).

The Service conducted population modeling to estimate the decline of the Newell's shearwater population in the action area caused by past and ongoing light attraction/fallout, predation, and power line mortalities (Appendix 2). Deterministic matrix modeling followed methodologies in Griesemer and Holmes (2011) and Ainley *et al.* (2001). The model outputs indicate the population of the Newell's shearwater in the action area is declining at a rate of 10.3% per year. This decline in the Newell's shearwater population in the action area is comparable to the mean annual rates of decline indicated by ornithological radar data for the Kekaha area (-12.7%). This

rate of decline is also within the range of annual declines reported in stochastic Newell's shearwater population models which incorporated variability in mortality and climate change (USFWS 2017b, p 159).

iii. *Role of the Action Area in the Survival and Recovery of the Newell's Shearwater*

The population of Newell's shearwaters using the action area is demographically significant. As discussed above, the Newell's shearwater population transiting the action area comprises approximately 31.5% of the range-wide population. Safe passage of shearwaters across the action area as they transit to and from breeding areas is essential to the survival and recovery of the Newell's shearwater.

Newell's shearwater colonies in the Na Pali coast portion of the action area are high priority endangered seabird colonies for implementation of conservation actions: in particular, the Hono o Na Pali NAR, Upper Limahuli Preserve, and Honopu seabird colonies (Banfield *et al.* 2013; Raine and Banfield 2015d). Due to the low threat of seabird/power line collisions to shearwater breeding sites along the Na Pali coast (USFWS 2017b), these breeding sites represent an important refuge for this species. Maintaining or enhancing the capability of these breeding areas to successfully support breeding Newell's shearwaters is essential to the conservation of this species.

Figure 9. Newell's shearwater breeding distribution in the action area (KESRP 2016, unpublished data). *Hotspot light* defined by KESRP as localized aerial activity – sporadic calling and/or aerial activity. *Hotspot heavy* defined by KESRP as localized aerial activity – continuous calling and/or aerial activity.

iv. *Previous Consultations in the Action Area*

In March of 2011, the Service issued a non-jeopardy biological opinion (Service file no. 01EPIF00-2010-F-0430 and 01EPIF00-2010-F-0460) for the PMRF Intercept Test Support action, which addressed the effects of Aegis Ashore Intercept Test Support construction and operation activities at Barking Sands on the Newell's shearwater, Hawaiian petrel, and the band-rumped storm petrel for a period of three years; that biological opinion was amended in October of 2011. The incidental take statement accompanying the amended biological opinion authorized the take of up to ten Newell's shearwaters, one Hawaiian petrel, and one band-rumped storm-petrel over the 3-year term of the action as a result of collision with the boresight towers or due to attraction and fallout from lighting associated with the project. The incidental take statement accompanying the amended biological opinion also authorized the take of up to five Newell's shearwater eggs and/or chicks, one Hawaiian petrel egg and/or chick, and one band-rumped storm-petrel egg and/or chick over the 3-year term of the action as a result of predator control activities at shearwater breeding sites. The no-jeopardy conclusion relied in large part on provisions in the proposed action for minimization and mitigation of take impacts, including predator control within existing seabird breeding colonies and radar surveys to help assess seabird population trends on Kauai.

In April of 2011, the Service issued a non-jeopardy biological opinion for the Kauai Island Utility Cooperative Short-term Seabird Habitat Conservation Plan (STHCP) and Incidental Take Permit (Service file no. 01EPIF00-2011-F-0113, Permit No. TE234201-0), that addressed effects from the operation of existing and new electrical utility facilities on the Newell's shearwater and Hawaiian petrel, until 2016 for the entire island of Kauai. The Incidental Take Permit authorized the take of up to 162 adult, sub-adult, or fledgling Newell's shearwaters annually over the 5-year permit term as a result of attraction to, or collision with, KIUC facilities, as well as the take of up to 18 eggs and/or chicks as a result of the mortality of breeding adults. The annual take of up to two adult, sub-adult, or fledgling Hawaiian petrels was also authorized. Because of the minimization and mitigation measures implemented through the HCP; anticipated reduction in ongoing take from these measures; and implementation of conservation projects to offset unavoidable take (i.e. predator control within existing seabird breeding colonies), the Service concluded that the issuance of the Incidental Take Permit was not likely to jeopardize the continued existence of the Newell's shearwater and the Hawaiian petrel in the wild.

In October of 2011, the Service issued a non-jeopardy biological opinion for the PMRF Advanced Hypersonic Weapons System (Service file no. 01EPIF00-2011-F-0385), which addressed the effects from one-time operation of existing launch facilities at the Kauai Test Facility on the Newell's shearwater and the Hawaiian petrel from October through mid-November of 2011. The incidental take statement accompanying the biological opinion authorized the take of up to four Newell's shearwaters and one Hawaiian petrel over the two-month term of the action caused by seabird attraction and fallout from lighting associated with the project. Because of the minimization and mitigation measures implemented under the proposed action, an anticipated reduction in ongoing seabird take as a result of these measures, and implementation of conservation projects to offset unavoidable take, the Service concluded that the proposed action was not likely to jeopardize the continued existence of the Newell's shearwater and the Hawaiian petrel in the wild.

In September of 2014, the Service issued a non-jeopardy biological opinion (Service file no. 01EPIF00-2014-F-0066) for the PMRF Base-wide Infrastructure, Operations, and Maintenance Activities and their effects on the Hawaiian stilt (*Himantopus mexicanus knudseni)*, Hawaiian moorhen (*Gallinula chloropus sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian duck (*Anas wyvilliana*), Hawaiian goose (*Branta sandvicensis*), Hawaiian hoary bat (*Lasiurus cinereus semotus*), band-rumped storm-petrel, Hawaiian petrel, and the Newell's shearwater. The incidental take statement accompanying the biological opinion authorized the take of up to an average of three Newell's shearwater per year through the foreseeable future. The no-jeopardy conclusion for the Newell's shearwater relied in large part on provisions in the proposed action for lighting minimization and predator control measures at seabird breeding colonies to offset the impacts of incidental take and to provide a net conservation benefit to the species as a whole.

In February of 2017, the Service issued a non-jeopardy biological opinion (Service file no. 01EPIF00-2016-F-0497) for the USAF Pacific Air Forces Regional Support Center Proposed Continuing Operations at Kokee Air Force Station and Microwave Antenna Site and their effects on the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel. The incidental take statement accompanying the biological opinion authorized the take of up three Newell's shearwaters per year, two Hawaiian petrels per year, and two band-rumped storm petrels every 10 years over the life of the project. The no-jeopardy conclusion for the Newell's shearwater, Hawaiian petrel, and band-rumped storm petrel relied in large part on provisions in the proposed action for barn owl control within seabird breeding colonies to offset the impacts of the incidental take.

EFFECTS OF THE ACTION

i. Exposure Analysis Approach

The Service has developed an analysis framework for section 7 consultations that incorporates the general structure, primary concepts, and nomenclature of the U.S. Environmental Protection Agency's ecological risk assessment framework (USFWS 2005). Factors causing adverse effects are referred to as "stressors" and factors causing beneficial effects are referred to as "benefits". Under this approach, the Service determines the effects of the action on listed species and critical habitat by evaluating the location, timing, duration, frequency, and intensity of listed species or critical habitat exposure to each stressor and benefit, and the likely effects of such exposure on the reproduction, numbers, and distribution of the listed species and on the recovery support function of critical habitat.

Using this framework, the proposed action is likely to involve the following stressors: seabird light attraction, seabird collisions with communication towers, and seabird collisions with electrical distribution lines and poles. The proposed action also includes benefits in the form of conservation measures to reduce seabird exposure to artificial lighting during the Newell's shearwater fledging season, reduce predation in nesting colonies during Newell's shearwater breeding season, and restore breeding habitat.

ii. PMRF Lighting

As noted above, listed seabirds are negatively affected by increasing urbanization and the accompanying artificial lights, especially fledglings during their first flight to the ocean from the breeding colony site. When attracted to artificial lights, fledgling seabirds become confused and may suffer temporary night blindness. They often fly into utility wires, poles, trees, and buildings and fall to the ground. The timing of this impact on Kauai is primarily between September 15 and December 15. Adult Newell's shearwaters can also be attracted to lights located near their breeding grounds and affected in a similar manner; however, most shearwater groundings due to lighting involve fledglings (DOFAW 2018). The timing of this impact on Kauai is just prior to breeding (late March /early April) until the chicks fledge (early November).

At PMRF a total of 49 downed Newell's shearwaters were recovered over the 9-year period from 2007 to 2017 (DOFAW 2018, DON 2018).[5] The only incidents of Newell's shearwater fallout at or near PMRF facilities in the action area other than Barking Sands were as follows: the recovery of one bird at Port Allen on the State-operated side of the pier near a light; and the recovery of another shearwater at the Kokee PMRF Site C communications building. There have been no observations of seabird disorientation or fallout at PMRF facilities at Makaha Ridge and Kamokala where there are lower wattage lamps used and a daily presence of Navy personnel.

The Navy has been implementing an array of lighting practices to minimize the risk of seabird light attraction at all PMRF facilities. Although the lights in several key areas at Barking Sands are turned off (the most effective practice to avoid attracting seabirds to facilities) some of the facilities at PMRF require lighting for safety or operations. Lights that cannot be turned off due to safety and/or operational purposes have been shielded, realigned, or replaced with full cutoff fixtures. Such lighting modifications may reduce impacts to listed seabirds by approximately 40 percent (Reed *et al.* 1985, p. 380), but do not completely eliminate the threat.

Since 2010, following modifications of exterior lighting such as realignment, replacement with full cut-off fixtures, and operational changes (DON 2014), a total of 32 Newell's shearwaters were downed at Barking Sands (DOFAW 2018, DON 2018). This includes two larger fallout events: 12 Newell's shearwaters were downed in 2010 and 11 Newell's shearwaters were downed in 2014. Of those downed recently in 2014, six were downed and recovered near the hangar building and five of the 11 died before SOS personnel arrived to pick up the birds. Incorrect positioning of two of four exterior floodlights at the hangar building may have attracted the shearwaters to the building. However, one of the six birds downed at the hanger in 2014 had struck the side of the building when no exterior lights were on, suggesting interior lighting likely attracted the bird.

Under the proposed action, the Navy will implement several conservation measures to reduce adverse lighting impacts to listed seabirds. The Navy will continue to annually inspect night-

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[5] Two additional Newell's shearwaters were found grounded and dead under a communication tower at Kokee Site C at PMRF likely due to collision with the tower. The Navy's biological assessment included these two Newell's shearwaters in the fallout summary (DON 2018, p. 21).

time lighting prior to the start of the seabird fledgling season to confirm implementation of light minimization measures and identify any potential lighting risk that was not previously identified or addressed. The Navy's written *Guideline for Implementation of Conservation Measures* (DON 2015) should increase and maximize the capability of base personnel to salvage and transfer downed seabirds to the SOS program in a timely and appropriate manner throughout the seabird fledging season. In addition, the Navy will, to the extent practicable, minimize seabird fallout risk by scheduling non-time sensitive night operations outside of the peak seabird fledging season.

The Service anticipates that the proposed project is likely to result in a low amount of seabird attraction to artificial night lighting from the use of interior and exterior lighting for operations and safety, particularly the use of exterior Anti-Terrorism/Force Protection lighting associated with the launch areas. The number of night-time operations that the Navy will not be able to avoid during the dark moon phase of the seabird fledging season is estimated to average one per year. While the Navy has renewed their commitment to lighting minimization measures at the PMRF, such as keeping exterior lighting correctly positioned and shielded and the bay doors of the hangar closed as much as possible, the operational use of facilities and launches at Barking Sands during dark moon phases are likely to continue to cause take of seabirds. Historical fallout patterns at PMRF indicate a single fallout event can produce over 10 birds downed (e.g., 2010 and 2014). For these reasons, the Service presumed the lighting conditions during the period from 2014 to 2015 (when night-time operation of lighting resulted in one year with low fallout and one year with a larger fallout event) is representative of lighting conditions over the 50 year period. Therefore, the Service estimates up to 7 fledgling Newell's shearwaters per year are likely to be downed due to attraction to artificial light at Barking Sands.

Photo 1. PMRF Barking Sands at night-time as viewed from PMRF Makaha Ridge site on November 23, 2015. Photo by Adam Griesemer, USFWS.

iii. *PMRF Communication Towers and Electrical Distribution Lines*

As discussed above, seabird collision with narrow-profile structures such as transmission lines and towers is well-documented for Hawaii's listed seabirds, particularly on Kauai. Listed seabirds are nocturnal and fly over 30 miles per hour, making it difficult for them to detect and avoid wires and antennas (Cooper and Day 2003, p. 64). Transmission lines and towers are a stressor source to Newell's shearwaters by obstructing their flyway corridors to and from montane breeding areas. Recent surveys using vertical radar and visual observation to estimate seabird flight altitude show site-specific variation in altitude. In low elevation non-mountainous areas shearwater flight height averages 49.5 ± 25.8 meters above ground (Travers *et al.* 2014, p. 22). In contrast, during an eight-day study at a high elevation mountainous area (along a Power Line Trail segment), a total of 323 shearwaters and Hawaiian petrels were observed transiting with 43.2% observed flying through or colliding with a power line segment at a height of approximately 88 meters above ground [78 m above the surrounding 10 m high vegetation) (Travers *et al.* 2013, p. 73; Travers *et al.* 2014, p. 26)].

The facilities at Barking Sands include approximately 7 miles of 12 kV electrical distribution lines and poles. Line heights that are at or below vegetation levels have been shown to significantly reduce the potential for seabird collisions with power lines (Ainley *et al.* 1995, Travers *et al.* 2013, Travers *et al.* 2014). No downed seabirds found by Navy personnel or recovered by the SOS program (DOFAW 2018) have been associated with the electrical distribution structures at PMRF, and vegetation at PMRF is within the range of height of distribution lines. For those reasons, the Service anticipates that vegetation cover is likely to shield seabirds from collision with electrical distribution facilities on the PMRF.

Under the proposed action, existing communication towers on the PMRF will continue to be maintained and operated. These towers create a potential for Newell's shearwaters to collide with the towers while flying between their nesting grounds in the mountains and feeding grounds at sea. The timing of this threat extends from late March / early April when Newell's shearwaters occupy their nesting grounds, just prior to breeding, until early December when the last shearwater chicks of the season fledge and fly to the sea. During the non-breeding season, Newell's shearwaters remain at sea the entire time, therefore, they are not likely to collide with a communication tower or antennae, or any other structure on land during this time.

In 2008, the Service provided the Navy with a search protocol for conducting carcass searches for downed seabirds to estimate the number of avian fatalities attributable to collisions with communication towers at PMRF. Surveys were then conducted using this search protocol. From October to December of 2008, searches for downed seabirds were performed every three to four days under each communication tower at Barking Sands, and a search efficiency trial was conducted to assess the potential for searchers to miss carcasses or live birds during searches following the Service's protocol. In 2010, the 2008 protocol surveys were expanded to the two antennas at Makaha Ridge and two communication towers at the Kokee sites in addition to the 14 towers at Barking Sands. A scavenger trail was conducted to estimate the number of carcasses or downed seabirds that may have been missed in 2008 due to removal of birds by scavengers (e.g., cats). In 2015, the surveys were repeated for all the towers. Searches of the communication towers at Kokee Site C in both 2010 and 2015 were conducted in open space within accessible search areas (Kleidosty Pacific 2011, p.2; Kleidosty Pacific 2016, p. 33). At

Barking Sands, to date, no mortality of listed seabirds due to collision with communication towers have been observed. However, at Kokee Site C, two adult Newell's shearwaters were found grounded and dead under Tower 764: one during the 2015 surveys (Kleidosty Pacific 2016) and one during a Navy site visit to the communication tower in 2017 (DON 2017).

In addition to the above, the Service considered the following information to assess seabird collision risk for purposes of this analysis: (1) the location of communication towers in relation to Newell's shearwater breeding colonies, including proximity and elevation; (2) the area of the tower exposed and height above the vegetation level; and (3) the results of studies of seabird collisions with utility structures conducted on Kauai. In considering the study results, we also evaluated the sufficiency of carcass searching in relation to the vegetation and topography of the area surrounding towers.

Information pertaining to seabird collision risk suggests a very low likelihood of collision with communication towers located at Barking Sands. The communication towers are located near sea level and approximately 10 miles from the nearest known Newell's shearwater breeding colony (Figure 9). The towers are exposed approximately 140-170 feet in height (~43 to 52 meters[6]) above the vegetation level. Studies conducted at power lines located along Kaumualii Highway to the north of Barking Sands suggest that Newell's shearwaters are less likely to fly at power line height (Travers *et al.* 2016). In addition, low numbers of Newell's shearwaters were observed transiting in this area (Travers *et al.* 2016). The towers at Barking Sands are positioned in open grass fields in a relatively flat coastal plain which facilitates carcass detection.

Information regarding seabird collision risk for towers at Kokee Site C suggests a high likelihood of collision. The site is located at an elevation of 3,700 feet, near multiple Newell's shearwater breeding colonies, the nearest located less than 1 mile away in the north fork of the Waimea Canyon. The two communication towers at the PMRF Kokee C site are 110 feet in height (~33 meters). Approximately 100 feet (~30 meters) of the tower is exposed above the surrounding vegetation level (~10-16 feet, 3-5 meters). Tower 764 has 21 guy wires which greatly increases the exposure area of the tower. Utility collision monitoring studies on Kauai have found that strike rate increases with exposure height at high elevation utility structures (e.g., Power Line Trail) as evidenced by a significant positive relationship between strike rate and power line exposure height ($n=20$, Spearman's rho (rs)=0.577, $p=0.015$) (Travers *et al.* 2014). The dense vegetation and topography surrounding the towers at Kokee Site C limits the accessible searchable area around towers and severely reduces the effectiveness of discovering seabirds that collide with the tower or guy wires and descend into the vegetation. During collision-passage studies conducted at the Power Line Trail on Kauai in forested areas with vegetation similar to that found surrounding the PMRF Kokee site, researchers have detected hundreds of seabird strikes with power lines using song meters, yet as of 2016 had recovered only three grounded and dead seabirds (Hawaiian petrels) on the Trail (Travers *et al.* 2013, Travers *et al.* 2014, Travers *et al.* 2015). These results indicate that carcass recovery alone is not a good predictor of seabird line collisions in this type of terrain and vegetation.

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[6] Units are expressed in feet as well as meters in the Effects of the Action, Section D for the purpose of describing units consistently between the Service's assessment of seabird collision risk and tower fatality model.

a) Kokee Communication Tower Fatality Model

Due to the seabird collision risk associated with communication towers at Kokee Site C, the Service developed a collision model to estimate Newell's shearwater fatalities at this site. The collision model (Appendix 1) is based on a template modified from Sanzenbacher and Cooper 2013, incorporating updated seabird movement rates for Waimea (as described in the Environmental Baseline, section *ii*) and tower characteristics. For purposes of this analysis, these estimates are considered as effects that are reasonably certain to occur because information regarding seabird collision risk for towers at Kokee Site C suggests a high likelihood of collision which cannot be detected through current ground survey monitoring methods.

Movement rates were defined as the average of Newell's shearwater movement rates as measured by radar surveys conducted in the summer of 2015. We were not able to account for seasonal variation in movement patterns in our fatality estimates due to the limited information available.

Information on collision-avoidance behavior exhibited by Newell's shearwaters (i.e., birds that completely alter their flight paths horizontally and/or vertically to avoid flying through the space occupied by a structure) suggests that avoidance responses are high based on observations of seabird interactions with power lines on Kauai (Travers *et al.* 2014, Travers *et al.* 2015, Cooper and Day 1998). Based on this information, for purposes of the model, the Service considered 99% of seabirds flying through the airspace near communication towers (including airspace above and around the tower) avoid a collision fatality (i.e., 99% avoidance rate).[7] Using this information, the Service model estimated between 50 adult Newell's shearwater fatalities per year are likely to occur due to their collisions with the communication towers at the Kokee Site (Table 3 and Appendix 1). Including the presence of guy wires at Tower 764 increased the exposure area of the tower, resulting in a fatality estimate higher than at Tower 763.

In addition, using information on population demographics, the Service estimated the number of Newell's shearwater chicks or eggs that are likely to be killed per year as a result of its parent colliding with a communication tower. This results in up to seven Newell's shearwaters chicks or eggs that are likely to be killed per year, assuming that 60% of adults killed in the action area would have been breeding and 46% of breeding attempts would have resulted in a chick fledgling in the nest (i.e., breeding probability of 60% and reproductive success of 46%; Appendix 2).

Table 3. Fatality Model Estimates for the Kokee Towers Site based on 99% avoidance

Movement Rate	Tower 764	Tower 763	Total
2015 Average	42.89	7.14	50.03

[7] See Appendix 1 for full description of tower collision model. The 99% avoidance described in this section refers to the annual fatality probability which is applied as a percentage to the product of exposure rate, vertical interaction probability, and horizontal interaction probability.

iv. *Population Modeling of Impacts from PMRF Lighting and Communication Towers*

For purposes of this analysis, the Service relied on deterministic modeling to calculate Newell's shearwater population assessment metrics for growth rate and population loss (Appendix 2). This population model provided an estimate of decline that would be associated with additional seabird fallout and additional seabird/tower collision mortalities due to PMRF activities, absent any mitigation of these impacts given the current condition of the species in the action area. In other words, this population model teases out the additional decline and population loss that would be caused by the proposed action in the absence of beneficial effects of predator management funded by proposed Navy contributions to NFWF (*See* Effects of Action, section *vi* for description of beneficial effects). Because the proposed action duration is a 50 year period, impacts were modeled over that time period. For purposes of this analysis, these estimates constitute the best available scientific information and are considered effects that are reasonably certain to occur, absent mitigation of these effects, because of factors delineated in: (1) the Status of the Species section; (2) the Environmental Baseline section; and (3) information contained in this section regarding past and ongoing fallout at PMRF facilities and seabird collision fatalities at Kokee Site C.

The "Environmental Baseline with PMRF Activities" model projected the additional decline due to the effects of (a) additional seabird fallout due to light attraction and (b) additional seabird/tower collision mortalities likely to be caused by PMRF activities over the 50-year term of the proposed action on the Newell's shearwater population occurring in the action area (approximately 8,500 individuals). The baseline rate of decline in the population in the action area was also projected over the 50-year period in the "Environmental Baseline" model.

To model the per year estimate of additional seabird fallout and seabird/tower collision mortalities caused by PMRF activities, the Service followed deterministic modeling methodologies described in Griesemer and Holmes (2011) and Ainley *et al.* (2001). Per year estimates were expressed as a proportion of the number of individuals in the respective age class in the current action area population. The fledgling loss due to fallout equaled 1% (7 fledglings of 750 total fledglings from breeding colonies). The mortality of 50 adults due to tower collisions equaled 0.92% of the adult population as estimated in the Environmental Baseline section in this biological opinion, section *i* (5,420). The additional fledgling fallout losses reduced reproductive success by a rate of 0.44% per year (approximately 1% of 46% reproductive success) while the additional seabird/tower collisions reduced adult survival by a rate of 0.92% per year. These mortality rates were held constant (i.e., kept the same) when projected over the 50-year project term.

Based on the findings of the Environmental Baseline with PMRF Activities model, which added the adverse effects of the proposed action on the Newell's shearwater to the Environmental Baseline estimates, light attraction fallout and seabird collision fatalities likely to be caused by PMRF lighting and communication towers increased the annual decline of the Newell's shearwater Environmental Baseline condition from -10.3% to -11.0% (a decrease in the growth rate from a λ of 0.897 to 0.890).

The Environmental Baseline with PMRF Activities model also calculated the total (accumulated) take of Newell's shearwaters that is likely to occur over a 50-year period of implementing the action. The accumulated adverse effect of PMRF activities over a 50-year period of

implementing the action is likely to result in the loss of 450 adults and 63 egg/chicks caused by PMRF communication towers and the loss of 63 fledglings due to PMRF lighting. The number of Newell's shearwaters taken per year is anticipated to decrease each year, because as years pass in the implementation of the proposed action, the Newell's shearwater population in the action area is anticipated to decline by 11% and the proportion of individuals affected by the action in each respective age class (fledgling, sub-adults, and adults) of the action area population remains the same. For example, the number of adult seabird collision fatalities (50 individuals in the first year, see Effects of the Action, section *iii,a*) decrease by 11% per year with the action area population (i.e., fatalities continue to equal 0.92% of the action area adult population). The estimated number of indirect mortalities (7 chicks or eggs in the first year) due to the loss of these breeding adults also continues to decrease by 11% per year with the action area population. In addition, the number of fledgling seabird mortalities due to fallout (7 in the first year) decreases with the action area population. Thus, the proposed action results in less mortality per year as years pass in its implementation due to the decreasing population trend of the population in the action area.

v. *Summary of the Total Take of Newell's Shearwater due to Proposed Action*

The total anticipated take of Newell's shearwaters as a result of PMRF lighting and communication towers over the 50 year term of the action, is shown below and in Table 4.

Over the 50 year project term, up to an average of seven (7) fledgling Newell's shearwaters per year and a total maximum of 63 fledgling Newell's shearwaters are likely to be killed or injured as a result of attraction and fallout from lighting associated with the proposed action (*See* Effects of the Action, section *ii*, pg. 41 & section *iv*, pg. 45).

In addition, over the 50 year term, up to an average of fifty (50) adult Newell's shearwaters per year and a total maximum of 450 adult Newell's shearwaters are likely to be killed or injured due to collision with communication towers associated with the proposed action (*See* Effects of the Action, section *iii*, a, pg. 44 & section *iv*, pg. 45).

Finally, over the 50 year term, up to seven (7) Newell's shearwater eggs/chicks per year and a total maximum of 63 eggs/chicks are likely to be killed as a result of a parent colliding with a communication tower as a result of the proposed action (*See* Effects of the Action, section *iii*,a, pg. 44 & section *iv*, pg. 45).

Table 4. Annual estimate of take and total (accumulated) take of Newell's shearwater that is likely to occur over the 50-year period of the proposed action. The 50-year take estimate denoted by the asterisk (*) are calculated from results of the Environmental Baseline with PMRF Activities model which indicates the number of Newell's shearwater taken per year is anticipated to decrease at the same rate of decline as the population in the action area.

		Annual	**50-year***
PMRF lighting	Fledglings	7	63
PMRF Communication Towers	adults & sub-adults	50	450
	eggs/chicks	7	63

vi. *Beneficial Effects of Conservation Measures*

The implementation of lighting practices to minimize seabird attraction by the Navy at PMRF will likely reduce the attraction of listed seabirds, but does not completely eliminate the threat as discussed above (See Effects of the Action, section *ii*, pg. 42). In order to offset the total anticipated take over the project duration as described in the previous section, the Navy and NNSA will provide funding to support management activities for predator and ungulate removal at an existing Newell's shearwater colony on Kauai where current management does not exist or is insufficient to adequately enhance the reproductive success of the Newell's shearwater. The Navy and NNSA will direct funds to the Hawaiian Seabird Conservation Account, developed by the NFWF and administered by the Service for the management of Newell's seabird breeding colonies on Kauai. The Navy's contributions are anticipated to support, annually, management for 30 breeding pairs in 2018 and build to 50 breeding pairs by 2022, and then continue annually in years after 2022 at the same level unless the Navy and Service reinitiate consultation and this conservation measure is no longer deemed necessary.

a) Population Modeling of Benefits from Colony Management

The Service used the following approach to calculate the benefit of the proposed funding of colony management for purposes of off-setting the accumulated total losses of Newell's shearwaters equal to 63 fledglings injured or killed, 450 adults injured or killed, and 63 eggs/chicks killed (i.e., the maximum take) due to the proposed action over the 50 year action.

In order to determine the increase in fledgling production from implementing predator management at nesting colonies for the purposes of this analysis, the Service relied on deterministic modeling (the "Predator Management" model, Appendix 2), building on methodologies in the Environmental Baseline with PMRF Activities model above (*See* Effects of the Action, section *iv*). The Service determined that the deterministic model used in this analysis is the appropriate tool to clearly illustrate (1) the Navy's impacts to the Newell's shearwater population within the action area and (2) the beneficial effect of predator management to offset these impacts as a result of Navy funding contributions to NFWF.

In the Environmental Baseline with PMRF Activities model, we added threats that decreased demographic parameters to define the current condition in the action area and Kauai population, respectively. In the Predator Management model, we added predation to one meta-population in the action area then added predator control which removed a proportion of the decrease due to predation in the parameters.

The Predator Management model was developed to estimate the beneficial effect of PMRF's proposed predator management at breeding sites on the population in the action area (Appendix 2). We expressed the effect of management as a change in the number of fledglings produced by the breeding pairs that would be directly affected by the management. We considered management that decreased predation by removing predators, including feral cats, feral pigs, rats, and barn-owls. We expressed the efficacy of the management by decreasing predation of individuals and nests proportionally (considering that management would be 70-90% effective in reducing predation) such that 80% management efficacy meant that out of 20 burrows with

chicks or eggs depredated in the absence of management, predator removal would reduce the number of depredated burrows to 4 (20 percent of 20 burrows)(Appendix 2).

The proposed conservation measure will provide funding to protect a nesting area with the capacity to support at least 50 breeding pairs. Based on experience in the field, protecting such an area with sufficient predator management will likely result in a gradual increase in the number of pairs and requisite funding to support further expanding the predator management as the colony grows in size. The Service anticipates the predator management as a result of the Navy's contributions to NFWF is likely to achieve a targeted increase in shearwater reproductive success (and resulting fledgling production) at established or new breeding areas that are protected and managed. Predator control at 80% effectiveness for 50 breeding pairs over 50 years would provide a reproductive benefit of 1,476 fledglings to the Kauai population (Appendix 2). Although it is anticipated that the population at the nesting area receiving management will not reach 50 breeding pairs until the year 2022, the continuing growth of the colony beyond 50 pairs (in years 2023 to 2068) will likely provide additional benefits in excess of these modeled estimates. The Service anticipates this management will likely offset the losses due to PMRF activities and the additional decline of the shearwater population occurring in the action area caused by the additional seabird fallout due to light attraction and additional seabird/tower collision mortalities likely due to PMRF activities over the 50-year term of the proposed action.

Non-native predators are significantly impacting Newell's shearwater populations in the action area as described in the Environmental Baseline section in this biological opinion. The predator management funded by Navy contributions will reduce predation in a nesting colony(ies) addressing a major threat to the continued existence of the Newell's shearwaters breeding in that colony(ies).

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur within the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

Future state, local, or private actions that are reasonably certain to occur in the action area are listed below.

- KIUC submitted a permit renewal request to the Service for its STHCP and ITP, prior to its expiration in May of 2016, to cover the period until the Service renders a decision on their Long-term HCP, which is currently under development. In the interim, the Service estimates that 1,800 Newell's shearwater mortalities are occurring per year as a direct result of power line strikes under the KIUC STHCP and ITP, using the rounded average of 2014 and 2015 strikes from scenarios IV, VB, and VIA selected in the USFWS Newell's Shearwater Landscape Strategy Appendix 2 (2017b, p. 123). Based on coordination with KIUC in February 2018, the Service anticipates receiving a revised

draft Long-term HCP by the end of 2018 that will propose minimization and mitigation measures to address these take impacts.

- State and local governmental entities together with other private entities are expected to apply for a State incidental take license and a Federal incidental take permit in 2018, to address ongoing and future take of Newell's shearwaters within the action area caused by the use of artificial nighttime lighting. The state-sponsored Kauai Seabird HCP is anticipated to seek authorization for an approximate annual *lethal* take of up to 30 shearwaters and *non-lethal* take of 45 shearwaters. This state-sponsored HCP is being developed to address a stressor responsible for an aspect of the environmental baseline conditions for Newell's shearwaters within the action area.

CONCLUSION

After reviewing the current status, the Environmental Baseline, the Effects of the Action, and the Cumulative Effects, it is the Service's Biological Opinion that the proposed action discussed herein is not likely to jeopardize the continued existence of the Newell's shearwater. As stated in the Effects section above, the adverse effects of the proposed action over the 50 year term of the action are likely to result in anticipated take in the form of injury or death for up to 63 Newell's shearwater fledglings as a result of attraction and fallout from lighting, 450 Newell's shearwater adults due to collision with communication towers as well as the death for up 63 eggs/chicks as a result of a parent colliding with a communication tower. The beneficial effects of the seabird mitigation will offset the anticipated loss of the fledglings, adults, and eggs/chicks as well as any additional decline of the population in the action area. Overall, taken all these effects together, there will not be a significant change in the reproduction, numbers, or distribution of the Newell's shearwater that will reduce appreciably the likelihood of both the survival and recovery of these species in the wild.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered or threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including, breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered a prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Navy and NNSA in order for the exemption in section 7(o)(2) to apply. In order to monitor the impact of incidental take, the Navy and NNSA must report the progress of the action and its impact on the listed species to the Service as specified in this incidental take statement and reporting requirements below [50 CFR 402.14(i)(3)].

Amount or Extent of Take Anticipated

Based on the analysis presented in this biological opinion, the Service anticipates the following incidental take may occur for as long as PMRF infrastructure, operations, and maintenance are active and in place.

Newell's Shearwater
Over the 50 year project term, up to an average of seven (7) fledgling Newell's shearwaters per year and a total maximum of sixty-three (63) fledgling Newell's shearwaters are likely to be taken in the form of injury or death due to attraction and fallout from lighting associated with the project.

Over the 50 year project term, up to an average of fifty (50) adult Newell's shearwaters per year and a total maximum of four hundred fifty (450) adult Newell's shearwaters are likely to be taken in the form of injury or death due to collisions with communication towers associated with the project.

Over the 50 year project term, up to seven (7) Newell's shearwater chicks or eggs per year and a total maximum of sixty-three (63) Newell's shearwater chicks or eggs are likely be taken in the form of injury or mortality as a result of its parent colliding with a communication tower.

The Migratory Bird Treaty Act (MBTA) of 1918 as amended (16 USC 703-712) prohibits the purposeful take of migratory birds without a permit. However, incidental take of birds is no longer considered a violation of MBTA (DOI M-Opinion 37050, https://www.doi.gov/sites/doi.gov/files/uploads/m-37050.pdf); thus, incidental take statements under ESA no longer convey incidental take authority under MBTA to species covered by both acts.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the effect of take on Newell's shearwater:

(1) The Navy and NNSA will minimize the potential for death or injury of Newell's shearwater due to lighting at PMRF.

(2) The Navy and NNSA will minimize the potential for death or injury of Newell's shearwater due to collisions with PMRF communication towers.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Navy and NNSA must comply with the following terms and conditions, which implement the reasonable and prudent measures, described above and specified reporting requirements. These terms and conditions are nondiscretionary.

1. Minimize impacts of PMRF lighting on the survival and reproduction of Newell's shearwater.

   1.1. The Navy will schedule non-time sensitive night operations outside the peak of the fledging season to the extent practicable.
   1.2. Navy will schedule operations planned to occur during peak fledging season to avoid dark moon phases to the extent practicable.
   1.3. The Navy will train personnel about listed seabird fallout and methods for searching for downed birds, and conduct searches for downed listed seabirds at all facilities with lighting.
   1.4. The Service will be notified by telephone and email within 24 hours upon the discovery of an injured or dead Newell's shearwater at PMRF. This includes notification for Newell's shearwaters turned into the SOS aid station by Navy personnel or members of the public. The Navy and NNSA will provide the Service a written notification, summarizing the event, within 30 days. The Navy and NNSA will also follow the protocols to report downed wildlife in Appendix 3, Attachments 1 and 3, when any carcass of a listed species is found injured or dead.
   1.5. Access to any of the PMRF sites will be provided by the Navy and NNSA to the Service with 24 hour notification so that they may independently monitor for seabirds and retrieve reported downed seabird carcasses.
   1.6. The Navy and NNSA will submit annual reports detailing the implementation of the above Terms and Conditions used to minimize impacts of the action. The first report will be submitted by January 30th, one and half months after the end of the first seabird season following the issuance of this biological opinion and continue annually throughout the life of the project. Annual reports will summarize survey and monitoring results, and levels of take of Newell's shearwater. Because the amount of incidental take anticipated for Newell's shearwater are expressed in terms of the average number of individuals that may be taken, the following formula will be used to calculate average take for these species, whereby "b_p" is the take of the species since date of the biological opinion issuance, "p" is the take assessment period expressed as the total number of years since date of the biological opinion issuance, and "R_p" is the average take of the species per year over the take assessment period:

$$R_p = \frac{b_p}{p}$$

   1.7. Should take of listed species occur and the carcass be recovered, the Service may request that the carcass be shipped to Honolulu for necropsy and species verification. Otherwise, the depository designated to receive specimens of the listed species that

are found is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817 (telephone: 808/847-3511). If the B.P. Bishop Museum does not wish to accession the specimens, contact the Service's Division of Law Enforcement in Honolulu, Hawaii (telephone: 808/861-8525; fax: 808/861-8515) for instructions on disposition.

2. Minimize impacts of communication towers on the survival and reproduction of Newell's shearwater.

2.1. The Navy will assess what measures can be implemented at Kokee communication tower 764 and implement effective measures to the maximum extent feasible.

2.2. The Navy and NNSA will monitor incidental take as described in Appendix 3 for monitoring communication towers. In addition to the ground based carcass searches as described in Appendix 3, the Navy will monitor using other methodologies as approved by the Service and report the number of seabird collisions with communication towers at Kokee Site C.

2.3. The Service will be notified by telephone and email within 24 hours upon the discovery of an injured or dead Newell's shearwater at PMRF. This includes notification for Newell's shearwaters turned into the SOS aid station by Navy personnel or members of the public. The Navy and NNSA will provide the Service a written notification, summarizing the event, within 30 days. The Navy and NNSA will also follow the protocols to report downed wildlife in Appendix 3, Attachments 1 and 3, when any carcass of a listed species is found injured or dead.

2.4. Access to any of the PMRF sites will be provided by the Navy and NNSA to the Service with 24 hour notification to allow independent monitoring for seabirds and to retrieve reported downed seabird carcasses.

2.5. The Navy and NNSA will submit annual reports detailing the implementation of the above Terms and Conditions used to minimize impacts of the action. The first report will be submitted by January 30th, one and half months after the end of the first seabird season following the issuance of this biological opinion and continue annually throughout the life of the project. Annual reports will summarize survey and monitoring results, and levels of take of Newell's shearwater. Because the amount of incidental take anticipated for Newell's shearwater are expressed in terms of the average number of individuals that may be taken, the following formula will be used to calculate average take for these species, whereby "b_p" is the take of the species since date of the biological opinion issuance, "p" is the take assessment period expressed as the total number of years since date of the biological opinion issuance, and "R_p" is the average take of the species per year over the take assessment period:

$$R_p = \frac{b_p}{p}$$

2.6. Should take of listed species occur and the carcass be recovered, the Service may request that the carcass be shipped to Honolulu for necropsy and species verification. Otherwise, the depository designated to receive specimens of the listed species that are found is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817 (telephone: 808/847-3511). If the B.P. Bishop Museum does not wish to accession

the specimens, contact the Service's Division of Law Enforcement in Honolulu, Hawaii (telephone: 808/861-8525; fax: 808/861-8515) for instructions on disposition.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs all Federal agencies to use their authority to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The term "conservation recommendations" has been defined as suggestions from the Service regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or critical habitat or regarding the development of information. The recommendations provided here relate only to the proposed action and do not necessarily represent complete fulfillment of the agency's 7(a)(1) responsibility for the species.

The Service recommends that the Navy and NNSA undertake the following conservation recommendations:

- Assist with island- and State-wide efforts to assess and minimize the effects of communications towers, power transmission lines, lighting, and other threats to Newell's shearwaters posed by infrastructure.

REINITIATION NOTICE

This concludes formal section 7 consultation on this action. As required in 50 CFR § 402.16, reinitiation of consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by this action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your efforts to conserve protected species. If you have any questions concerning this biological opinion, please contact Mary Abrams of the USFWS Pacific Islands Fish and Wildlife Office at (808) 792-9400.

Sincerely,

Mary M Abrams

Digitally signed by Mary M Abrams
Date: 2018.08.20 08:35:54 -10'00'

Mary Abrams
Field Supervisor

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APPENDIX 1. Estimated average fatality rates of Newell's shearwater for communication towers at the PMRF Kokee Site, Kauai, based on radar data collected in summer of 2015.

Movement Rates		**Tower 764**	**Tower 763**	**Notes / References**
A	Movement rate during peak hours (average targets/hour)	386.70	386.70	KESRP 2015
B	Total movement rate during peak hours (targets/6.5 hours)	2,513.55	2,513.55	(A x 6); 6.5 peak hours of movement
C	Daily movement rate (targets/day)	2,840.31	2,840.31	(B x 1.13); 1 (6.5 peak hours) + 0.13 (mean proportion of birds moving during off-peak hours of night)
D	Flock size (Mean birds/target)	1.02	1.02	
E	Daily movement rate (birds/day)	2,897.12	2,897.12	(C x D)
F	Mortality domain (days/year)	231.00	231.00	Breeding phenology adults present week 14-46 (33 weeks x 7 days)
G	Annual movement rate (birds/year)	669,234.20	669,234.20	(E x F)
Tower Characteristics				
H	Height of tower exposed above tree line (m)	30.53	30.53	Tree height is approximately 3-5m. Exposed tower is height of tower minus tree height
I	Tower width at base (m)	9.14	9.14	Estimate of tower width at base is 30 feet
J	Exposed area of tower above tree line (m^2)	279.15	279.15	(I x H)
K	Height of highest guy wire exposed above tree line (m)	30.53	0.00	Guy wires anchored at top of Tower 764
L	Guy wire distance from pole exposed above tree line (m)	45.79	0.00	Estimate of maximum distance
M	Area occupied by guy wires (m^2) both sides	1,398.03	0.00	Area to the left and right of tower in profile (A = ((1/2)b x h) x 2)
Horizontal Interaction Probability				
N	Maximum cross-sectional of exposed area of tower (m^2)	1,677.18	279.15	(J + M)
O	Cross-sectional sampling area of radar above tree line and below tower height (m^2)	91,584.0	91,584.0	(3,000m x H)
P	Probability of NESH intersecting tower	0.018313	0.003048	(N/O)
Vertical Interaction Probability				
Q	Proportion of birds flying above treeline and below overall tower height (~33.5m)	0.350	0.350	Travers et al. 2014, p.41, ~ % of birds flying below 35m at powerlines with similar exposure height to Kokee comm.towers
Exposure Rate				
R	Annual exposure rate	4,289.49	713.94	(G x P x Q)
Annual Fatality Probability				
S	90% Avoidance (R x 0.10)	428.95	71.39	
T	95% Avoidance (R x 0.05)	214.47	35.70	
U	**99% Avoidance (R x 0.01)**	**42.89**	**7.14**	

APPENDIX 2.

Newell's Shearwater Population Modeling to Inform the Biological Opinion for the Pacific Missile Range Facilities Base-wide Infrastructure, Operations, and Maintenance Activities.

APPENDIX 3.

Carcass search protocol provided by USFWS to be used for monitoring for nocturnal seabird fallout at communication towers at PMRF.

1.0 STANDARDIZED CARCASS SEARCHES

Carcass searches will be conducted to estimate the number of avian fatalities attributable to the broadcast towers. An estimate of the total number of carcasses will be made by adjusting for removal bias (affected by scavenging) and searcher efficiency bias (affected by detection) (see Sections 2.0 and 3.0). The methods, timing, and duration of the carcass searches are described below.

1.1 Methods

Personnel trained in proper search techniques ("the searchers") will conduct carcass searches at the broadcast tower location pursuant to timing specified by the carcass scavenging trials, but no less than two times per week. Boundaries of square plots will be delineated along each broadcast tower. A strip transect design is appropriate for this study, providing almost 100 percent coverage of the search area. Each search plot will be split into four quadrants, with each searched sequentially. This facilitates the searchers ability to stay on transect lines and maximize searching efficiency (Gritski pers. comm. 2006).

Important factors considering in developing this monitoring plan include tower dimensions, target species size, and vegetation structure. Because most carcass searches to date have been associated with wind power projects, we use standards developed for that industry. When carcass searches are conducted for wind turbines, plot size typically extends outward from the base of a wind turbine a minimum distance equal to the turbine height.

The subject towers are variable in height. If the results from the initial carcass surveys show that the plot size is too large or small, the area will be adjusted accordingly pending approval by the Service. Geographic Positioning System (GPS) locations of the search plot corners will be included in initial data collection. Transects will be set at approximately 6 meters (19.7 feet) apart, depending on the habitat type, and the searcher will walk along each transect at a rate of 45-60 m per minute searching both sides out to 3 m (10 feet) for downed birds and bats. Search area and speed may be adjusted by habitat type, after evaluation of the first searcher efficiency trial, if needed. The applicant may request approval from the Service to revise the search protocol. Since equipment cabinets and other structures associated with the towers will obstruct transects, the areas with equipment will be searched such that those areas have 100% coverage.

If a carcass of a listed species is found, searchers will follow the Downed Wildlife Protocol (**Attachment 1**), and carcasses will be left in place and moved only if directed by the Service. If directed to move the carcasses, searchers will deliver carcasses to Service Law Enforcement who will send them to a forensics lab for future reference and necropsy.

All carcasses found during the standardized carcass searches will be recorded and identified by a unique number. A copy of the data sheet for each carcass will be kept with the carcass at all times. For each carcass found, searchers will record species, sex and age when possible, date and time collected, location, condition and any comments that may indicate cause of death

(**Attachment 2**). Searchers will record the condition of each carcass found, using the following condition categories:

- Intact – a carcass that is completely intact, is not badly decomposed and shows no sign of being fed upon by a predator or scavenger
- Scavenged – an entire carcass that shows signs of being fed upon by a predator or scavenger, or portions of a carcass in one location (e.g., wings, skeletal remains, legs, pieces of skin, etc.)
- Feather Spot – 10 or more feathers at one location indicating predation or scavenging or 2 or more primary feathers

Searchers will photograph each carcass as found and establish GPS points, with point accuracy provided. A detailed map of the search area will then be created showing the location of the broadcast towers and associated facilities, the study area, and any carcasses located.

The searchers may discover carcasses incidental to formal carcass searches (e.g., predation or while driving within the project area). For each incidentally discovered carcass, the searcher will identify, photograph, and record data for the carcass as would be done for carcasses found during formal scheduled searches.

Any injured native birds found on the facility site will be carefully captured by a trained project biologist or technician and transported to a local wildlife rehabilitator. All project staff and consultants will be trained on how to handle any downed wildlife or carcasses found anywhere within the project area. Furthermore, an Avian Injury/Mortality Form (**Attachment 3**) will be completed for any injured or killed animal found.

1.2 Important Considerations

Important factors to consider in developing the monitoring plan include target species size and the type of vegetative cover being surveyed. The Hawaiian petrel and Hawaiian goose are relatively large birds. Downed individuals should be detectable compared to smaller bird species and most bats.

2.0 CARCASS SCAVENGING TRIALS

"Carcass scavenging or removal" is the disappearance of a carcass from the search area due to scavenging. This may serve as a potential source of bias associated with fatality rate estimation. Scavengers may preclude detection of carcasses or make it problematic to identify remains and determine cause of death. Thus, seasonal differences in scavenging rates (i.e., changes in scavenger population density) and possible differences in the size of animal being scavenged are typically taken into account when estimating fatality. Additionally, the timing of fatality searches must be conducted at a frequency that minimizes loss due to scavenging.

The objective of the carcass scavenging trials is to document the length of time avian carcasses remain in the search area and subsequently determine the frequency of carcass searches within the search plots. Carcass scavenging trials will be conducted during each season in the vicinity of the search plots. Carcass scavenging rates will be used to adjust carcass surveys for removal bias. Removal rates will be determined for each season.

Carcasses used in the trials may include representatives of the seabirds if legally available and permitted by the Service and DOFAW. Navy will coordinate with the Service to follow appropriate protocols in using carcasses during carcass scavenging trials. Carcasses of legally obtained wedge-tailed shearwaters, commercially available adult game birds, or cryptically colored chickens will be used to simulate seabirds.

To avoid confusion with broadcast tower-related fatalities, planted carcasses will not be placed in fatality monitoring search plots. Planted carcasses will be placed in the vicinity of the broadcast towers but not so near as to attract scavengers to the search plots. The planted carcasses will be located randomly within the carcass scavenging trial plots.

Carcasses will be placed in a variety of postures to simulate a range of natural conditions. For example, birds will be: 1) placed in an exposed posture (e.g., thrown over the shoulder), 2) hidden to simulate a crippled bird (e.g., placed beneath a shrub or tuft of grass) and, 3) partially hidden. Trial carcasses will be marked discreetly for recognition by searchers and other personnel. Trial carcasses will be left at the location until the end of the carcass scavenging trial.

Carcasses will be checked as follows, although actual intervals may vary. Carcasses will be checked for a period of 28 days to determine removal rates; however, total number of searcher days will be adjusted according to observed scavenging rates. Carcasses will be checked approximately every day for the first 7 days, and then on day 10, day 14, day 21, and day 28. This schedule may vary depending on the initial removal rate observed, weather, and coordination with the other survey work. At the end of the 28-day period, any remaining trial carcasses and scattered feathers will be removed. Each trial will use as many bird carcasses as are available; the target is 10-20 carcasses.

3.0 SEARCHER EFFICIENCY TRIALS

The objective of searcher efficiency trials is to estimate the percentage of bird fatalities that searchers are able to find. Searcher efficiency will be estimated by habitat type and season. Estimates of searcher efficiency will be used to adjust carcass counts for detection bias. Searcher efficiency trials will be conducted on the fatality monitoring search plots in all habitat types.

Searcher efficiency trials will be conducted in each season as defined above, during the period in which the fatality monitoring occurs. Trials will be spread throughout the year to incorporate the effects of environmental variables such as weather and scavenger populations. Key elements of these trials include:

- At least three trials will be conducted in each season.
- Each trial will use a variable number of carcasses so that the searcher will not know the total number of trial carcasses being used in any trial.
- For each trial, birds will be used according to their availability.
- Wedge-tailed shearwater will be the primary species used for searcher efficiency trials.
- Personnel conducting searches will not know in advance when trials are conducted; nor will they know the location of the trial carcasses.

- Carcasses will be placed in a variety of postures to simulate a range of conditions. For example, birds will be: 1) placed in an exposed posture (thrown over the shoulder), 2) hidden to simulate a crippled bird and 3) partially hidden.
- Each non-domestic carcass will be discreetly marked and located with GPS at the planted site so that it can be identified as an efficiency trial carcass after it is found.
- The number and location of the efficiency trial carcasses found during the carcass search will be recorded.

If new searchers are brought into the search team, additional detection trials will be conducted to ensure that detection rates incorporate searcher differences.

4.0 SAMPLING INTENSITY AND DURATION

Search efforts will begin in mid-October and end in mid-December. Each tower will be checked twice per week, with no greater than three days between surveys. This will be very useful in increasing the efficiency of the study since scavenging rate detections will determine the appropriate search frequency. If scavenging is high, search frequency needs to be high (see Arnett 2005).

However, based on Service recommendations, carcass searches will be conducted approximately two times per week or no longer than 3 days apart during the initial scavenging trial. Once data from the initial scavenging trial has been evaluated, the frequency of carcass searches will be adjusted accordingly for effectiveness and efficiency for the remainder of the fall 2008 survey season, as approved by the Service. Additional surveys may be conducted after climatic conditions/events, such as storm events, fog, or moonless nights, as these events could increase the likelihood of collisions with broadcast towers.

Changed circumstances such as hurricanes, major storms, fire, and other such events may affect the timing of the surveys. If the broadcast towers are not accessible as a result of storm events or road conditions, and/or staff safety is questionable, the surveys will continue as soon as is safely possible. The Navy will coordinate with the Service on such changed circumstances as soon as possible.

5.0 ANALYTICAL METHODS FOR FATALITY ESTIMATES

Estimates of avian fatalities during the life of the broadcast towers are based on the following:

(1) The number of carcasses located during standardized searches for which the cause of death is attributed to the broadcast towers; carcasses found within survey plots are assumed to be the result of the broadcast tower unless other obvious indicators exist.

(2) Carcass scavenging rates expressed as the estimated average time a carcass is expected to remain in the study area and be available for detection by the searchers during the entire survey period.

(3) Searcher efficiency expressed as the proportion of planted carcasses found by searchers.

The following sections describe how the avian fatalities will be quantified.

5.1 Fatality calculations

The estimate of total fatalities is based on the number of fatalities found within the survey plots, confirmed to be attributed to the broadcast towers, and adjusted for the probability that the observer found the carcass and the time that the caresses remained to be found (i.e., was not scavenged). Calculations are based on Young *et al.* (2003) and are presented below.

5.1.1 Number of carcasses

The average number of carcasses per search period is calculated using:

$$\bar{c} = \frac{\sum_{i=1}^{k} c_i}{k}$$

where c_i is the number of carcasses found at broadcast tower i, and k is the number of broadcast towers searched.

Total number of carcasses found is calculated by:

$$C = k * \bar{c}$$

5.1.2 Searcher Efficiency

Searcher efficiency (p) was calculated as the proportion of the carcasses found by observers divided by the total number of carcasses available to find.

$$p = \frac{p(1-p)}{n}$$

5.1.3 Scavenging rate

The average number of days that a carcass remained on site is calculated using:

$$\bar{t} = \frac{\sum_{i=1}^{k} t_i}{k}$$

where t_i is the number of days each carcass remained on the study area and k is the number of carcasses evaluated.

5.1.4 Mortality estimate

The estimated total number of fatalities is calculated by

$$m = \frac{N * I * C}{k * \bar{t} * p}$$

where N is the total number of broadcast towers, I is the time between searches (days), C is that total number of carcasses during the study period, k is the number of broadcast towers searched, $\bar{t}$ is the mean length of time a carcass remained on the plot, and p is the searcher efficiency.

6.0 RESULTS

Fatality rates will be calculated on the project as a whole. Each season's percent searcher efficiency will be applied to the observed direct take (carcasses found, if any, during searches) to quantify adjusted take (direct and unobserved direct take combined). Variance will not be calculated pursuant to Service recommendation.

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Attachment 1

Downed Wildlife Protocol

DOWNED WILDLIFE PROTOCOL *

Downed birds (any seabirds, and or Hawaiian short-eared owl) considered here may be dead or injured at discovery. All need immediate attention by the discoverer.

A ***prioritized*** Contact List of Service and Division of Forestry and Wildlife (DOFAW) Staff follows, prioritized from first to last to contact. It is essential for you to actually speak with a person and not to rely on voicemail as "a contact"; however you may leave a message and then contact the next person in the listing.

DEAD BIRD:

- Leave in place, the Service or DOFAW will do site and circumstantial assessment, make photographs, and measurements before securing and removing bird.

- Contact Service about find; Call list for Service staff, in order for calling:
    1. Adam Griesemer 808-285-8261 or 808-822-2175
    2. Law Enforcement 808-861-8525

INJURED BIRD:

Equipment necessary to have available for response:

- Pet carriers (medium) – 2 available at minimum
- Cardboard small animal (rat/rabbit/hamster) carriers – 2 minimum
- Pieces of artificial turf/outdoor carpeting to place on floors of pet carriers
- Non-tippable shallow dog water-bowls for water; water
- Gloves
- Tent stakes (6)

Procedure

1. Gently pick up and place bird into carrier equipped with turf/carpet. Place only 1 bird in a carrier.
2. Mark exact spot of find(s) with tent stake(s).
3. Place the bird in the SOS aid station at PMRF, or transport to Kauai Humane Society if the bird was picked up after the SOS aid station was checked for the day.
4. DO NOT feed birds, provide water in bowl.
5. Notify the Service within 24 hours by telephone, using call list above, and by email - adam_griesemer@fws.gov.

Attachment 2

Avian Fatality Survey Form

Page ____ of ____

Downed Wildlife Survey

Location: _____ **Observer:** _____ **Date:** _____
Start Time: _____ **End Time:** _____

Environmental Conditions:

Cloud Cover:____ (**0**=about 25%, **1**=26-50%, **2**=51-75%, **3**=76-100%) **Temperature:**_____
Precipitation:____Rain____ Fog____Other____ (**0**=None, **L**=light, **M**=Moderate, **H**=Heavy, Other= Hail, Snow)
Wind:_____ **0**=<1 mph, **1**=1-3 mph (leaves barely move), **2**=3-7 mph (leaves rustle, small twigs move),
3=8-12 mph (sm. Twigs move), **4**=13-18 mph (sm. Branches move) **5**=12-24 mph (lg. Branches move trees sway)
Vegetation: Ave. ht. _____**(cm); Ave. vigor** _____ (**G** = Green, **M** = Mixed, **B** = Brown);
Cover _____% (% ground obscured by plant cover), record details in comments

Tower No.	Species	Sex	Age	Remains	Dir. From Tower	Dist. From Tower	UTM N	UTM E	Approx. Carcass Age	Photo nmbrs	Vegetation Type	Comments

Species: 4-letter code
Sex: sex of animal if known (**M** = Male, **F** = Female); **Age:** **A** = Adult, **S** = Subadult, **J** = Juvenile
Remains: **E**=Entire body, **W**=Wing, **F**=Feathers/Fur, **S**=feather spot (10 or more, or 3 primaries),**B**=Bones, **O**=Other (add to Comments)
Dir. From Tower: Compass direction of carcass from Tower base
Dist. From Tower: Distance (meters) of carcass from Tower
Carcass age: Approximate age in days of carcass remains
Comments: Print notes as needed

Attachment 3

Avian Injury / Mortality Form

Report Date:

Species (common name):

Date Found:

Time Found:

Age:

Bands:

Found by:

Documented by:

GPS Coordinates:

Location Found (including closest structure & distance to structure):

Condition of Specimen (include a description of general condition, as well as any visible injuries):

Probable Cause of Injury or Mortality and Supportive Evidence (attach photos and map, next page):

Action Taken (include notifications, reporting dates and times):

Additional Comments:

Appendix 2:

Newell's Shearwater Population Modeling to Inform the Biological Opinion for the Pacific Missile Range Facilities Base-wide Infrastructure, Operations, and Maintenance Activities.

Photo Credit: Newell's shearwater, Tracy Anderson, Save Our Shearwaters Program.

Prepared By:

Adam Griesemer
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Suite 3-122
Honolulu, Hawaii 96850

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1.0 INTRODUCTION

The primary purpose of this modeling assessment was to estimate the effects on the Newell's shearwater population likely to be caused by the Pacific Missile Range Facility (PMRF) Base-wide Infrastructure, Operations, and Maintenance Activities over the 50-year term of the biological opinion, absent the predation management actions proposed by the U.S. Department of the Navy (Navy). This modeling assessment differs from the stochastic and geographic assessments developed by the Service (USFWS 2017a) which inform Newell's shearwater strategic habitat conservation on the island of Kauai. This assessment is not meant to comprehensively analyze the variability of all major threats to Newell's shearwater and their potential range of effects on the species population viability as in USFWS (2017a), rather it assesses only the impacts of fallout and tower collision mortalities likely to be caused by PMRF activities on the Newell's shearwater population in the consultation action area. The action area spans the western region of Kauai (as described in the biological opinion), therefore this assessment focuses on a meta-population of shearwaters breeding within the Kauai (island-wide) population. Although this assessment uses a deterministic modeling approach, the stochastic and geographic analyses in USFWS (2017a) informed selection of inputs (demographic parameters) to model the current condition of the Newell's shearwater population in the action area and the Kauai population.

A secondary purpose of this assessment was to estimate the beneficial effects of predator management in nesting colonies specific to PMRF's proposed predation management actions. The effects of different predators on nesting colonies were partitioned based on approaches used in the Service's mitigation efficacy calculator (USFWS 2017a). The assessment was further defined to a meta-population (a sub-set of pairs breeding in colonies within the action area population) for the purposes of scaling management to the number of breeding pairs that will be supported by predator management funded by the Navy.

The objectives of this modeling assessment were the following: 1) estimate the additional decline associated with seabird fallout and seabird tower collisions likely to be caused by PMRF activities on the Newell's shearwater population occurring in the action area; 2) calculate the total (accumulated) take in terms of additional seabird fallout and additional seabird tower collisions likely to be caused by PMRF activities over 50-years; and 3) determine the increase in fledgling production from implementing predator management at nesting colonies as discussed in the biological opinion.

2.0 METHODS

The Service relied on deterministic demographic modeling to calculate Newell's shearwater population assessment metrics for growth rate, population loss, and endpoints (e.g., timing to population extinction). Deterministic population modeling was performed in PopTools v3.2 (Hood 2011) using stage-based Lefkovitch matrices. The stage-based matrices were based on survival (juvenile, sub-adult, and adult), fecundity, and an age of first breeding of six years old (Ainley *et al.* 2001), as illustrated in Figure 1.

$$N_t \left\{ \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 & F_a \\ S_0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & S_1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & S_2 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & S_3 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 & S_4 & 0 & 0 \\ 0 & 0 & 0 & 0 & 0 & S_5 & S_a \end{bmatrix} \right\}$$

Figure 1. Population matrix of stage-based model. Nt is the stage-specific population size at time t, S is the age specific survival at ages 0, 1, 2, 3, 4 ,5 and adult (6+), and F is fecundity (proportion of females in population, breeding probability, and reproductive success).

2.1 Modeling Scenarios

The first modeling scenario was developed for the purposes of comparing model projections of population decline to trends in breeding activity garnered from ornithological radar monitoring data (i.e., to check if the projection of the baseline for the Kauai population makes biological sense).[1] This served as a method to corroborate our selection of demographic parameters and our characterization of threats to the Kauai population and action area population (*See* section 2.3). A model of the current condition of Kauai Newell's shearwater population was developed for this scenario.

The second modeling scenario was developed to project the additional decline likely to be caused by impacts from PMRF lighting and communication towers over the 50-year term of the proposed action on the Newell's shearwater population occurring in the action area due to the effects of (a) additional seabird fallout due to light attraction and (b) additional seabird/tower collision mortalities. In order to estimate this decline, we first developed a model to assess the current condition of the population in the action area (the Environmental Baseline), then added the impacts of the additional seabird fallout and tower collisions to the current condition. Thus, two models of population projections were considered in this second scenario, including "Environmental Baseline" and "Environmental Baseline with PMRF Activities."

The third modeling scenario was developed to estimate the beneficial effect of PMRF's proposed predator management at breeding sites on the population in the action area. We expressed the effect of management as a change in the number of fledglings produced by the breeding pairs that would be directly affected by the management. We considered management that decreased predation by removing predators, including feral cats (*Felis catus*), pigs (*Sus scrofa*), rats (*Rattus spp.*), and barn-owls (*Tyto alba*). We expressed the efficacy of the management by decreasing predation of individuals and nests proportionally (considering that management would be 70-90% effective in reducing predation) such that 80% management efficacy meant that out of 20 burrows with chicks or eggs depredated in the absence of management, predator removal would reduce the number of depredated burrows to 4 (20 percent of 20 burrows). One meta-population

[1] Radar has been used to monitor the summer movement patterns of Newell's shearwaters in coastal areas of known seabird flyways in May through mid-July, during the incubation and early chick-rearing stage, which provides a conservative index of breeding activity.

at breeding sites in the action area equal to 50 breeding pairs was considered for this scenario as discussed in the biological opinion. We produced one management model for this scenario:

> (i) "Predator Control" decreasing predation by feral cats, pigs, and rats (70-90% efficacy) for 50 breeding pairs.

Although predator management was ongoing in 2017 at two Newell's shearwater breeding sites under management of the Kauai Island Utility Cooperative (KIUC), no long-term mitigation or minimization measures have been approved by the Service for inclusion in a long term HCP and associated Incidental Take Permit (ITP). Therefore, all of the scenarios and management models considered in this assessment could not and did not assume ongoing or long-term colony management by KIUC HCP.

2.2 Modeling Approach

To model the above the scenarios, we adjusted demographic parameters of a Growth model[2]; the growth of the population in the absence of predation by non-native predators, fallout, power line, and tower collisions (i.e., threats). In Scenario 1 and Scenario 2, we added threats that decreased demographic parameters to define the current condition in the Kauai population and the action area population, respectively. In Scenario 3, we added predation management to one meta-population in the action area as discussed in the biological opinion (one meta-population equal to 50 breeding pairs) which removed a proportion of the decrease in the parameters due to predation.

We determined that adjustments from a growth model, rather than a stable population model, are appropriate for this assessment, based on lambdas (λ) (i.e., model output) produced using monitoring data from the Upper Limahuli nesting colony. The data suggests the potential for Newell's shearwater population to achieve a high breeding probability and reproductive success as a result of intensive predator control and ungulate exclusion at breeding sites.[3] Although breeding sites within Upper Limahuli are not free of terrestrial predators and constant removal of predators is required to maintain high reproductive performance, the high breeding probability and reproductive success rates combined with best estimates of survivorship (Section 2.4.4 Annual Survivorship) produced a growth rate of at least 1.016.

2.3 Data Quality

We compiled the best available data to develop inputs to demographic parameters for our modeling scenarios including the population size, age at first breeding, survivorship of adults, sub-adults, and juveniles, reproductive success, and breeding probability.[4] Table 1 summarizes the studies and data used that provided direct measures of demographic information. Significant resources for this information on Newell's shearwater and analogous species were found in Ainley *et al.* (2001), Griesemer and Holmes (2011), and USFWS (2017a).

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[2] A growth model has an output, lambda (λ), greater than one (1).

[3] The Kauai Endangered Seabird Recovery Project provided the Service summarized empirical data in 2014 to assist the Service with information to update Newell's shearwater demography and parameters in Service population modeling (KESRP unpublished data 2014).

[4] A general description of Newell's shearwater demographic information is included in the main text of the Biological Opinion, Status of the Newell's Shearwater, section *iv*.

Model development of the current condition of the Kauai Newell's shearwater population and the action area population (Environmental Baseline) required estimating the effects of major threats on the population, including collisions with power lines, light attraction/fallout, and predation.[5] To develop models for additional fallout and tower collisions due to PMRF activities, we relied on data used for our analysis of these effects in the biological opinion. The beneficial effects on colony productivity from predator management were also investigated in the modeling. The monitoring data that we relied on to model these threats and colony management are summarized in Table 1.

[5] A general description of threats to the Newell's shearwater population is included in the main text of the Biological Opinion, Status of the Newell's Shearwater, section v.

Table 1. Data Quality for Newell's shearwater Modeling Inputs

Measure	Direct		Indirect
	Recent (≥2010)	**Historic (<2010)**	**Estimated from Analogous Species**
Basic Life History			
Adult Survival			Griesemer and Holmes 2011, USFWS 2017a
Juvenile/Sub-adult Survival			Ainley *et al.* 2001
Reproductive Success		Kalaheo colony 81-85, 93-94	
Breeding Probability		Kalaheo colony 81-85, 93-94	
Age of first breeding			Ainley *et al.* 2001
Population Size	NOAA surveys 98-11	At-sea studies 80-94	
Threat Rates			
Power line Collision	KIUC UMP studies 14-15	EPRI studies 93-94	
Fallout	SOS Database 10-15	SOS Database 79-10, EPRI studies 93-94	
Predation	Hono o Na Pali 11-13 Predation Mortalities	Kalaheo colony 81-85, 93-94	
PMRF Fallout	SOS Database 14-15, PMRF Monitoring 14-15	SOS Database 07-10	
PMRF Comm. Tower Collision	PMRF tower surveys 10, 15		
Colony Management			
Adult Survival			Griesemer and Holmes 2011, USFWS 2017a
Juvenile/Sub-adult Survival			Griesemer and Holmes 2011, USFWS 2017a
Reproductive Success	Hono o Na Pali 13-15, Upper Limahuli 11-15		
Breeding Probability	Hono o Na Pali 13-15, Upper Limahuli 11-15		

2.4 Demographic Parameters

2.4.1 Population Size and Age of First Breeding

The most recent assessment of population size, based on survey data collected by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA-NMFS) Southwest and Pacific Islands Fisheries Science Centers from 1998 to 2011, estimated the total Newell's shearwater population at 27,011 (95% CI = 18,254-37,125) including juveniles and sub-adults (Joyce 2013). Previous assessments of population size estimated the total Newell's shearwater population at 84,000 (95% CI = 57,000-115,000) including juveniles and sub-adults, based on at-sea surveys conducted in the central and eastern tropical Pacific between 1980 and 1994 (Spear *et al.* 1995). Estimates indicate a significant percent of the global population resides on Kauai (Ainley *et al.* 1997). For the purposes of our modeling, we adjusted Joyce's (2013)

estimate for the population breeding on other islands (10% in Griesemer and Holmes 2011) producing an estimated Kauai Newell's shearwater population of 24,310 individuals (USFWS 2017a, p. 113).

Our models used an age of first breeding of 6 years of age, consistent with other Newell's shearwater modeling efforts (Ainley *et al.* 2001; Griesemer and Holmes 2011; and USFWS 2017a). Ainley *et al.* (2001) reported this breeding age, based on the timing of recoveries of banded Newell's shearwater of known age and the average of empirical data from the closely related Manx shearwater (*Puffinus puffinus*) (Brooke 1990). The percentage of the population that is breeding age (6 years of age or older) is estimated at 0.637 (Ainley *et al.* 2001, p.115), equaling a Kauai Newell's shearwater adult population of 15,485 individuals.

The initial population size in the action area was projected using a methodology similar to those employed in USFWS (2017b), based on statistical analyses of Newell's shearwater calling data from auditory surveys conducted by the Kauai Endangered Seabird Recovery Project (KESRP). The populations in all occupied nesting areas of Kauai were partitioned from the current Newell's shearwater population estimate (Joyce 2013). The subset of the meta-population within the action area provided an estimate of the initial population size (8,508 individuals). Of these individuals, 5,420 (63.7%) are assumed to be adults (Ainley *et al.* 2001).

2.4.2 Breeding Probability

Ainley *et al.* (2001) estimated breeding probability between 0.60 and 0.50 based on monitoring data from the Kalaheo nesting colony on the island of Kauai (Ainley *et al.* 2001, p. 118). This breeding probability is markedly lower than the breeding probability (0.82) of other Procellariidae species (Griesemer and Holmes 2011), likely the result of high mate loss due to predation (Ainley *et al.* 2001), the presence of predators at unprotected burrows reducing breeding attempts, or other threats affecting individual fitness. Adults that lose a mate cannot obtain a new one quickly and have been observed not to breed the following season.

Between 2011 and 2015 at breeding sites in Upper Limahuli, where the largest set of burrows are known, the percentage of active burrows (i.e., confirmed breeding) ranged from 0.76 to 0.87 (Raine and McFarland 2013, Raine and McFarland 2014, Raine and Banfield 2015a, Raine *et al.* 2016a).[6] During this period, the number of burrows monitored by KESRP in Upper Limahuli increased from 15 (2011) up to 82 (2015). An average of 92 percent of burrows was active in 2012 and 2013 out of a subset of 31 burrows known to have previously hosted breeding pairs (KESRP unpublished data, 2014). Ongoing predator management at Upper Limahuli likely influenced a reproductive performance consistently higher than previously measured at Kalaheo.

Based on the information above, we used a breeding probability of 0.90 for our Growth model (Table 2). The 90% breeding probability is consistent with analogous species for which long-term measures of breeding probability are available: 86-90% (n=15 years) in Cory's shearwater (*Calonectris diomedea*) (Mougin *et al.* 1997) and 86% (n>40 years) in short-tailed shearwaters (*Puffinus tenuirostris*) (Bradley *et al.* 2000). Adjustments to breeding probability to account for

[6] KESRP confirms breeding status through presence of (1) adult during day in June or July, (2) an egg or eggshell fragments, or (3) chick.

negative effects of predation and beneficial effects of predator management are described in corresponding sections.

2.4.3 Reproductive Success

Using data collected in a five-year monitoring study (1981-1985) of the Kalaheo nesting colony, Ainley *et al.* (2001) estimated an annual reproductive success of 0.66 fledglings per breeding pair. In the years of the study, predation primarily consisted of adults and sub-adults rather than chicks. Over a recent five year period (2011-2015), the reproductive success of Newell's shearwater pairs ranged between 0.68 and 0.88 within Upper Limahuli (Raine *et al.* 2016a, p. 16), where breeding pairs received intensive predator control to reduce chick mortalities. In comparison, the Manx shearwater, a closely related species with an extensive range and a stable global population, has a reproductive success of 0.70 (Brooke 1990, Ainley *et al.* 2001). Brooke (1990) measured the 0.70 success rate at Skolkhom Island colony where non-native predators have not occurred at nest sites.

The Service used 70% in our Growth model (Table 2) to represent mean, long-term reproductive success in predator free conditions, consistent with Griesemer and Holmes (2011) and USFWS (2017a). This is based on the mean reproductive success and long-term studies of other Procellariidae species (n=44 studies); Griesemer and Holmes (2011) considered that 0.70 reproductive success represents an upper end of Newell's shearwater mean, long-term reproduction. In the USFWS (2017a) assessment of variance in Newell's shearwater reproductive success, 0.70 was approximately the upper quartile boundary of the boxplot representing mean reproductive success without predation. Adjustments to reproductive success to account for negative effects of predation and fallout and the beneficial effects of predator management are described in corresponding sections.

2.4.4 Annual Survivorship

Annual survivorship of adult Newell's shearwater has not been directly measured in field studies (Ainley *et al.* 2001, USFWS 2017a). Adult survivorship of Procellariidae species is related to body mass, where adults with a greater body mass exhibit a higher likelihood of survival, all else being equal (Croxall and Gaston 1988, p. 1184). Based on this allometric relationship and linear regression of the log of adult body size to survivorship data from closely related Procellariidae species, previous modeling studies estimated Newell's shearwater adult survivorship at 0.905 (Ainley *et al.* 2001, p. 116) to 0.920 (Griesemer and Holmes 2011, p. 20). An updated linear regression assessment incorporating additional field-derived adult survivorship data from other Procellariidae species estimated Newell's shearwater adult survivorship at 0.920 (USFWS 2017a). We used an adult survivorship of 0.920 for our Growth model (Table 2) consistent with the Service's updated assessment (USFWS 2017a) and Griesemer and Holmes (2011).

Based on long-term survivorship data from the Manx shearwater, we estimated the likelihood of a Newell's shearwater fledgling surviving to adulthood (0.333) (Brooke 1990). We followed methods of Ainley *et al.* 2001, to develop age specific survivorships, consistent with other studies (Griesemer and Holmes 2011, USFWS 2017a). For our Growth model (Table 2) we used age specific survivorships of 0.654 (age 0-1), 0.78 (age 1-2), 0.89 (age 2-3), and 0.905 (ages 3-4, 4-5, and 5-6). Adjustments to the adult and sub-adult survivorship for the effects of predation,

power line collisions, communication tower collisions, and predator management are described in corresponding sections.

Table 2. Adjustments from growth modeling for all Newell's shearwater model scenarios.

		Breeding Probability	Reproductive Success	Survivorship (age)						
				0 to 1	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6	Adult (6+)
Growth Model		0.9000	0.7000	0.6540	0.7800	0.8900	0.9050	0.9050	0.9050	0.9200
Predation		-0.3000	-0.2000			-0.0242	-0.0242	-0.0242	-0.0242	-0.0425
Power Line Collision	Low					-0.1570	-0.1570	-0.1570	-0.1570	-0.0168
	Medium					-0.2174	-0.2174	-0.2174	-0.2174	-0.0232
	High					-0.2778	-0.2778	-0.2778	-0.2778	-0.0297
Fallout	Low		-0.0358							
	Medium		-0.0460							
	High		-0.0562							
PMRF Fallout	Action Area Pop.		-0.0044							
PMRF Comm. Tower Collision	Action Area Pop.									-0.0092
Predation with cats, rats, pigs & barn-owls controlled	70% Effectiveness	-0.0900	-0.0600			-0.0073	-0.0073	-0.0073	-0.0073	-0.0128
	80% Effectiveness	-0.0600	-0.0400			-0.0048	-0.0048	-0.0048	-0.0048	-0.0085
	90% Effectiveness	-0.0300	-0.0200			-0.0024	-0.0024	-0.0024	-0.0024	-0.0043

2.4.5 Power Line Collision

For purposes of this assessment, we relied on modeled estimates in USFWS (2017a) which extrapolate the amount of Newell's shearwater collisions with power lines documented by the KIUC Underline Monitoring Program (UMP) to the entire power line system, encompassing power lines and infrastructure in the central, eastern, northern, southern, and western portions of the island of Kauai.

In the Kauai Population model, we used the island-wide collision estimate of 1,800 Newell's shearwater mortalities per year, the rounded averages of selected scenarios for the 2014 and 2015 projections (USFWS 2017(a), p.123). This data set was used to scale collision levels such that the minimum, average, and maximum values represented low collision mortality (1,300), medium collision mortality (1,800), and high collision mortality (2,300) in that order. We separated the strike estimates into age classes using an adult to sub-adult ratio (80:20) of Newell's shearwater carcasses collected under power lines during standardized searches (Ainley *et al.* 2001), consistent with previous assessment methods (USFWS 2017a; Griesemer and Holmes 2011). The adult mortalities at low, medium, and high collision levels (260, 360, and 460) equaled 1.68%, 2.32%, and 2.97%, respectively, of the total Kauai adult population of 15,485. The sub-adult mortalities for the collision levels (1,040; 1,440; and 1,840) equaled 15.70% (low), 21.74% (medium), and 27.78% (high) of the total Kauai sub-adult population of 6,624 [24,310 minus adults (15,485) and 2,200 one-year olds at sea (0.09% of Kauai population; Ainley *et al.* 2001)]. We reduced the adult and sub-adult survivorship according to these percentages to account for power line collision in the Kauai population (Table 2). These estimates are substantially greater than previously modeled estimates in Ainley et al. (2001), based on 1993-1994 Electric Power Research Institute studies.

The Service's modeled estimates of the annual number of collisions per line segment were used to characterize power line threats to the Newell's shearwater in the consultation action area for the Environmental Baseline model. Figure 2 illustrates the annual number of collisions, including both Newell's shearwater and Hawaiian petrel (*Pterodroma sandwichensis*) projected across transmission power line segments, based on power line exposure heights, least cost path flyways, and modeled UMP data (USFWS 2017a). The relative likelihood of two of the seabird species on the island of Kauai affected by power lines is 0.81 Newell's shearwater and 0.19 Hawaiian petrel (USFWS 2017a). Under the scenarios selected in the USFWS Newell's Shearwater Landscape Strategy Appendix 2 (2017a, p. 123) estimate of 1,800 mortalities (scenarios IV, VB, VIA), approximately 15% of Newell's shearwaters that strike power lines die as a result of the collision. According to the distribution of collisions across power lines depicted in Figure 2, less than five strikes per year per line segment are anticipated in the action area; however, low to moderate levels of strike are anticipated to occur at specific line segments in the Waimea and Kekaha. On the basis of the estimated number of strikes per segment in the action area (Figure 2), that 81% of strikes are Newell's shearwaters, and that 15% of those strikes result in mortality, the Service applied the low rates of collision to the action area population in the Environmental Baseline model. We reduced survivorship of adults in the action area by 1.68% and sub-adults by 15.7%.

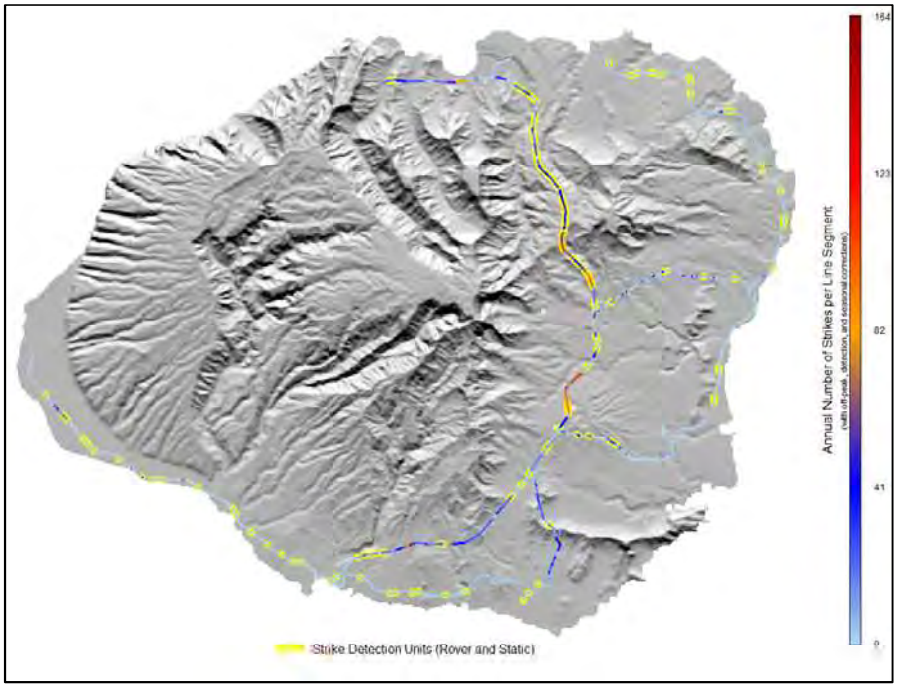

Figure 2. Map of projected annual power line collisions of Newell's shearwater and Hawaiian petrel per power line segment from USFWS (2017a). Strike detection units, shown in yellow, represent locations of song meter units in 2015.

2.4.6 Predation

We developed current estimates of predation at breeding sites using recent data collected in 2011-2015 by the KESRP at the Hono o Na Pali nesting colonies. The Service estimated adult and chick predation (differential predation) using estimates of mortalities for an unmanaged colony, based on observations during seabird colony monitoring in 2011 to 2013 (KESRP unpublished data 2014).[7] We estimated that approximately 29 chicks and 17 adults are predated by cats, rats, pigs, and barn-owls in an unmanaged colony with a meta-population of 400 breeding adults (Table 3). Assuming that this meta-population, predator-free, would produce 125 chicks (0.90 breeding probability and 0.70 reproductive success), the 29 chicks represent 20% of the total chicks produced. We reduced reproductive success for predation by 0.20 in our Kauai Population model and Environmental Baseline model (Table 2), consistent with moderate rates of chick predation estimated in Griesemer and Holmes (2011). To account for the predation of adults, we reduced adult survivorship by 4.25% (17 out of every 400 adults) in these models (Table 2). This adult mortality rate suggests that the extent of adult Newell's shearwater predated by cats, pigs, and barn-owls is substantially higher than observed at the Kalaheo colony (which was 1%) (Ainley *et al.* 2001) or considered in threat models by Griesemer and Holmes (2011).

Although differential predation estimates were derived from data collected in the 2011 to 2013 breeding seasons, the predation of adult and nestling shearwaters has continued to occur at the Hono o Na Pali colony in 2014 and 2015. At least eleven Newell's shearwaters from over 20

[7] USFWS (2017a) used the same predation data to develop demographic variables for Leslie matrices, referred to as KESRP Defined Predation, and transformed variables to proportional estimates for 100 breeding pairs.

shearwater burrows monitored by KESRP were predated by cats, consisting of eight adults and three nestling shearwaters (Raine *et al.* 2016b, 2016c, 2016d). At one burrow in 2015, a cat was documented on camera killing an adult Newell's shearwater and its nestling over two consecutive nights (Raine *et al.* 2016c). In 2014, at nesting colonies within Hono o Na Pali, rats predated 11% of burrows (n=14 of 125) where breeding of Newell's shearwater or Hawaiian petrel was confirmed (Raine and Banfield 2015b, 2015c, 2015d). These predation events provide further evidence of moderate to high levels of predation of adults and chicks in unmanaged seabird colonies.

Table 3. Estimated number of Newell's shearwaters predated by cats, pigs, rats, and barn-owls in a colony not receiving predator management, assuming a meta-population of 400 breeding pairs.

Predator		
	Adults	**Chicks**
Cat	8	8
Pig	8	8
Barn-owl	1	0.5
Rat	0	12
Total	**17**	**28.5**

On the basis of the adult mortality data from Hono o Na Pali nesting colony and the breeding probability reported in Ainley *et al.* (2001), we used a breeding probability of 0.60 for the Kauai Population model and Environmental Baseline model, reducing by 0.30 to account for mate loss due to predation, the presence of predators decreasing breeding attempts, and other factors affecting individual fitness (Table 2).

We also estimated reductions in survivorship of sub-adults which are susceptible to predation when returning to nesting colonies to prospect and form pair bonds (Warham 1996). We considered a stable-age distribution (Ainley *et al*. 2001; USFWS 2017a, p. 121) to estimate an additional 36.3% of the adults predated are sub-adults (2 to 5 years old), and reduced sub-adult survivorship by 2.42% in our Kauai Population model and Environmental Baseline model (Table 2). In an unmanaged colony with 400 breeding adults (above) this corresponded to an additional 228 sub-adults at risk of predation by cats, rats, pigs, and barn-owls. Based on this sub-adult mortality, we estimated 22 out of the 228 sub-adults are predated, totaling the 2.42% across each age (2-3, 3-4, 4-5, and 5-6 years old).

2.4.7 Fallout

Our estimates of lighting impacts to the Kauai Newell's shearwater population and action area population are based on Save Our Shearwaters (SOS) program recoveries of Newell's shearwaters that have been disoriented by lighting and grounded (referred to as "fallout"). Fallout was modeled as a reduction in breeding success at low, medium, and high levels, relying on the methodologies followed in other deterministic Newell's shearwater modeling studies (Griesemer and Holmes 2011, Ainley *et al.* 2001). We estimated the proportional decrease in the chick production of the population, assuming predation also impacted production (Griesemer and Holmes 2011). Recent results of satellite tagging studies of fledglings released by the SOS

program were considered in selecting an appropriate fallout level for the Kauai population model.

The five year average fallout (2011-2015) was 142 Newell's shearwater fledglings, based on the number of fledglings recovered by the SOS program.[8] We used a 50% discovery rate to estimate the percentage of the total birds found and recovered by the SOS program (Ainley *et al.* 2001). The 17th, 50th, and 83rd percentiles of the range of fallout recorded in 2011 to 2015 (142-284 fledglings) represented low, medium, and high fallout mortalities. The proportional decrease in the total chick production (lowered for predation) of the Kauai population equaled 3.6%, 4.6%, and 5.6% using an average fallout of 166 (low), 214 (medium), and 261 fledglings (high) (Table 2).

Research was conducted in 2014 and 2016 to compare the survival of SOS-released shearwater fledglings to the survival of shearwater fledglings that naturally leave out to sea from montane breeding colonies. Although earlier years of the program did not always include bird banding prior to release, since 1979 a total of 24 Newell's shearwaters previously banded and released through the SOS program as fledglings have been recovered or re-sighted as adults (T. Anderson, personal communication, July 27, 2016). The SOS low re-sight numbers prompted the pilot studies conducted by KESRP in coordination with the U.S. Geological Survey, Western Ecological Research Center. The primary focus of the 2014 pilot study was to evaluate attachment technique and tagging technology. Results of the 2016 study indicated that the same percentage of birds (83.3%, n=12) survived beyond 14-days after release regardless of whether they naturally fledged to sea from Upper Limahuli or were SOS-retrieved fledgling birds. Fourteen days is expected to be the maximum time period in which a hatch-year bird would need to learn how to feed itself or succumb to starvation (Mougin *et al.* 2000), and it is the time period in which we would expect the hatch-year bird to succumb to any unknown injuries from being grounded, if those injuries were present (Raine *et al.* 2017a, p. 15). All SOS-released and naturally fledged hatch-year birds (n=12), successfully traveled to foraging grounds at-sea and exhibited normal movement patterns as indicated from tagging data (Raine *et al.* 2017a, p. 9). The SOS-released fledglings chosen for the 2016 tagging study were individuals that were submitted to SOS and deemed healthy (e.g., good release weight, plumage, body condition, and lack of physical injuries) and suitable for immediate release (within 0-1 days); therefore, the 2016 tagging study did not evaluate SOS-rehabilitation efficacy.

In 2016, 100 Newell's shearwater fledglings were handled by the SOS program, including 93 fledglings released and seven that were dead on arrival, died in care, or were euthanized (2016 DOFAW). Of the 100 fledglings handled by the SOS program, 63 (63%) were released to sea the same day or next day (DOFAW 2016). Another 30 fledglings were rehabilitated with time in care equal to or exceeding two days, then released to sea. Based on the above and the results of the 2016 pilot study, we estimate that at least 63 of the 2016 SOS-released birds are likely to survive at the same rate as fledglings that naturally fledged to sea (65.4%, Section 2.4.4 Annual Survivorship). The 63% SOS-release survival would lower the maximum mortality considered in our models from 261 to 172 (89 of the 142 fledglings (5 year average) survive). Thus, in our Kauai population model, we selected low fallout mortality (166 fledglings) and decreased

[8] The 5 year average excludes Newell's shearwater downed and recovered at PMRF facilities which were considered as additional threats in this assessment.

reproductive success by 3.6%; consistent with SOS-release survival resulting from tagging studies.

In the Environmental Baseline model, we estimated reductions to breeding success based on the amount of fallout fledglings recovered by SOS in the action area, including Port Allen, Hanapepe, and Waimea aid stations. The Newell's shearwaters recovered at these aid stations in 2012 through 2015 equaled up to 27% of the total recovered by SOS.[9] Given the percentages of fallout in the action area and information on SOS-release survival above, we selected the low rate, and decreased breeding success of the population in the action area by 3.6%.

2.4.8 PMRF Fallout and Communication Tower Collisions

To adjust demographic parameters for PMRF activities, we relied on our analysis (included in the Effects of the Action section of the biological opinion) of the average annual fallout at PMRF sites and fatalities at PMRF towers located at Kokee Site C. We used data on the number of Newell's shearwater downed at PMRF sites and recovered by SOS in 2014-2015 to model impacts from fallout which is anticipated to be reflective of lighting conditions over the 50-year term of the biological opinion. As part of the Service's collision risk assessment for PMRF communication towers, we evaluated direct measures of mortalities at PMRF communication towers (Kleidosty Pacific 2011; Kleidosty Pacific 2016) and developed a collision model to estimate Newell's shearwater fatalities from PMRF towers located at Kokee Site C. The collision model (Appendix 1 of the biological opinion) is based on a template modified from Sanzenbacher and Cooper (2013), incorporating updated seabird movement rates in the action area and tower characteristics.

We calculated the anticipated proportional decrease in the chick production associated with Newell's shearwater fallout due to lighting at PMRF facilities to further adjust reproductive success for PMRF fallout in the Environmental Baseline with PMRF Activities model. The average annual fallout of seven Newell's shearwater fledglings at PMRF sites further decreased reproductive success by 0.44% in the action area population (Table 2).

We used the medium fatality estimate of 50 adult Newell's shearwater per year to further adjust adult survivorship for collisions with PMRF communication towers. We reduced adult survivorship by 0.918% to account for the additional impact on the adult population in the action area (50 out of 5,420 adults) in the Environmental Baseline with PMRF Activities model (Table 2).

The Service estimated the number of Newell's shearwater chicks or eggs that are likely to be killed per year as a result of its parent colliding with a PMRF communication tower, based on the annual number of adult collisions (0.918% of adults in action area) and the reproductive rates of the action area population in the Environmental Baseline model (breeding probability of 60% and reproductive success of 46.4%).

2.4.9 Predator Management

[9] Beginning in 2012, the specific number of Newell's shearwaters recovered from each aid station was summarized in SOS reports (KHS 2013, 2014, 2015, 2016); thus, the amount of fallout at Port Allen, Hanapepe, and Waimea aid stations in previous years was omitted from current condition section for purposes of reporting consistency.

We adjusted the reduction for predation in demographic parameters in our Predator Control model (Table 2). The predation effect on demographic parameters was decreased by 70%, 80%, or 90% in the Predator Control model. The Service considered 80% efficacy achievable in nesting habitat (providing sufficient funding), based on Newell's shearwater reproduction measured in Upper Limahuli nesting colony which suggests a very high efficacy in decreasing the number of active burrows predated by feral cats, pigs, rats, and barn-owls (Raine and Banfield 2015a, Raine *et al.* 2016a). Predator management that achieves 80% effectiveness (from the removal of feral cats, pigs, rats, and barn-owls) increased breeding probability to 84%, reproductive success to 66%, adult survival to 91.2%, and fledgling to adult survival to 32.9%.

3.0 RESULTS

3.1 Environmental Baseline and Kauai Population Models

The lambdas (growth rate) for all threat combinations considered in the development of the Environmental Baseline model and the Kauai population model are shown in Table 4. In the absence of predation, power line, and fallout threats, the demographic parameters of the growth model produced a lambda of 1.016. Predation produced a decline of 7.4% per year ($\lambda = 1.016 - 0.942$). Power line mortality produced declines of 5.2% (low), 7.0% (medium), and 8.8% (high) per year. Fallout produced declines of 0.4%, 0.5%, and 0.6% per year at low, medium, and high levels, respectively.

The Environmental Baseline model with predation, *low* power line collision, and *low* fallout resulted in an annual decline in the action area population of -10.3% (λ of 0.897). The Kauai Population model with predation, *medium* power line collision, and *low* fallout resulted in a population decline of -11.7% per year (λ of 0.883). This decline in the Newell's shearwater Kauai population is comparable to the mean annual rates of decline indicated by ornithological radar data for the island of Kauai (-12.5%) over the 20-year period 1993-2013.[10] This rate of decline is also within the range of annual declines reported in stochastic Newell's shearwater population models which incorporated variability in mortality and climate change (USFWS 2017a, p 159).

Table 4. Growth rates for Newell's shearwater without predation (none) and with predation (unmanaged colony) under none, low, medium, and high levels of fallout and power line mortality.

				Power Line Collisions			
				None	*Low*	*Medium*	*High*
Predation	*None*	**Fallout**	*None*	1.016	0.964	0.946	0.928
			Low	1.013	0.962	0.944	0.927
			Medium	1.012	0.961	0.943	0.926
			High	1.011	0.961	0.943	0.926

[10] The overall mean for shearwaters across all 13 radar sites on the island of Kauai surveyed in 1993 was 524 ± 207 targets/h and in 2013 was 34 ± 9 targets/h, representing a mean decrease of 94% between the two periods ($t = 2.37$, $P = 0.03$; Raine *et al.* 2017b). All of the 13 sites showed a large decrease in movement rates over the entire period, with movement rates at 12 (92%) out of 13 sites showing statistically significant declines (Raine *et al.* 2017b). Based on the radar data (Raine *et al.* 2017b) as a proxy for the breeding population, the Newell's shearwater population on the island of Kauai declined, annually, at a mean rate of 12.5 percent over the 20-year period.

Predation	*Unmanaged Colony*	**Fallout**	*None*	0.942	0.900	0.885	0.870
			Low	0.939	**0.897**	**0.883**	0.869
			Medium	0.938	0.897	0.882	0.869
			High	0.937	0.896	0.882	0.868

3.2 PMRF Activities added to Environmental Baseline

The accumulated effect of PMRF activities over a 50-year period of implementing the action is likely to result in the loss of 450 adults and 63 egg/chicks caused by PMRF communication towers and the loss of 63 fledglings due to PMRF lighting (Table 5). The number of Newell's shearwaters taken per year is anticipated to decrease each year, because as years pass in the implementation of the proposed action, the Newell's shearwater population in the action area is anticipated to decline by 11% (Environmental Baseline) and the proportion of individuals affected by the action in each respective age class (fledgling, sub-adults, and adults) of the action area population remains the same.

The fallout and seabird collision mortalities likely to be caused by PMRF lighting and communication towers increased the annual decline of the Newell's shearwater Environmental Baseline condition from -10.3% to -11.0% (a decrease in the growth rate from a λ of 0.897 to 0.890) (Table 6, Figure 3). By year 10 of implementation of the proposed action, the decrease in the baseline population in the action area likely to be caused by PMRF facilities was estimated to be 236 individuals [3,208 (action area population) – 2,971 (PMRF effects added to action area population)].

Table 5. Annual estimate of take and total (accumulated) take of Newell's shearwater that is likely to occur over the 50-year period of the proposed action.

		Annual	**50-year**
PMRF Lighting (Fallout)	fledglings	7	63
PMRF Communication Towers	adults & sub-adults	50	450
	eggs/chicks	7	63

Table 6. Lambdas and projected annual decline of (1) the action area population, including effects of predation, low fallout, low power line (Environmental Baseline), and (2) PMRF fallout and tower collision mortalities added to the action area population.

	Growth rate (λ)	**Projected Annual Decline**
Environmental Baseline (action area population)	0.897	-10.3%
Environmental Baseline with PMRF Fallout + Tower Collision	0.890	-11.0%

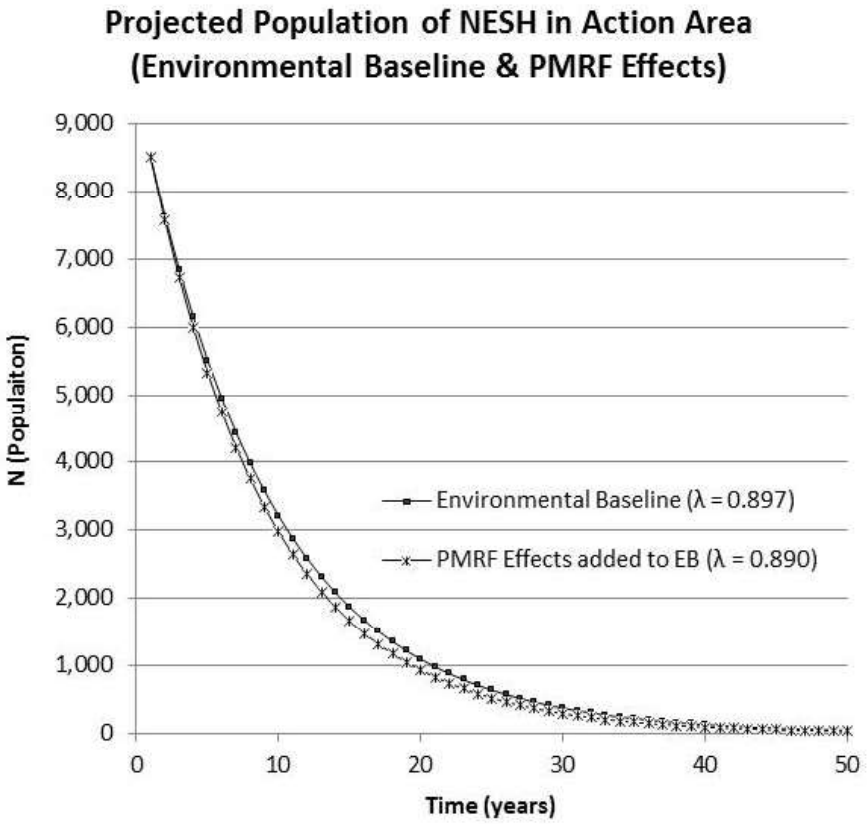

Figure 3. Newell's shearwater population in action area, including (a) growth rate associated with population in action area (Environmental Baseline, line-dots), and (b) growth rate for PMRF fallout and tower collisions added to the environmental baseline (line-crosses).

3.3 Predator Management

Decreasing predation by feral cats, pigs, rats, and barn-owls at 70%, 80%, and 90% efficacies resulted in lambdas of 0.995 (70% effectiveness), 1.002 (80% effectiveness), and 1.009 (90% effectiveness), respectively. Predator control at 80% effectiveness for 50 breeding pairs over 50 years (the term of the biological opinion) provided a reproductive benefit of 1,476 fledglings to the Kauai population (Figure 4).

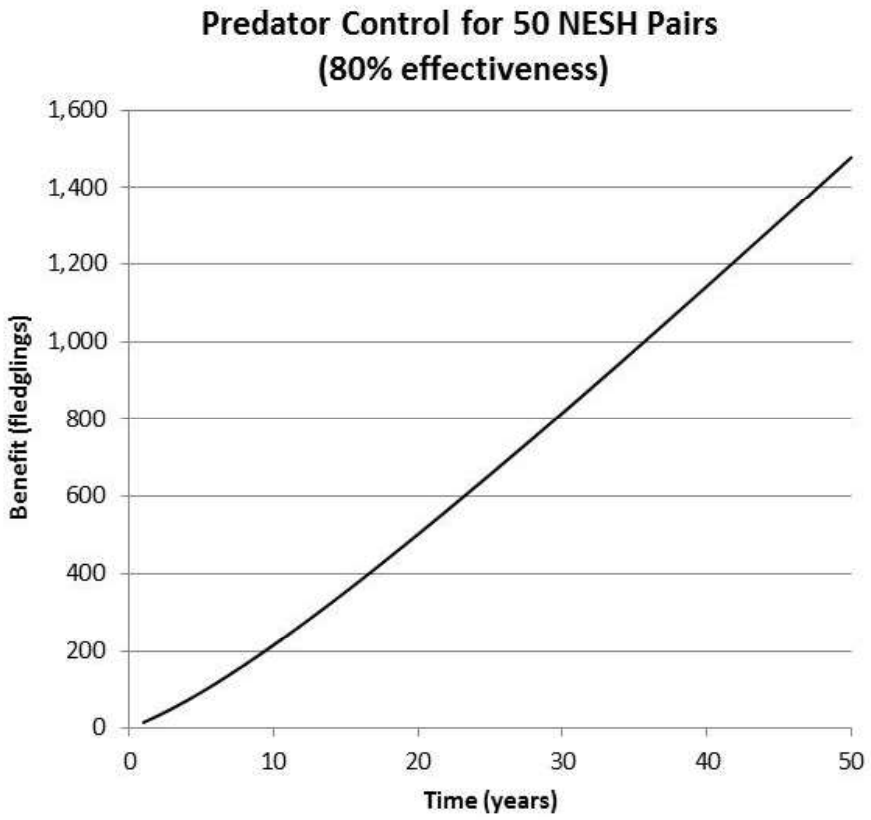

Figure 4. Projected fledgling benefit including control of cat, rat, pig, and barn-owl predation with 80% effectiveness for 50 Newell's shearwater breeding pairs.

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Biological Opinion for Base Infrastructure Operations and Maintenance at Pacific Missile Range Facility (PMRF) Sites on Kaua‘i, Hawai‘i

Photo Credit: Pacific Missile Range Facility

January 15, 2025
(2024-0133757-S7)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai‘i 96850

In Reply Refer To:
2024-0133752-S7

January 15, 2025

Brett A. Stevenson
Captain, U.S. Department of the Navy
Commanding Officer
Pacific Missile Range Facility
P.O. Box 128
Kekaha, Hawai‘i 96752-0128

Subject: Reinitiation of Formal Consultation for Base Infrastructure Operations and Maintenance at Pacific Missile Range Facility (PMRF) Sites on Kaua‘i, Hawai‘i

Dear Captain Stevenson:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion based on our review of the proposed base infrastructure operations and maintenance at Pacific Missile Range Facility (PMRF) sites on Kaua‘i, Hawai‘i, and its effects on the threatened Hawaiian goose or nēnē (*Branta sandvicensis*); the endangered Hawaiian stilt or ae‘o (*Himantopus mexicanus knudseni*), Hawaiian gallinule or ‘alae ‘ula (*Gallinula galeata sandvicensis*), Hawaiian coot or ‘alae ke‘oke‘o (*Fulica alai*), and Hawaiian duck or koloa maoli (*Anas wyvilliana*) (hereafter collectively referred to as Hawaiian waterbirds); and the endangered Hawaiian hoary bat or ‘ōpe‘ape‘a (*Lasiurus cinerus semotus*), in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.). Effects from these activities on the threatened Newell’s shearwater or ‘a‘o (*Puffinus newelli*), endangered Hawaiian petrel or ‘ua‘u (*Pterodroma sandwichensis*), and endangered Hawai‘i distinct population segment of the band-rumped storm-petrel or ‘akē‘akē (*Hydrobates castro*) (collectively referred to as Hawaiian seabirds) are currently addressed in the following biological opinions: 01EPIF00-2014-F-0066 and 01EPIF00-2015-F-0227.

The U.S. Department of Navy (Navy) formally requested reinitiation of formal consultation on this action due to changes in the project description and higher than anticipated take levels associated with vehicular driving that were addressed in the original biological opinion, dated September 9, 2014, for this action (01EPIF00-2014-F-0066). This biological opinion also considers the new listing status of nēnē, which was downlisted to threatened, including a section 4(d) rule of the Act associated with this species, effective on January 21, 2020 (hereafter referred to as the nēnē 4(d) rule).

Your initial request for reinitiation of formal consultation was received on December 15, 2021. The Service received an updated biological assessment for this action on April 25, 2024, with all information required to reinitiate consultation considered received on August 7, 2024.

This biological opinion is based on: (1) information provided in the April 25, 2024, biological assessment and associated appendices; (2) email and phone correspondence between the Service and Navy between April 25, 2024, and January 6, 2025; and (3) other sources of information available to us. A complete administrative record of this consultation is on file at the Pacific Islands Fish and Wildlife Office (PIFWO) in Honolulu, Hawai‘i.

CONSULTATION HISTORY

August 7, 2024: All information related to the proposed activities and reinitiation was considered received, therefore, formal consultation was considered initiated on this date.

August 16, 2024: The Navy emailed the Service to clarify the description of activities related to launches and live fire activities at PMRF Barking Sands.

August 20, 2024: The Navy requested to see a draft biological opinion before finalization.

August 22, 2024: The Service sent the letter of initiation of formal consultation to the Navy.

October 21-28, 2024: The Service and Navy exchanged emails to clarify descriptions of activities associated with hazing of nēnē near launch pads and vegetation maintenance occurring at the KIUC PV site at PMRF Barking Sands.

November 20, 2024: The Service sent the Navy a draft biological opinion and requested comments.

December 16, 2024: The Service and Navy met to discuss the Navy’s comments on the draft biological opinion. Both parties agreed to a 30-day extension of the final biological opinion from the date the Navy sends written comments to the Service.

December 31, 2024: The Service received the Navy’s written comments on the draft biological opinion.

BIOLOGICAL OPINION

Description of Proposed Action

The Navy’s PMRF is the largest instrumented multi-environment test range in the U.S. and

includes land, sea, and air zones. PMRF supports research, development, testing and evaluations (RDT&E) of air, surface, and subsurface weapons systems for Department of Defense (DoD) and other U.S. departments and agencies, foreign military forces, and private industry. PMRF maintains facilities and provides services to support Commander, U.S. Pacific Fleet (COMPACFLT) military readiness activities. PMRF's main base, located at Barking Sands, has areas for tracking and surveillance radars, launch pads, data processing, communication networks, and an airfield. In addition to the Barking Sands installation (hereafter referred to as PMRF Barking Sands or Barking Sands), PMRF is comprised of support facilities on Kaua‘i at Makaha Ridge (secondary range), Kōke‘e (tracking radars, telemetry, communications, command, and control), Kamokala Ridge (munitions storage), Port Allen (pier for weapons recovery and Navy Seaborne Powered Targets boats), and Miloli‘i Ridge (reflectors) (Commander Navy Region Hawaii 2010).

The scope of the proposed action considered in this biological opinion includes activities by PMRF personnel, tenants, facility users and contractors within all 6 aforementioned PMRF sites on Kaua‘i. The specific activities considered include the following, which will be described in the sections below: 1) air operations; 2) bird aircraft strike hazard (BASH) management activities; 3) hazing and nest removal near launch pads; 4) use of driving range and athletic fields; 5) oxidation pond management and upgrades; 6) vehicular driving; 7) vegetation maintenance; 8) construction activities; 9) hazing for bird protection and safety; 10) development of a hunting program; 11) predator control program; and 12) barbed wire fencing.

The term of the proposed action is 10 years. At the end of the 10-year term, the Navy will coordinate with the Service to reevaluate the biological opinion. If the proposed action has not substantially changed and reinitiation is not required, the Navy and Service will coordinate the possibility of extending the term for additional years.

<u>Air Operations – PMRF Barking Sands</u>
PMRF airfield supports Navy and U.S. Marine Corp activities at the forefront, but also provides opportunities for the Air Force, Air National Guard, and U.S. Coast Guard. This includes use of a variety of aircraft, including but not limited to C-17s, C-130s, C-40s, C-26s, and S-61 helicopters. Air operations are generally conducted Monday thru Friday during daytime hours with infrequent training exercises that involve evening and/or weekend operations. On average, the PMRF airfield accommodated 6,441 takeoff/landings annually between 2014 and 2020.

Currently, PMRF is limited to the number of landings/takeoffs allowed per the airfield pavement design and life cycle. In 2025, it is anticipated that the runway will be replaced to allow for additional flights and accommodate increased aircraft exercises from DoD agencies. Projections on future air operations at PMRF are detailed in Figure 1. This includes a projected increase in usage by C-17 cargo airplanes (from 176 passes per year to a projected 4,320 passes per year) and the ability to land MV-22 Osprey at PMRF.

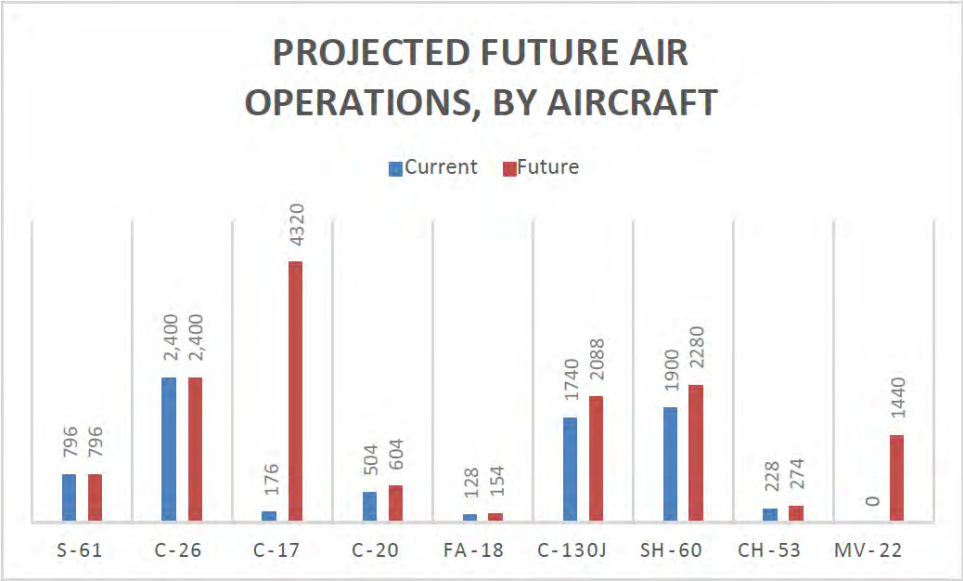

Figure 1. Projected annual air operations by aircraft at PMRF (passes per year).

<u>BASH Management Activities – PMRF Barking Sands</u>

Increasing populations of listed birds (e.g., nēnē) on Kaua‘i and an increase in air operations as previously described will escalate the risk and potential for bird-aircraft strikes. Bird aircraft strike hazard (BASH) management is a comprehensive approach to controlling and minimizing the impacts of hazardous wildlife to aircraft operations. BASH management requires the PMRF airfield (located at Barking Sands) to identify hazardous wildlife, hazardous wildlife attractants and associated management techniques to reduce or exclude hazardous wildlife from the airfield. Habitat modification, exclusion, use of repellents, harassment techniques and wildlife removal are the foundation of BASH management. PMRFs primary BASH management activities include: 1) habitat modification and exclusion; 2) BASH hazing for Hawaiian waterbirds; 3) BASH hazing for nēnē; and 4) the nēnē nest removal zone. These activities are described in the following subsections.

Habitat Modification and Exclusion

Habitat modification and exclusion focus on management of food/prey, cover or vegetation, and water resources to reduce the attractiveness of an area to hazardous wildlife. There are many wildlife attractants adjacent to PMRF Barking Sands, which are not managed by the Navy (i.e., Kawaiele Waterbird Sanctuary, agricultural lands and drainage ditches, Kekaha landfill, etc.). Wildlife attractants on PMRF property that can be managed for BASH include (by priority): Kinikini Ditch and ditch systems on base, maintained/irrigated grasses on base (specifically near the airfield), and unmaintained vegetation throughout PMRF Barking Sands where nēnē may nest on the fringe of the vegetation.

Proposed high priority habitat modification and exclusion projects include (Figure 2):

- Clear and maintain invasive vegetation along the coastal berm that is parallel to the runway (approximately 1-2 acres) to remove attractive nesting habitat. Vegetation adjacent to the runway consists of uneven terrain, which is managed via a ride-on tractor

with a blade attachment. Chainsaws are used, when necessary, to remove larger diameter vegetation.

- Maintain vegetation heights of 7-14 inches (in) around Kinikini Ditch to reduce foraging and nesting opportunities by nēnē. Maintain vegetation within the ditch's sloping embankment at 2-8 in.
- Cease irrigation or replace grass with synthetic turf near central base support facilities to reduce foraging opportunities and nesting opportunities for nēnē.
- Require that future earthmoving projects remove all excess soil from the vicinity of the PMRF airfield to reduce mounds/berms that are utilized by nēnē for nesting.
- Maintain vegetation on a monthly basis at the Oxidation Pond to deter nēnē from nesting.
- Pending Air Ops funding, conduct a feasibility study to identify a barrier or deterrent under Nohili Road to exclude nēnē and Hawaiian waterbirds from utilizing Kinikni ditch to access the airfield. Pending feasibility study results, install a wire grate/ exclusionary device or deterrent at the opening of Kinikini Ditch that runs under Nohili Road to block access of nēnē to the south end of the runway.

All vegetation removal projects will require a nest survey by a qualified biologist prior to commencement of work, and no work shall commence within 100 feet (ft) of an active listed species nest. A biological monitor will be present during vegetation removal work to ensure work is conducted outside of the 100 ft buffer. All BASH-related habitat modification projects will follow protocols outlined in the Nene & Hawaiian Waterbirds Hazing Protocols (Appendix A). Additionally, all other general BASH vegetation maintenance activities are described in the "Vegetation Maintenance" section below.

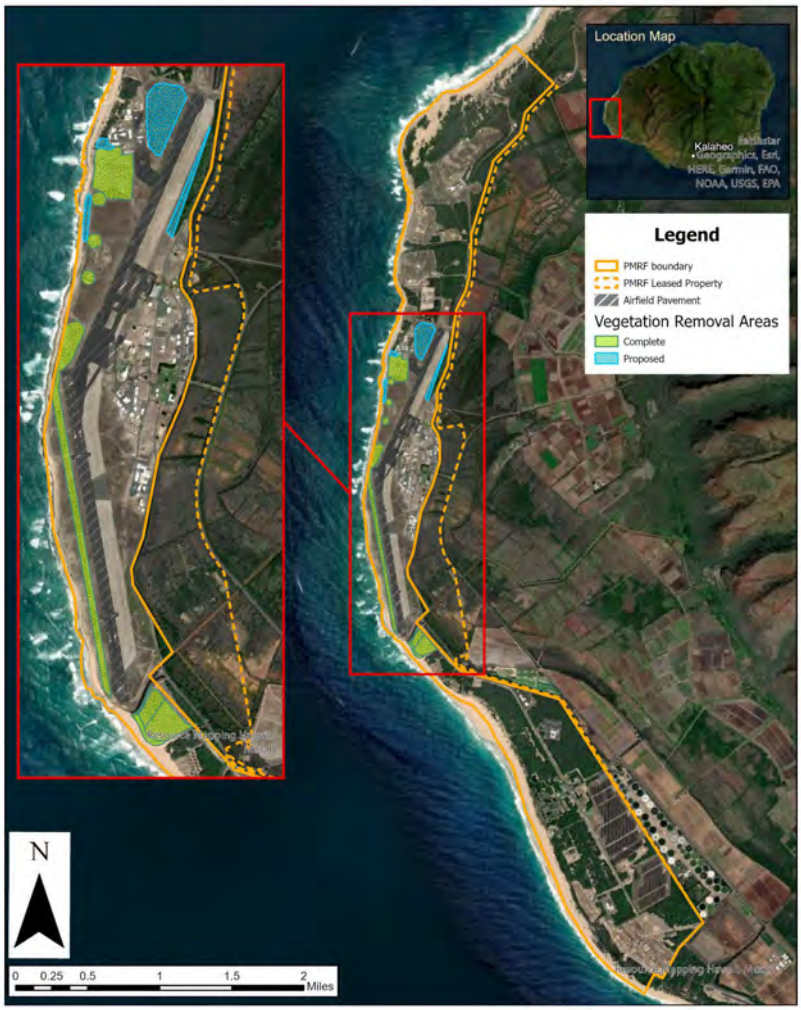

Figure 2. Locations of habitat modification and exclusion projects at PMRF Barking Sands.

BASH Hazing for Hawaiian Waterbirds

Hawaiian waterbirds are commonly observed in Kinikini Ditch at the south end of the runway, and occasionally walk onto the runway creating a BASH risk. Hazing events from 2015-2023 (Figure 3), show that koloa maoli and ae‘o are the primary waterbirds hazed in relation to BASH management. PMRF is proposing hazing of Hawaiian waterbirds when they are observed on the airfield or within 750 ft from the runway and determined to be a direct risk to flight operations. The methods to haze Hawaiian waterbirds are listed in Table 1 and include vehicle harassment, on foot harassment, hand clapping, noise makers, effigies, pyrotechnics, flags, and mylar tape. Hazing of Hawaiian waterbirds will be conducted by U.S. Department of Agriculture Wildlife Services (USDA-WS) and the Wildlife Detection Dispersal Team (WDDT). The WDDT is a group who identify wildlife hazards and safely mitigate them for aviation safety within the airport operating area. They are trained by USDA-WS and may comprise of personnel from Airfield Services, Airfield Management, Aircraft Rescue and Fire Fighting personnel, Air Traffic Control, the Natural Resource Manager and USDA employees. Specific protocols for hazing Hawaiian waterbirds can be found in Appendix A.

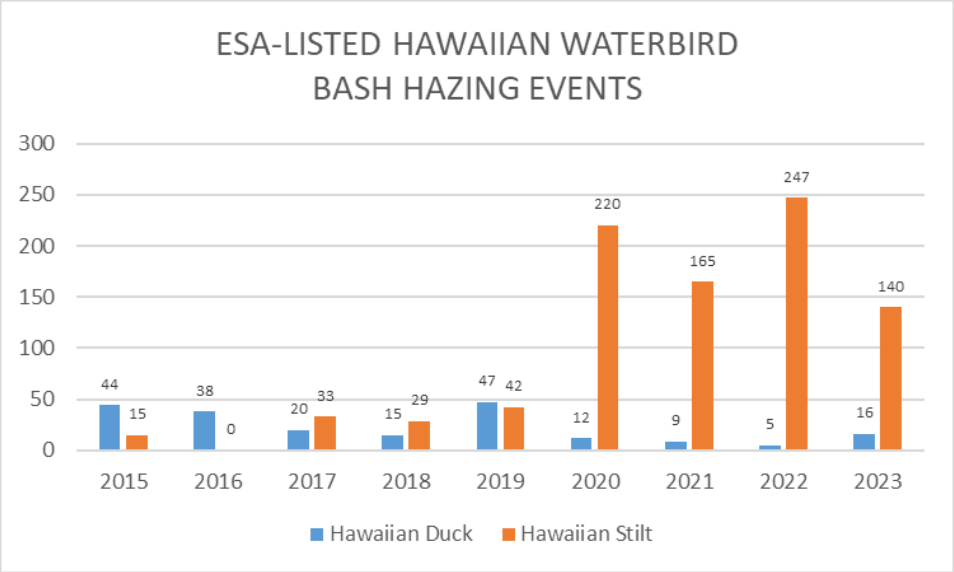

Figure 3. Hawaiian waterbird BASH hazing events from 2015-2023.

BASH Hazing for Nēnē

The nēnē is the primary species that requires hazing at PMRF Barking Sands and poses the largest BASH threat of the listed species there. The BASH program has initiated base-wide hazing of nēnē, as authorized under the nēnē 4(d) rule, and proposes to expand hazing techniques to implement more effective management of nēnē near the airfield and across PMRF Barking Sands. The objective of these harassment techniques is to reduce the presence of nesting nēnē base-wide and address the increasing nēnē populations on PMRF Barking Sands.

BASH-related hazing for the nēnē occurs year-round, with increased efforts prior to and during the nēnē breeding season (September-April). Hazing is conducted by USDA-WS, PMRF Natural Resource (NR) staff, as well as trained Command Duty Officers (CDOs) to provide weekend coverage. PMRF conducts base-wide hazing of nēnē, the majority of which is compliant with the nēnē 4(d) rule, utilizing hazing techniques listed in Table 1. Hazing of brooding adults (e.g., adults with an active nest or gosling) and/or adults in molt is prohibited under the nēnē 4(d) rule. PMRF is proposing to implement hazing of gravid females not actively nesting, families with mobile young, breeding pairs and/or molting adults within 8,000 ft of the airfield (referred to as the nēnē family hazing zone) (Figure 4, Table 1). These hazing techniques will be implemented with the understanding that these individuals are vulnerable and will be hazed with extra care. In the event a nēnē establishes a nest outside the nēnē nest removal zone (NNRZ) (see next subsection for more details), hazing will not be conducted, and the nest will be protected by a 100 ft buffer. Some of the hazing techniques listed in Table 1 may not be realized due to funding constraints or other logistics, however all potential hazing techniques are included. Detailed descriptions and protocols for nēnē hazing techniques can be found in Appendix A.

Table 1. Hazing techniques for nēnē and Hawaiian waterbirds at PMRF Barking Sands.

Hazing Techniques for BASH	Type	Personnel Authorized	ESA-Listed Species Used on	Location
Modified Pistols	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
12-gauge shotgun	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
Bangers/Whistles/Screamers	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
Vehicle Harassment	Active Hazing	USDA-WS	Waterbirds	Airfield/750 ft.
On-foot Harassment	Active Hazing	USDA-WS, WDDT	Waterbirds	Airfield/750 ft.
Sirens/Horns/Clapping	Noise Making	USDA-WS, WDDT	Nēnē & Waterbirds	Airfield/750 ft.
Ultrasonic Repellers	Noise Making	USDA-WS	Nēnē *	Airfield AOA
Propane Cannons	Static Deterrent	USDA-WS	Nēnē *	Airfield AOA
Vehicle harassment	Active Hazing	USDA-WS	Nēnē ***	Airfield/8,000 ft.
On-foot Harassment	Active Hazing	USDA-WS, WDDT	Nēnē *	Airfield/8,000 ft.
Sirens/Horns/Clapping	Noise Making	USDA-WS, WDDT	Nēnē *	Airfield/8,000 ft.
Flags	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Airfield/8,000 ft.
Mylar tape	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Airfield/8,000 ft.
Scarecrow/Effigies/Decoy	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Airfield/8,000 ft.
Inflatable Air Dancers	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Airfield/8,000 ft.
Balloons	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Airfield/8,000 ft.
Hazing with trained dogs	Active Hazing	Trained handler	Nēnē *	Main Base-wide
12-gauge shotgun	Pyrotechnics	USDA-WS	Nēnē **	Main Base-wide
Bangers/Whistles/Screamers	Pyrotechnics	USDA-WS	Nēnē **	Main Base-wide
Recorded Barks	Bioacoustics	USDA-WS	Nēnē **	Main Base-wide
Distressed Calls of Geese	Bioacoustics	USDA-WS	Nēnē **	Main Base-wide
Non-Toxic Repellent	Chemical	USDA-WS	Nēnē **	Main Base-wide
Herding or Harassing w/ Tethered Dogs	Active Hazing	USDA-WS	Nēnē **	Main Base-wide
Herding by Vehicle	Active Hazing	USDA-WS, WDDT	Nēnē **	Main Base-wide
Vehicle Harassment	Active Hazing	USDA-WS, WDDT	Nēnē ***	Main Base-wide
On-Foot Harassment	Active Hazing	USDA-WS, WDDT	Nēnē **	Main Base-wide
Horns/Clapping	Noise Making	USDA-WS, WDDT	Nēnē **	Main Base-wide
Access Control (net/fence)	Exclusion	USDA-WS, WDDT	Nēnē & Waterbirds	Main Base-wide
Geotech Cloth	Static Deterrent	USDA-WS	Nēnē & Waterbirds	Surface waters

*Technique has the potential to incidentally harass Hawaiian Waterbirds

**Base-wide BASH hazing will only be conducted to non-brooding/molting adults with no goslings present

***Vehicle harassment will not be used on nēnē families with mobile young

To note: Hazing to nēnē on the airfield or within the 8,000 ft. buffer zone includes brooding/molting adults

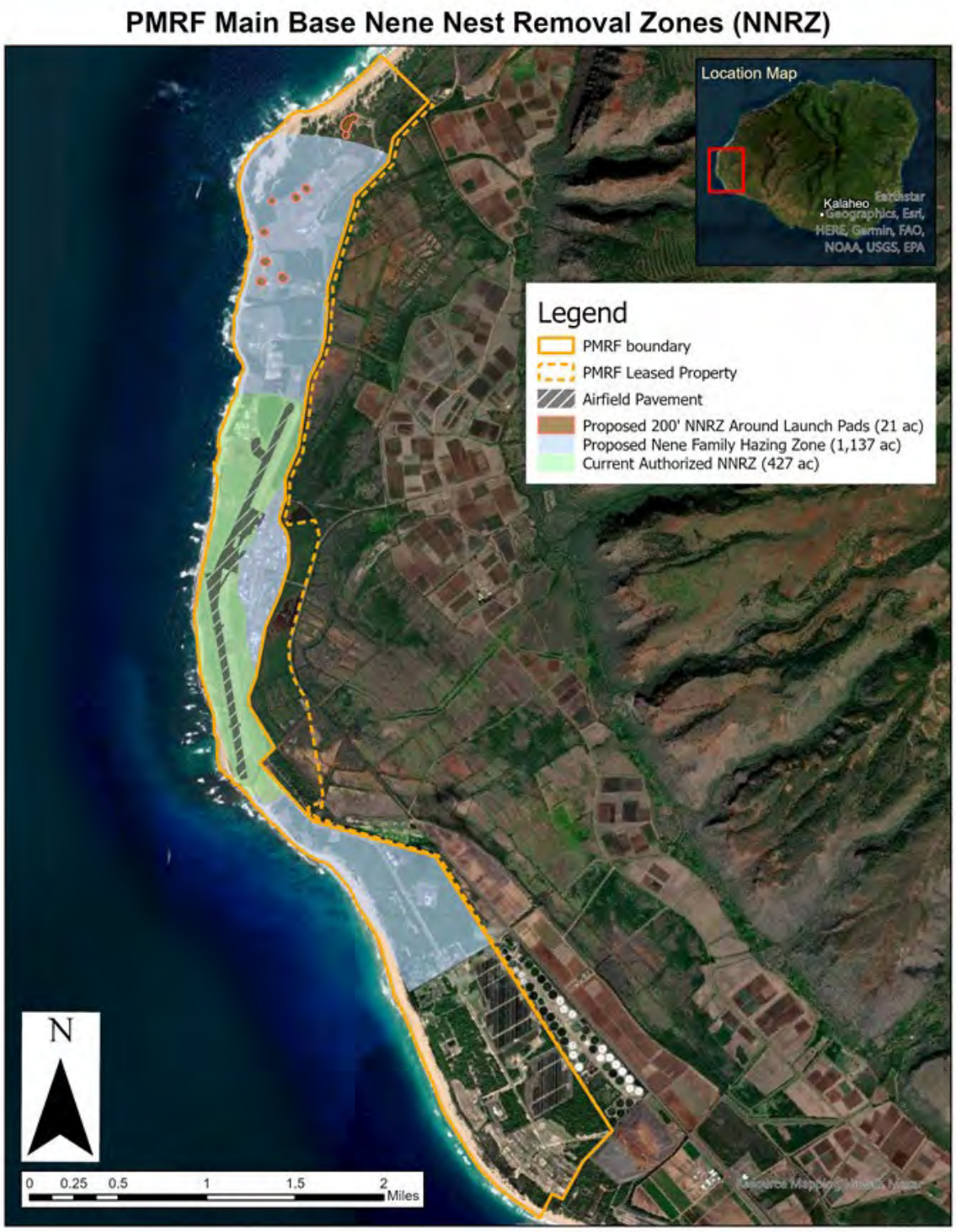

Figure 4. Proposed nēnē nest removal zone (NNRZ) and nēnē family hazing zone (within 8,000 ft of runway).

Nēnē Nest Removal Zone

Despite the implementation of hazing and other BASH management activities, there is still the possibility that nēnē may nest near the runway. Therefore, PMRF has previously coordinated with the Service to establish a nēnē nest removal zone (NNRZ) that extends 750 ft on either side of the runway centerline, 150 ft on either side of the taxiway's centerlines, and 100 ft from the edge of aircraft parking aprons (Figure 4). Within the NNRZ, PMRF is proposing that USDA-WS personnel and the WDDT are authorized to remove nēnē nests. In the event a nēnē establishes a nest inside the proposed NNRZ, PMRF NR will contact the Service within 24 hours. USDA-WS, the WDDT and PMRF NR will meet to discuss the stage of nest development and timing for nest removal, if determined necessary. Nest removal will follow procedures described in Appendix A. As mentioned previously, proactive hazing before nēnē breeding season will be conducted, along with habitat management, to reduce the necessity of these actions. In addition, PMRF Air Ops is proposing to increase the current NNRZ to include a buffer around launch pads, which is discussed in the next section.

Hazing and Nest Removal Near Launch Pads – PMRF Barking Sands

There are four launch areas in the northern third of PMRF Barking Sands that contain multiple launch pads and associated launch facilities (Figure 5). The four launch areas are managed by PMRF, Department of Energy (DOE)/National Nuclear Security Administration (NNSA) and Missile Defense Agency (MDA) and are as follows: North Launch Complex (also referred to as North Launch Area 1), Kaua'i Test Facility, 50K Launch Area (located at North Launch Area 2), and Vertical Launch System (located at North Launch Area 2). A fifth launch site (THAAD launch pad) is in the southern third of base and was used once by the University of Hawai'i, with no plans to use that launch site for launches or live fire activities.

The North Launch Complex encompasses approximately 3 acres, is managed by PMRF, and contains nine launchers, some of which are mobile/temporary. The Kaua'i Test Facility is managed and operated by the DOE/NNSA's Sandia National Laboratory (SNL). This site is approximately 95 acres and contains four launch pads. The 50K Launch Area is managed by PMRF and contains one launch pad, as well as open space for live fire exercises. The 50K launch area encompasses approximately 28 acres and is located along the coastline of PMRF Barking Sands. The Vertical Launch System (VLS) is managed by MDA and encompasses approximately 2.3 acres. The extant THAAD launch pad is managed by MDA and has been decommissioned, with no plans to utilize this launch site. Live fire training events may occur at both PMRF-managed sites; the north launch pad and 50K launch site. Launch and live fire training activities have been previously consulted on with the Service.

Figure 5. Launch Facilities in the Northern portion of PMRF Barking Sands.

The proposed plan is to actively haze nēnē observed within 500 ft from a launch site or live fire activity with a launch or live fire exercise scheduled within 30 days. The hazing would be conducted by USDA-WS, trained PMRF personnel and/or trained PMRF tenants. Proposed hazing techniques are outlined in Table 2 and further described in Appendix A; a designated PMRF Range POC would coordinate with USDA-WS to identify areas and timelines requiring monitoring, and to coordinate scheduling and training of identified support staff. PMRF plans to fund a full-time dog handler and trained dog(s) to assist with hazing around the airfield air operation area (AOA) and launch pads. Alternatively, if a dog handler is not feasible, PMRF plans to fund a trained biologist to cover hazing activities around the airfield AOA and launch sites. Any person that is involved in hazing of nēnē for the military mission is required to be trained by the USDA-WS biologist prior to hazing.

Table 2. Proposed nēnē hazing techniques near launch pads.

Hazing Techniques at Launch Pads	Type	Personnel Authorized	ESA-Listed Species used on	Location
Hazing with trained dogs	Active Hazing	Trained handler	Nēnē	500’ from pads
Herding or Harassing w/ Tethered Dogs	Active Hazing	USDA-WS	Nēnē	500’ from pads
On-foot Harassment	Active Hazing	USDA, trained staff	Nēnē	500’ from pads
Vehicle Harassment	Active Hazing	USDA, trained staff	Nēnē	500’ from pads
Horns/Clapping	Noise Making	USDA, trained staff	Nēnē	500’ from pads

Additionally, PMRF is proposing to include a 200 ft buffer around launch pads/live fire areas (Figure 4). If a nest is found within 200 ft of a launch pad or live fire area with a launch or live fire event scheduled within 30 days, a PMRF biologist, USDA-WS biologist or Navy-approved biologist will coordinate with Range Operations and/or launch tenants to see if the launch can be delayed avoiding nest removal. Nēnē nest removal will only occur if a nest is discovered within 200 ft of a launch site or live fire training area and the exercise is not able to be delayed or relocated and it is determined a safety risk for the mission activity. If it is determined that nest removal is required, the PMRF NRM will be contacted immediately to record the location of the nest, number of eggs, data on the parents, and to contact the Service to coordinate nest removal. If not avoidable, the nest will be removed in accordance with Appendix A. In some scenarios, it may be determined that nest removal is not required and a PMRF NR biologist, USDA-WS biologist or Navy-approved biologist will monitor the nest and nesting adult(s) to document any adverse effects, should they occur, from the launch activity.

Use of Driving Range and Athletic Fields – PMRF Barking Sands

PMRF Barking Sands contains a driving range, baseball field, tennis courts, racquetball courts, basketball courts and a soccer field (with synthetic turf), all within the southern portion of PMRF. There are approximately 150 personnel, including family members, who reside at PMRF and can utilize these facilities. PMRF also allows guests to stay on Barking Sands property and use these facilities as well.

The athletic fields and courts are used regularly by adults and children. The driving range, located further south on base, is seldom used by PMRF residents and guests. The driving range is a self-service venue, where users obtain balls from the Morale, Welfare and Recreation (MWR) office and bring their own clubs to practice. MWR explains to all users that in the event a nēnē is observed on the driving range, all ball striking activities will cease until the nēnē leaves the area due to hazing or on its own accord.

Oxidation Pond Management and Upgrades – PMRF Barking Sands

Within the southern third of PMRF Barking Sands is a sewage oxidation complex. The complex consists of 1 untreated sewage pond, 1 solids/sludge dry bed, and 2 effluent ponds. The untreated sewage pond is a shallow pool designed to treat wastewater through the interaction of sunlight, bacteria and algae. Outbreaks of avian botulism occasionally occur at the Oxidation Pond due to low oxygen and anaerobic conditions. When a bird is found deceased in the Oxidation Pond, it is retrieved whenever possible and tested for botulism if body size and condition are sufficient to allow for testing. This typically precludes testing on all chicks and on Hawaiian stilts unless

multiple carcasses are collected. The Oxidation Pond complex is then thoroughly checked for deceased waterbirds each day for one week to ensure that a botulism outbreak is immediately identified and minimized. All listed birds found deceased on PMRF sites are reported to the Service within 24 hours.

Maintenance and upgrades to the Oxidation Pond are necessary to decrease the likelihood of botulism outbreaks and to ensure proper functioning of the Oxidation Pond. Projects may include flushing of the ponds and dredging of accumulated sludge to reduce the occurrence of anaerobic conditions. One proposed project involving construction activities at the Oxidation Pond is the Oxidation Pond re-lining project. This project will require an authorized biologist to haze Hawaiian waterbirds and nēnē prior to construction commencing to avoid potential nests within the project footprint. Vegetation maintenance will also be conducted on a more frequent basis beginning a year prior to the project to remove attractive nesting habitat. The project may also require ongoing hazing by an authorized biologist to reduce potential collisions with construction equipment. If a nest is discovered within the project footprint, a determination will be made if a buffer will be implemented, and the nest can remain until the chick(s)/gosling(s) have hatched and can safely leave the nest site. If a buffer will not be implemented, work will continue in the area up to the nest site. Re-lining of the Oxidation Pond is anticipated to take 6-8 months to complete. The project will require using an adjacent effluent pond as the main retention pond, while the Oxidation Pond is drained for re-lining. The project will also require removal of vegetation around the pond prior to construction.

<u>Vehicular Driving – all PMRF sites</u>
Due to the long and narrow layout of PMRF Barking Sands, personnel use a 5 mile stretch of roadway, Nohili Road/Sidewinder Road, to traverse from the southern portion of the base to the northern portion. Nohili Road has a speed limit of 35 mph during the day and 25 mph from 6:00pm to 6:00am (excluding from the airfield to the Operations Gate and North of the Japanese Cemetery). In total there are 23.4 miles of roadways on PMRF Barking Sands. Speed limits along all roads, excluding Nohili Road, are 25 mph or less. Tartar Drive is the main road to access PMRF property, which has a speed limit of 15 mph.

There are approximately 150 personnel, including dependents, who live full-time on PMRF Barking Sands. Additionally, there are military personnel, civilian employees and contractors who work at PMRF and drive on PMRF property Monday thru Friday (approximately 700 people). There are also people who come to PMRF Barking Sands to stay at the beach cabins (up to 130 cottage guests) and recreate on property, which may increase vehicles on the road during weekends. In addition to daily commuters, when military events or launch activities occur, there is an influx of personnel, and therefore an increase in vehicles.

Most vehicles on the roads of PMRF are civilian-owned, personal vehicles. There are also contractor-owned vehicles and trucks on property related to the long-term base-wide contract that services the entire base, as well as USDA-WS personnel, and contractors working on specific construction projects. Military vehicles use PMRF Barking Sands during training events, which occur sporadically throughout the year and may involve up to 100 personnel using the

northern portion of PMRF Barking Sands. While most of the vehicular driving occurs at PMRF Barking Sands due to the high use of that area by personnel/civilians, this activity occurs at all PMRF sites.

Vegetation Maintenance – all PMRF Sites

Vegetation maintenance occurs throughout PMRF Barking Sands, Makaha Ridge and Kōkeʻe. Most landscape maintenance activities are performed under a base-wide contract. The grounds at PMRF Barking Sands, Makaha and Kōkeʻe are categorized by five maintenance levels: Prestige, improved, semi-improved, unimproved and BASH. Work performed under the base-wide contract includes grounds maintenance, lawn care, edging, applying herbicide, irrigation operation/maintenance, shrub and hedge maintenance, debris removal, and tree maintenance. These services are provided routinely, on a cyclical basis, or as an on-call service, depending on the maintenance level and need.

Prestige grounds at Barking Sands encompasses approximately 3.8 acres and includes areas such as the manicured grass surrounding the pass and ID house. Many of the commonly used buildings and facilities on Barking Sands (e.g., base administration buildings, driving range, and Shenanigans restaurant) are surrounded by "improved grounds", which total approximately 12.4 acres. Maintenance equipment generally used for prestige and improved grounds includes hand-pushed mowers, ride-on mowers, loppers, gas-powered hedge trimmers, and weed whackers. Prestige maintenance includes weekly or bi-weekly mowing, removal of grass shavings, irrigation, weeding and applying herbicide if necessary, and manicuring hedges. Improved grounds are maintained on a bi-weekly to monthly basis, which depends on wet season versus dry season.

Semi-improved grounds include most grassy areas adjacent to buildings, parking lots and facilities on Barking Sands and account for approximately 60.8 acres. Semi- improved grounds maintenance generally uses ride on mowers and weed whackers. In areas where the terrain is uneven, a ride-on tractor with blade attachment is used. The maintenance schedule for semi-improved grounds is monthly. The contractor is required to only use herbicides on a DoD approved herbicide list and must record all herbicide applications monthly. Herbicides are generally used only around pavements and fencing.

Unimproved grounds make up most of the acreage on Barking Sands, totaling approximately 403 acres. These areas are generally composed of kiawe and koa haole, with an invasive grass understory. Other areas of unimproved grounds include roads along Makaha and Kokeʻe. Tree trimming may occur on unimproved grounds to maintain fire breaks or to avoid branches from falling or touching utility lines. Maintenance of unimproved grounds includes ride-on mowers, ride-on tractors with a blade attachment, and use of chainsaws to cut branches or trees that pose a safety risk. Occasionally, herbicides are used to keep invasive grasses from encroaching onto semi- improved grounds. Grounds maintenance generally occurs monthly.

BASH maintenance areas include the open land surrounding the runway in all directions. The total acreage for BASH managed vegetation maintenance is approximately 239 acres. Personnel

most commonly use weed eaters and tractors with a pull behind cutter blade to maintain vegetation and grasses. Maintenance equipment may also include ride-on mowers for level areas, and use of a chainsaw or loppers to cut larger vegetation bushes that have established along the shoreline. Grass heights are maintained between 7-14" in BASH managed areas.

The base-wide contractor is also responsible for tree trimming activities when they are determined necessary. There are circumstances where tree trimming, or removal is determined necessary due to human health and safety and must be conducted during the bat pupping season of June 1st to September 15th. Past examples of tree trimming/removal due to emergency situations include: an unhealthy branch hanging over the entrance of the childcare center, a water main leak that required tree removal to access the break, and a tree branch touching an electrical line. Any emergency tree trimming activities occurring during the bat pupping season will follow protocols in the PMRF Roost Detection Protocol for Hawaiian hoary bats (Appendix B). Tree maintenance generally involves chainsaws and a cherry picker or ladder to access the branches for pruning. Tree trimming activities could occur at all PMRF sites.

There is also the 181-acre Kaua‘i Island Utility Cooperative (KIUC) PV solar array and associated buildings in the southern portion of base. This area is leased to KIUC and maintained by a sub-lessee/subcontractor, AES. Vegetation in this area is generally maintained three times per year and PMRF NR is working to standardize this schedule to September, January and May, which would reduce potential nesting habitat prior to the nēnē breeding season. AES is also exploring the potential to replace large-scale mechanical mowing and herbicide application with using sheep to graze, which has been successful at other PV sites. Sheep would be managed by a Kaua‘i rancher and would be kept inside solar powered electric fence paddocks, which would be rotated throughout the 181-acre parcel. Sheep are not able to graze around electrical equipment at the PV site, therefore mechanical removal and herbicides would still be used on a smaller scale at this site.

Construction Activities – PMRF Barking Sands, Makaha and Kamokala Ridge

The types of proposed construction activities include repair, maintenance and upgrade projects to existing structures, buildings, grounds, utilities, and airfields; installation of perimeter fencing without barbed wire; replacement or reconstruction of existing structures or facilities where the new structure will be located in the same site with the same purpose; interior upgrades/repairs; as well as replacement and consolidation of buildings/facilities.

Table 3 includes a list of potential future construction projects scheduled for FY24-34 that may occur at Barking Sands or other PMRF sites on Kaua‘i. However, the Navy noted that the project execution year for projects could be pushed back, and projects may not be realized due to funding restraints and changing command priorities.

Table 3. Proposed Future Construction Activities at PMRF sites from FY24-34.

FY24-26 PMRF Proposed Future Project List	Timing	Approx. Footprint	Location
Replace communication hand holes lids to service existing telcom lines	1-2 months	3,000 sq. ft. or less	Barking Sands

Add a roof/shelter to the existing airfield navigational aid generator	1-2 months	3,000 sq. ft. or less	Barking Sands
Repair roof, siding, and gutters on B413	1-2 months	3,000 sq. ft. or less	Barking Sands
Install an electric meter to service select existing facilities	2-4 months	3,000 sq. ft. or less	Barking Sands
Add smart data systems to the current water and wastewater utilities to make them more energy efficient	2-4 months	3,000 sq. ft. or less	Barking Sands
Upgrade existing electrical and HVAC systems to smart grid controls	2-4 months	3,000 sq. ft. or less	Barking Sands
Install speed calming measures with signage on Nohili Road at Aegis Ashore, HIANG corner, Kinikini Ditch, and/or Nohili Ditch	2-4 months	3,000 sq. ft. or less	Barking Sands
Repair/replace wells, pumps, and outlet pipe at Mana Well, near Kamokala Ridge	4-6 months	3,000 sq. ft. or less	Kamokala Ridge
Repair and renovate Shenanigans Restaurant	4-6 months	3,000 sq. ft. or less	Barking Sands
Installation of fire protection flooring at hangar including exterior tank	6-8 months	3,000 sq. ft. or less	Barking Sands
FY27-34 PMRF Proposed Future Project List	**Timing**	**Approx. Footprint**	**Location**
Repair walls and roof on Hangar	2-4 months	3,000 sq. ft. or less	Barking Sands
Install wire grate under Nohili bridge to exclude nene from Kinikini Ditch	4-6 months	3,000 sq. ft. or less	Barking Sands
Upgrade/increase the capacity of the existing water system	4-6 months	10,000 sq. ft. or less	Barking Sands
Replace the current guard shack at the entrance and install a covered area for vehicle inspections	6-8 months	3,000 sq. ft. or less	Makaha Ridge
Rockfall Mitigation at Kamokala Caves site	8-10 months	10,000 sq. ft. or less	Kamokala Ridge
Consolidate a KIUC existing electrical feeder under on electrical grid	8-12 months	10,000 sq. ft. or less	Barking Sands

All construction contractors and sub-contractors for the projects above will be required to follow protocols developed by the PMRF NR office. All construction personnel must keep a 100 ft distance from any listed species observed on or near the construction site and will allow the species to leave on its own accord. For construction sites using heavy equipment with known listed species on or near the construction site, a qualified biologist is required to perform monitoring during the activities to ensure species are not affected by activities. If a nest is discovered, the project manager shall notify the PMRF NR office, and all work shall cease around the nest. A PMRF biologist will identify the nest, collect information on the nest and erect a 100 ft buffer fence around the nest to avoid further disturbance. For construction projects that do not fall into the proposed types of construction activities as described above (e.g., repair, maintenance, upgrade, replacement of existing structures or facilities, etc.), the Navy will consult with the Service separately as necessary. For construction projects not requiring separate

consultations, the general construction protocols above and outlined in Appendix A will be applied.

Hazing for Bird Protection and Safety – all PMRF sites

PMRF proposes to initiate hazing of nēnē and Hawaiian waterbirds for their protection at all six PMRF sites with emphasis on PMRF Barking Sands (2,060 acres) and Makaha Ridge (209 acres) in areas determined to be high risk for nēnē and Hawaiian waterbirds (along roadways, and in situations of imminent danger). Proposed hazing for nēnē and Hawaiian waterbird protection at the Kōkeʻe sites (19 acres), Kamokala Ridge Magazines (29 acres), Port Allen (120 acres), and Miloliʻi Ridge (.0138 acres) will be less frequent but may increase in the event populations increase. Hazing activities for bird protection are listed in Table 4 and include on-foot harassment, horns/clapping, inflatable air dancers, access control, and static deterrents. These hazing activities will be primarily executed by PMRF NR staff, including PCSU staff. Additional PMRF personnel and contractors may be trained and authorized to conduct hazing if deemed necessary.

It may be necessary to haze brooding adults, molting adults and/or goslings during the nēnē and/or Hawaiian waterbirds breeding seasons if they are found along roadways or near activities that may cause injury or mortality (e.g. vehicle collision, botulism event, missile launch, construction equipment operation, vegetation maintenance activities). The hazing techniques include intentional harassment of gravid females not actively nesting, families with mobile young, breeding pairs and/or molting adults with the understanding that these individuals are vulnerable and will be hazed with extra care. Hazing will be done with the upmost care to ensure no injury or mortality. USDA-WS personnel, WDDT personnel, trained PMRF NR personnel and trained PMRF staff would be authorized to haze brooding adults, molting adults, and/or goslings in situations that ensure the safety of nēnē or Hawaiian waterbirds.

Table 4. Proposed hazing techniques for nēnē and Hawaiian waterbird for protection and safety from high-risk activities.

Hazing Technique	Type	Personnel Authorized	Listed Species Used On	Location
On-foot Harassment	Active Hazing	NR, trained staff	Nēnē & Hawaiian waterbirds	All PMRF Sites
Horns/Clapping	Noise Making	NR, trained staff	Nēnē & Hawaiian waterbirds	All PMRF Sites
Inflatable Air Dancers	Static Deterrent	NR, trained staff	Nēnē & Hawaiian waterbirds	All PMRF Sites
Access Control (net/fence)	Exclusion	NR, trained staff	Nēnē & Hawaiian waterbirds	All PMRF Sites

Development of a Hunting Program – PMRF Barking Sands, Makaha and Kamokala Ridge

The Navy developed PMRF Hunting Instruction 1710.2A in June 2019 to establish a hunting program at PMRF sites. The hunting program includes three PMRF sites: Barking Sands,

Makaha Ridge, and Kamokala caves. Hunting is limited to feral hogs, feral goats, and black tailed deer. Hunters are only authorized to use bow and arrow (e.g., compound, recurve, and crossbows); dogs and firearms are prohibited.

Hunting on PMRF sites will only be authorized on days designated by the Commanding Officer, typically Saturday or Sunday, from one half hour before sunrise to one half hour after sunset. Hunting areas that include known listed species attractants (e.g. the Oxidation Pond) will be closed during Hawaiian waterbird and nēnē breeding seasons or when increased activity of Hawaiian waterbirds and/or nēnē are observed. The PMRF hunting program requires all personnel involved in hunting to obtain a State of Hawaiʻi hunting license, become a member of the Barking Sands Archery Club (BSAC) and have an authorization to transport archery equipment on base. Hunters are required to attend an annual PMRF Hunting Rules, Regulations, and Safety brief, which includes protocols to identify, avoid and protect listed species. Hunters must check-in and check-out, carry a hunting pass on their vehicle and wear blaze orange to ensure safety. The PMRF hunting program allows the following number of personnel for each site: 10 hunters and one assistant per hunter for a maximum of 20 personnel on Barking Sands; six hunters and one assistant per hunter for a total of 12 personnel at Kamokala caves; and eight hunters and one assistant per hunter for a total of 16 personnel at Makaha Ridge.

The Game Warden is responsible for ensuring that hunting is conducted in accordance with base environmental policy to achieve wildlife and habitat management objectives. The Game Warden is also responsible for communicating and coordinating with PMRF NR staff to avoid and minimize impacts to listed species, such as using closed seasons and off-limits areas where increased activity of listed species are observed.

<u>Predator Control Program – PMRF Barking Sands, Makaha Ridge, and Kōkeʻe</u>
The Navy has a Cooperative Agreement with the University of Hawaiʻi (UH) through the Research Corporation for UH (RCUH) and the Pacific Cooperative Studies Unit (PCSU) to provide predator control activities at the installation for the protection of native species. There are currently two full-time field biologists that specialize in the trapping, removal, and euthanasia of invasive vertebrate species. These staff are authorized to remove feral cats, rodents, dogs, pigs, and barn owls from the landscape through a variety of lethal and non-lethal techniques. Most of the trapping effort occurs at Barking Sands due to the higher likelihood of predator-prey interactions compared to other sites. Less frequently, trapping occurs at Makaha Ridge and Kōkeʻe due to lower densities of predators and limited breeding of listed birds at these sites. Predator control focuses on removing feral cats and rodents from the landscape because the high abundance and densities of these species poses the highest risk to protected avian species.

Cage traps (live traps) are used to remove feral cats. Captured cats are either euthanized or transported to Kauaʻi Humane Society. Live traps are required to be checked daily and in practice are checked as early as possible each day to minimize an animal's time in the trap. During a typical trap night, up to 30 cage traps are open across Barking Sands, Makaha Ridge and the Kōkeʻe Sites. Trap locations and distribution are chosen to protect native species most effectively, considering season and potential food sources for cats. In the program's current

form, four nights for trapping every standard work week contributes to the removal of over 100 cats from PMRF annually. GoodNature A24 traps are lethal, self-resetting traps that provide landscape level rodent control. A24 trap grids are deployed in known breeding areas of listed species to reduce rodent populations and minimize egg depredations. A24s are deployed at Kōkeʻe and Barking Sands.

Several measures are taken to minimize interactions between predator control methods and listed species. These measures include maintaining a trap-free buffer area around high-use areas for protected species, using lures instead of bait in traps near high-use areas, deploying gosling guards on the fronts of traps, and using strategically placed vegetation to deter curious birds. Furthermore, all traps are out of view of the public and have either full or partial shade provided by vegetation and/or a trap cover (roof shingle) to protect trapped animals from exposure to sun and rain. A24 traps are additionally deployed with the downward-facing opening close (4-5") to the ground and with wire guards in place if there is any possibility that a protected species may interact with the trap.

Dog control occurs infrequently and only in response to dog sightings. PSCU staff only use live traps to capture loose dogs, and all dogs are transported to the Kauaʻi Humane Society. Feral pig and barn owl control is not currently being operated by PCSU staff at PMRF.

Barbed Wire Fencing – all PMRF sites

All six PMRF sites currently have a total of 8.2 miles (mi) of 3-strand barbed wire fencing. Additionally, Barking Sands has 0.7 miles of 6-strand barbed wire. Barbed wire fencing at PMRF sites is for security purposes and are installed in a wide range of areas throughout installation sites.

Conservation Measures

The following conservation measures will be implemented to avoid or minimize impacts to listed species and are considered part of the project description. These include conservation measures that were implemented at PMRF prior to reinitiation of this consultation. Conservation measures are tied to specific actions as described above. If an action does not occur, the associated conservation measure will not be implemented.

Hawaiian Goose or Nēnē

BASH Management Activities:

- Hazing efforts will be increased prior to the nēnē breeding season to avoid nesting within the proposed NNRZ. Hazing efforts will be conducted by USDA-WS personnel, the WDDT and if requested, the PMRF NR staff. The objective is to reduce successful nesting attempts within the NNRZ to reduce nest removal, with a goal of 100% coverage within the NNRZ during daylight hours.
- PMRF Air Ops, in coordination with the base-wide landscape contractor, will monitor and maintain grasses to 7-14" in areas managed for BASH, specifically within the proposed NNRZ, to reduce suitable nesting habitat, thereby minimizing nest removal.

- PMRF will flatten and remove berms near the runway, which attract nēnē (applies only to berms that attract nēnē).
- PMRF Commanding Officer will authorize weekend support for BASH hazing to reduce nēnē nesting attempts within the proposed NNRZ.
- PMRF has obtained a trained hazing dog in compliance with nēnē 4(d) rule requirements and will utilize the hazing dog to haze nēnē more effectively within the proposed NNRZs and base wide, which will reduce the need for nest removal.
- Future buildings/facilities will utilize xeriscaping, artificial turf, native plant species, gravel, or other unattractive landscaping to reduce foraging and nesting opportunities within the NNRZ for nēnē. This will reduce physical disturbance to nēnē and potential nest removal if found within the NNRZ.

Hazing and Nest Removal Near Launch Pads:

- PMRF Commanding Officer will authorize weekend support of hazing near launch pads to reduce nēnē nesting attempts; nēnē will be hazed if observed within 500 ft of a launch site or live fire activity site with a launch or live fire scheduled within 30 days.
- If a nest is found within 200 ft of a launch pad or live fire area with a launch or live fire event scheduled within 30 days, a PMRF biologist, USDA-WS biologist or Navy-approved biologist will coordinate with Range Operations and/or launch tenants to see if the launch can be delayed avoiding nest removal.
- PMRF will use a trained or tethered hazing dog to haze nēnē more effectively within 500 ft of a launch pad, which will reduce the need for nest removal. Alternatively, if a dog handler is not feasible, PMRF will fund a trained biologist to cover hazing activities around the airfield AOA and launch sites.
- Low-lying and grassy vegetation around launch pads will be maintained at a height of 7-14” to reduce suitable nesting habitat for nēnē, reducing the need for nest removal.

Use of Driving Range and Athletic Fields

- Install signage at the athletic field complex and driving range explaining protocols and providing the PMRF NR Hotline number so that authorized and trained biologists can assist with hazing, and/or install nest protection in the event of a nest.
- MWR explains to all users that in the event a nēnē is observed on the driving range, all ball striking and activities that may harm the nēnē will cease until the nēnē leaves the area due to hazing or on its own accord. The driving range user is responsible for abiding by the protocols to stop using the driving range until nēnē have left on their own accord or until trained personnel can safely haze them from the driving range.

Oxidation Pond Management and Upgrades

- Hazing will be conducted by trained and authorized individuals that follow hazing techniques outlined in Table 4, to minimize physical disturbance and stress to nēnē.
- Deterrents to exclude wildlife from the pond will be designed to avoid physical disturbance due to entanglement with exclusionary netting.
- Vegetation will be maintained with grasses below 6” and shrubs below 12” to discourage nesting and foraging which will reduce exposure to sporadic avian botulism events.

Vehicular Driving

- Installation of traffic calming measures (e.g. expanded rumble strips, flexible delineator columns, speed cameras, traffic safety painting/markings, etc.) at high-risk locations for nēnē such as HIANG, Aegis Ashore, Kinikini Ditch, and/or Nohili ditch.
- Installation of four listed-bird awareness signs to warn drivers that they must slow down and that "speeding kills nēnē".
- Procurement and use of a moveable LED marquis sign to alert drivers of the potential of nēnē and/or Hawaiian waterbirds in a specific area.
- Utilize public relation outlets (PMRF Facebook page, PMRF MWR page, bulletin boards around Barking Sands, etc.) to provide facts and information on nēnē, and to reinforce the importance of driving slowly and paying attention.
- Test the efficacy of predator effigies and recordings of dog barking near high strike areas on Nohili Road to deter nēnē along roadsides.
- Reduce speed to 25 mph in south end of PMRF Main Base, from Nohili Road at Club Drive (Shenanigans) to end of Nohili Road, to proactively reduce risk in area of base where nēnē are shifting use.
- During events requiring a large increase in visiting personnel, PMRF will implement nēnē awareness and speed reduction measures to include:
    - Reemphasize & highlight nēnē safety in "Orientation Brief" at Shore Support
    - Increase temporary signage in areas with high nēnē use, and risk areas as applicable for the event.
    - Use digital vehicle speed display south of Aegis Ashore
    - Increase speed enforcement capacity during high use events.
    - Increase operating hours at the centrally located Operations Gate to reduce vehicles in the central part of the base, dependent on size and duration of event.

<u>Completed</u> conservation measures for "Vehicular Driving" that have occurred prior to reinitiation of consultation include:

- Place moveable nēnē caution signs (sandwich board) along Nohili Road and at the main entrance to reduce direct strike and physical disturbance to nēnē; at least one sign is left in place at each location throughout the breeding season. (Continuing)
- Install signage near beach cottages and near dining locations that feeding of nēnē is prohibited on base. (Continuing)
- Install crushed coral, then subsequently pave with asphaltic concrete, along Nohili Road (from the Navy exchange to Kinikini Ditch) to reduce foraging opportunities for nēnē along roadside. This increased the buffer distance from foraging areas to the roadway; only three nēnē have been struck in this area in the two years since completion, compared to nine in the two years prior to the project. (Maintained)
- Install rumble strips along Nohili road to slow drivers. (Completed)
- Reduce the speed limit on Nohili Road from 45 mph to 35 mph. (Continuing)
- Reduce speed on Nohili road during nighttime hours (6pm to 6am) from 35 mph to 25mph. Nohili road speed limit remains 35 mph at night from the airfield to the Operations Gate and North of the Japanese Cemetery. (Continuing)

- Increase enforcement of speed limits by base security personnel. (Continuing)
- Open operations gate entrance at Imiloa Road (central portion of base) during high traffic times to reduce cars using high risk sections of Nohili Road. Operations gate will remain closed on weekends and holidays. (Continuing)
- Increase resident and visitor awareness of nēnē, their protected status and the importance of not feeding nēnē. (Continuing)

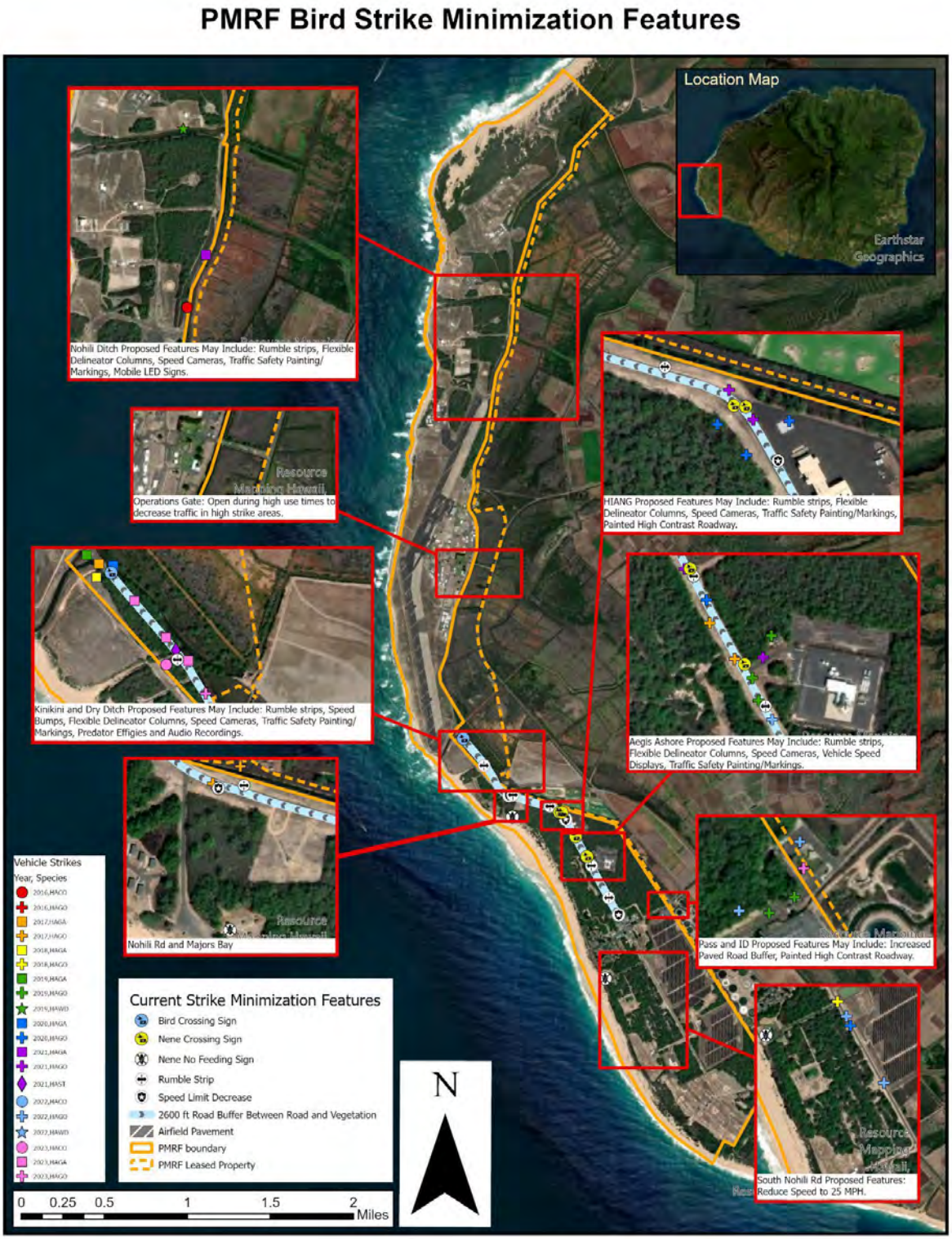

Figure 6. PMRF Barking Sands vehicle strike minimization features.

Vegetation Maintenance/Construction Activities/Oxidation Pond Re-lining Project

- Conduct nest surveys prior to vegetation maintenance and/or construction activities for any areas with vegetation higher than 17" and for areas with known nesting activity (e.g. Oxidation Pond, KIUC PV array).
- The Navy, tenants and contractors will implement the Nēnē and Hawaiian Waterbird Hazing Protocols (Appendix A) and include it in contracted work to ensure the protection of nēnē and their nests to minimize physical disturbance and potential nest abandonment.
- Public Works Office will include all required measures, as outlined in the Nēnē and Hawaiian Waterbird Hazing Protocols in SOWs and contracting documents.
- Prohibit vegetation maintenance and/or construction activities within 100 ft of an active nēnē nest to avoid physical disturbance that may lead to nest abandonment. Note: this measure may not apply to the Oxidation Pond re-lining project. Refer to "Oxidation Pond Management and Upgrades" section above for details.
- Haze nēnē at the Oxidation Pond, and other construction sites, prior to construction activities to avoid nesting in a construction site.
- Conduct vegetation removal at the Oxidation Pond beginning a year prior to the Oxidation Pond construction projects to discourage nēnē from nesting within the project footprint.
- Use the shortest route(s) possible from entrance points to construction sites to reduce vehicles on roadways at Barking Sands. When deemed necessary, require contractors to provide traffic control personnel to manage increased vehicular traffic.
- Future buildings/facilities will maintain vegetation to reduce attractive nesting habitat.

Hazing for Bird Protection and Safety

- Implement non-lethal hazing prior to the breeding season to minimize the presence of nēnē in areas that may cause them injury (e.g. vehicle collision, botulism event, missile launch), to minimize the need to haze breeding adults, molting adults or goslings in these areas. All hazing will be conducted by trained and authorized individuals that follow hazing techniques outlined in Table 4, to minimize physical disturbance and stress to nēnē.

PMRF Hunting Program

- Hunting areas that include known listed species attractants (e.g. Oxidation Pond) will be closed during Hawaiian waterbird and nēnē breeding seasons or when increased activity of Hawaiian waterbirds and/or nēnē are observed.
- Hunters are required to attend an annual PMRF Hunting Rules, Regulations, and Safety brief, which includes protocols to identify, avoid and protect listed species.

<u>Hawaiian Waterbirds</u>

Oxidation Pond Management and Upgrades

- Hazing will be conducted by trained and authorized individuals that follow hazing techniques outlined in Table 4, to minimize physical disturbance and stress to Hawaiian waterbirds.
- Potential deterrents to exclude wildlife from the pond will be designed to avoid physical disturbance due to entanglement.
- Conduct studies at the Oxidation Pond to look at ways of reducing anaerobic conditions, which contribute to botulism outbreaks.

Vehicular Driving

- Installation of traffic calming measures (e.g. expanded rumble strips, flexible delineator columns, speed cameras, traffic safety painting/markings, etc.) at two high risk locations for Hawaiian waterbirds – near Kinikini Ditch and/or Nohili ditch.
- Install two speed bumps between Kinikini Ditch and Dry Ditch to reduce speeding.
- Installation of signage to warn drivers that they must slow down.
- Procurement and use of a moveable LED marquis sign to alert drivers of the potential of Hawaiian waterbirds in a specific area.
- Utilize public relation outlets (PMRF Facebook page, PMRF MWR page, bulletin boards around Barking Sands, etc.) to provide facts and information on Hawaiian waterbirds, and to reinforce the importance of driving slowly and paying attention.

<u>Completed</u> conservation measures for "Vehicular Driving" that have occurred prior to reinitiation of consultation include:

- Install rumble strips along Nohili road to slow drivers. (Completed)
- Reduce the speed limit on Nohili Road from 45 mph to 35 mph. (Continuing)
- Reduce speed on Nohili road during nighttime hours (6pm to 6am) from 35 mph to 25mph. (Continuing)
- Increase enforcement of speed limits by base security personnel. (Continuing)
- Open operations gate entrance at Imiloa Road (central portion of base) during high traffic times to reduce cars utilizing high risk sections of Nohili Road. Operations gate will remain closed on weekends and holidays. (Continuing)
- Increase resident and visitor awareness of Hawaiian waterbirds and their protected status. (Continuing)

Vegetation Maintenance/Construction Activities/Oxidation Pond Re-lining Project

- Conduct nest surveys prior to vegetation maintenance and/or construction activities for any areas with vegetation higher than 17" and for areas with known nesting activity (e.g. Oxidation Pond).
- Develop and enforce the Nēnē and Hawaiian Waterbird Hazing Protocols (Appendix A) to ensure the protection of Hawaiian waterbirds and their nests to minimize physical disturbance and potential nest abandonment.
- Prohibit vegetation maintenance and/or construction activities within 100 ft. of an active Hawaiian waterbird nest to avoid physical disturbance that may lead to nest

abandonment. Note: this measure may not apply to the Oxidation Pond re-lining project. Refer to "Oxidation Pond Management and Upgrades" section above for details.

- Haze Hawaiian waterbirds at the Oxidation Pond prior to construction activities to avoid nesting in a construction site.
- Conduct vegetation removal at the Oxidation Pond beginning a year prior to the Oxidation Pond construction projects to reduce suitable nesting habitat within the project footprint.
- Use the shortest route possible from entrance points to construction sites to reduce vehicles on roadways at Barking Sands. When deemed necessary, require contractors to provide traffic control personnel to manage increased vehicular traffic.

Hazing for Bird Protection and Safety

- Hazing will be conducted by trained and authorized individuals that follow hazing techniques outlined in Table 4, to minimize physical disturbance and stress to Hawaiian waterbirds.

PMRF Hunting Program

- Hunting areas that include known listed species attractants (e.g. Oxidation Pond) will be closed during Hawaiian waterbird and nēnē breeding seasons or when increased activity of Hawaiian waterbirds and/or nēnē are observed.
- Hunters are required to attend an annual PMRF Hunting Rules, Regulations, and Safety brief, which includes protocols to identify, avoid and protect listed species.

Predator Control Program

- Trap-free buffer area is maintained around high-use areas for listed species.
- Using lures instead of bait in traps near high-use areas.
- Deploying gosling guards on the front of traps when necessary and using strategically placed vegetation to deter curious birds.
- Live traps are checked daily and as early as possible each day to minimize an animal's trap time in the trap.
- Live traps have either full or partial shade provided by vegetation and/or a trap cover (roof shingle) to protect trapped animals from exposure to sun and rain.

<u>Hawaiian Hoary Bat or ʻŌpeʻapeʻa</u>

Vegetation Maintenance

- Tree trimming and/or removal will primarily be conducted outside of the bat pupping season (June 1st - September 15th) to avoid physical disturbance to bats. An annual notice of this requirement is signed by the Commanding Officer and released to base personnel and residents.
- Emergency tree trimming that takes place during the bat pupping season will follow thermal imaging surveys outlined in the PMRF Roost Detection Protocol for Hawaiian hoary bats (Appendix B).

- Emergency tree trimming during the bat pupping season will keep 100 ft buffer from any known roost, as described in Appendix B.
- Conduct follow up acoustic surveys for Hawaiian bats every 5 years.

Barbed Wire Fencing

- Continue twice weekly visual surveys of road-accessible sections of barbed wire fence lines (74% of barbed wire fencing) in conjunction with nēnē and Hawaiian waterbird surveys. Surveys require visually (naked eye or binocular) scanning barbed wire for animals or snagged material and investigating any observations.
- Conduct visual surveys along 100% of fence line twice monthly during September, October, and November to coincide with bat fledging season.

Action Area

The action area is defined at (50 CFR 402.02) as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action. The Service has determined that the action area for this project includes the main base of PMRF at Barking Sands; and the following PMRF support facilities/sites on Kaua‘i: Makaha Ridge, Kōke‘e, Kamokala Ridge, Port Allen, and Miloli‘i Ridge.

Details of the sites which encompass the action area are provided below based on descriptions found in the Navy's biological assessment and current condition sections of the draft 2024 PMRF Integrated Natural Resource Management Plan (INRMP). Additional details including maps and pictures of each PMRF site are provided in the draft 2024 PMRF INRMP.

PMRF Barking Sands is located along the Mana Plain on the west side of Kaua‘i near the town of Kekaha. Barking Sands is long and narrow (approximately 7 miles long and 0.5 mile wide), encompassing approximately 2,060 acres. Figure 7 displays a map of Barking Sands with significant facilities/features labeled along with adjacent land use.

Makaha Ridge is located 7 miles north of Barking Sands at approximately 1,400 to 1,850 ft elevation on a high ridge top of the central mountain range of Kaua‘i. This site encompasses approximately 209 acres of land and utilized as a secondary range. The PMRF Kōke‘e sites are located within Kōke‘e State Park east of Makaha Ridge at 3,500 ft in elevation. Kōke‘e sites encompass approximately 19 acres and are composed of tracking radars, telemetry, communications, and command and control. Kamokala Ridge (29 acres) is located approximately 1.5 miles east of Barking Sands and is used primarily for munitions storage. Port Allen is located on the southwestern shore of Kaua‘i adjacent to Hanapepe Bay in the small town of ‘Ele‘ele. The Navy uses this pier primarily for weapons recovery and supporting operation of Navy Seaborne Powered Targets boats. The last site, Miloli‘i Ridge, is the smallest site (0.0138 acres) and encompasses posts supporting three passive 200 ft^2 reflectors.

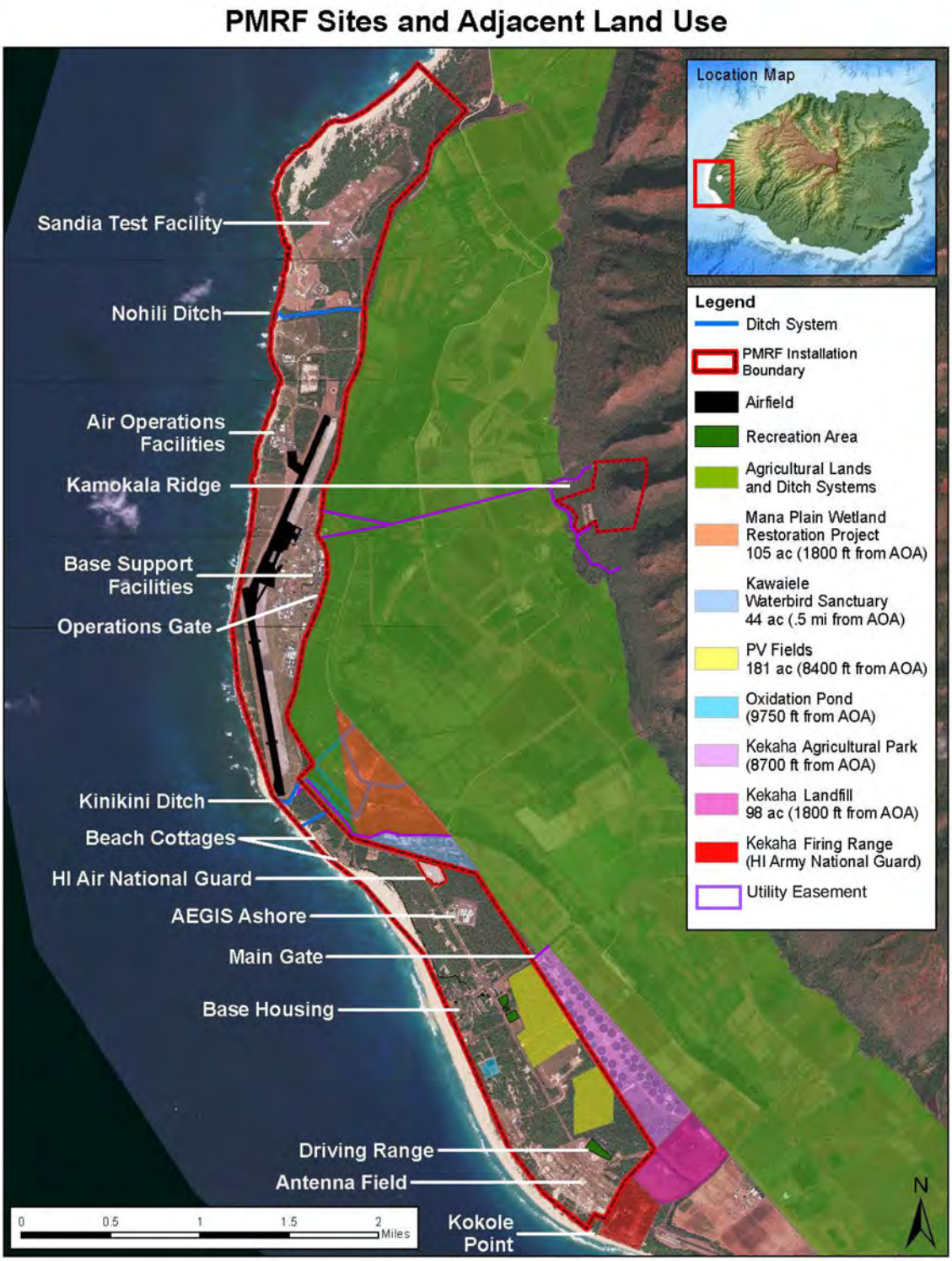

Figure 7. Location and map of PMRF Barking Sands and adjacent land use.

Analytical Framework for the Jeopardy/Adverse Modification Analysis

Jeopardy Analysis Framework

In accordance with regulation (see 84 FR 44976), the jeopardy determination in this Biological Opinion relies on the following four components:

1. The *Status of the Species*, which evaluates the species' current range-wide condition relative to its reproduction, numbers, and distribution; the factors responsible for that condition; its survival and recovery needs; and explains if the species' current range-wide population is likely to persist while retaining the potential for recovery or is not viable;

2. The *Environmental Baseline*, which evaluates the current condition of the species in the action area relative to its reproduction, numbers, and distribution absent the consequences of the proposed action; the factors responsible for that condition; and the relationship of the action area to the survival and recovery of the species;

3. The *Effects of the Action*, which evaluates all future consequences to the species that are reasonably certain to be caused by the proposed action, including the consequences of other activities that are caused by the proposed action, and how those impacts are likely to influence the survival and recovery role of the action area for the species; and

4. *Cumulative Effects*, which evaluates the consequences of future, non-Federal activities reasonably certain to occur in the action area on the species, and how those impacts are likely to influence the survival and recovery role of the action area for the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the consequences of the proposed Federal action in the context of the species' current range-wide status, considering any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild. The key to making this finding is clearly establishing the role of the action area in the conservation of the species, and how the effects of the proposed action, taken together with cumulative effects, are likely to alter that role and the continued existence (i.e., survival) of the species.

Status of the Species

Hawaiian Goose or Nēnē (*Branta sandvicensis*)

Species Description
The nēnē is a medium-sized goose with an overall length of approximately 25 to 27 inches (in) (Banko et al. 1999, p. 2). The plumage of both sexes is similar (Banko et al. 1999, p. 2). This species is adapted to a terrestrial and largely non-migratory lifestyle in the Hawaiian Islands with limited freshwater habitat (Banko et al. 1999, p. 1). Adaptations to a terrestrial lifestyle include increased hind limb size, decreased forelimb size, more upright posture, and reduced webbing between the toes compared to other species of *Branta* (Banko et al. 1999, p. 1; Olson and James 1991, p. 42). Compared to the related Canada goose (*Branta canadensis*), nēnē wings are reduced by about 16 percent in size and their flight is not as strong (Banko et al. 1999, p. 9). Nēnē are capable of inter-island and high-altitude flight, but they do not migrate from the archipelago (Banko et al. 1999, p. 9).

Historic and Current Distribution
Nēnē were once widely distributed among the main Hawaiian Islands (island of Hawaiʻi, Maui, Lānaʻi, Molokaʻi, Kauaʻi, and Kahoʻolawe) (Service 2004, p. 6). However, by 1951, only about 30 nēnē remained on the island of Hawaiʻi (Smith 1952, p. 8). It is thought that nēnē populations on the higher islands, Maui and the island of Hawaiʻi persisted into the historical periods due to the availability of larger tracts of habitat in remote rugged upland areas, where hunting and predation by introduced mammals were less intense (Banko et al. 1999, p. 3). The release of captive-bred nēnē, which began in 1960, helped save the species from imminent extinction (Service 2004, pp. 2–3).

The release of captive-bred nēnē occurred at four different sites at different times on the island of Kauaʻi, resulting in four population centers. With the exception of the Nā Pali Coast population, all of the Kauaʻi populations are found at low elevations, ranging from sea level to 600 ft. Approximately 25 captive nēnē were released by Kipu Kai Ranch in 1985 on the southeast coastline of Kauaʻi. These birds were originally obtained from the Shipman Estates on the island of Hawaiʻi in the late 1960s. Another 38 captive-bred nēnē have been released at the Kīlauea Point National Wildlife Refuge (NWR) since 1991. These birds have bred successfully, and together these populations in 2004 were estimated to number 358 individuals. A third population was initiated on the Nā Pali Coast of northwestern Kauaʻi with the release of 62 captive nēnē from 1995 to 1996. The fourth population was a release of 24 nēnē to the Kīlauea Point NWR in April 2000, which has since increased to over 150 individuals. The 2022 statewide population of wild nēnē was estimated to be 3,545 individuals comprised of 1,034 on the island of Hawaiʻi; 2,199 on Kauaʻi; 306 on Maui; and 6 on Molokaʻi (NRAG 2022, in litt., entire). The number of nēnē on Kauaʻi increased from 1,891 in 2019 to 2,199 in 2022 (NRAG 2019, 2022, in litt., entire).

Life History
Nēnē currently occupy various habitats and vegetation community types ranging from coastal dune vegetation and non-native grasslands (e.g., golf courses, pastures, and rural areas) to

sparsely vegetated low and high-elevation lava flows, mid-elevation native and non-native shrubland, cinder deserts, native alpine grasslands and shrublands, and open and non-native alpine shrubland-woodland community interfaces (Banko et al. 1999, pp. 4–6). The current distribution of wild nēnē has been highly influenced by the location of release sites for captive-bred birds. On Kaua‘i, nēnē are primarily found utilizing lowland habitat, such as coastal wetlands at Hanalei and Hulē‘ia NWRs, with the exception of the Nā Pali Coast (Service 2004, pp. 15–19).

Nēnē have an extended breeding season with eggs reported from all months except May, June, and July (Banko et al. 1999, p. 12), however, most birds in the wild nest between October and March (Service 2004, p. 19). Nesting peaks in December and most goslings hatch from December to January (Banko et al. 1999, p. 12). Nēnē nest on the ground in a shallow scrape in the dense shade of a shrub or other vegetation. A clutch typically contains three to five eggs and incubation lasts for 29 to 31 days. Once hatched, young remain in the nest for one to two days (Banko et al. 1999, pp. 16–17). Fledging of captive birds occurs at 10 to 12 weeks but may take longer in the wild. During molt (March to June), adults are flightless for a period of four to six weeks and generally attain their flight feathers around the same time as their offspring. When flightless, goslings and adults are extremely vulnerable to predators, such as cats and dogs. From June to September, family groups join others in post-breeding flocks often far from nesting areas.

Nēnē reach sexual maturity at one year of age, but usually do not form pair bonds until their second year. Historical reports from the island of Hawai‘i indicate that nēnē bred and molted primarily in the lowlands during winter months and moved upslope in the hotter and drier summer months (Henshaw 1902, p.105; Perkins 1903; Munro 1944, pp.41–42; Banko 1988, p. 35). Reproductive success is relatively low in upland habitats on Maui and the island of Hawai‘i and higher in lowland habitat on Kaua‘i (Telfer 1995, 1996; Banko et al. 1999, p. 19).
Nēnē are browser-grazers; and the composition of their diet depends largely on the vegetative composition of their surrounding habitats. They appear to be opportunistic in their choice of food plant as long as they meet nutritional demands (Banko et al. 1999, pp. 6–8; Woog and Black 2001, p. 324). It is thought that this adaptability in their use of food items allowed nēnē to survive in marginal habitats to which they were relegated, as habitats that are more traditional were lost to humans (Black et al. 1994, p. 103; Banko et al. 1999, p. 6). However, it is believed that nēnē require a diverse suite of food availability that may include non-native and native vegetation (Banko et al. 1999, p. 6), due to the loss of traditional foraging habitats (Black et al. 1994, p. 103).

Threats to Nēnē

Current threats to nēnē include depredation of eggs and goslings by introduced mammals (i.e., cats, rats, dogs, pigs, and mongooses); limited availability of suitable habitat due to habitat loss, fragmentation, and degradation, especially lowland breeding habitat; insufficient nutritional resources due to habitat degradation; and human-caused disturbance (including habituation to humans) and mortality (especially deaths due to collisions with vehicles). Most nesting failures of wild nēnē on Hawai‘i and Maui are due to mongoose depredation (Hoshide et al. 1990, p. 154; Banko 1992, pp. 101–102; Black and Banko 1994, p. 400; Baker and Baker 1999, p. 8).

Mongooses kill incubating females (Banko 1992, p. 102) and rats are also a predator of nēnē eggs (Baker and Baker 1999, p. 12).

Hawaiian Stilt or Aeʻo (*Himantopus mexicanus knudseni*)

Species Description
The aeʻo is part of a superspecies complex of stilts (Family: Himantopus) and is considered a distinct subspecies of the black-necked stilt (*Himantopus mexicanus*) (Service 2011, p. 45). Aeʻo are slender wading birds, black above (except for the forehead), white below, and with distinctive long, pink legs. Sexes are distinguished by the color of the back feathers (brownish female, black male) as well as by voice, which is lower in females. Downy chicks are well camouflaged, tan with black speckling. Immature birds have a brownish back and white patches on their cheeks (Hawaii Audubon Society 2005, p. 49). The total length of adult aeʻo is about 16 inches with the mass of males and females averaging 7.0 ± 0.49 ounces (n=42) and 7.27 ± 0.77 ounces (n=43), respectively (Robinson et al. 1999, p. 16).

Historic and Current Distribution
Aeʻo were historically known from all the main Hawaiian Islands, except Lānaʻi and Kahoʻolawe (Service 2011, p. 46). No historical estimate of aeʻo population size is available, but by the early 1940, the statewide population was estimated to be between 200 and 1,000 birds (Service 2011, p. 46). However, these population estimates did not account for aeʻo present on Niʻihau and are therefore considered underestimates. Aeʻo are currently found on all the main Hawaiian Islands, except Kahoʻolawe. Though aeʻo census data show high year-to-year variability in the number of birds observed (Service 201l, p. 47), long-term census data indicate that the statewide population has been relatively stable or slightly increasing. Currently, this trend has continued and the statewide aeʻo population is stable to increasing with an average of approximately 1,500 birds over the 10-year period of 1998 to 2007 (DOFAW 1976-2008; Service 2011, p. 47-49). The data for aeʻo collected between 2006 and 2016 for winter and summer surveys show flucuations ranging from 1,400 to 2,200 individuals. Surveys where counts have surpassed 2,000 individuals have been followed in the subsequent year by a decrease of 300 to 700 birds (Service 2020a, p. 3). This variability in count numbers can be partially explained by variation in reproductive success and depredation. While the number of aeʻo counted on surveys has not consistently exceeded 2,000 individuals during winter or summer counts for at least 5 consecutive years, the population has remained relatively stable over the years (Service 2020a, p. 5).

Life History
Aeʻo use a variety of aquatic habitats but are limited by water depth and vegetation cover. They are known to use ephemeral lakes, anchialine pools, prawn farm ponds, marshlands, and tidal flats. Foraging habitat for the aeʻo is early successional marshland or other aquatic habitat with a water depth less than 9 inches and perennial vegetation that is limited and low growing. Native low-growing wetland plants associated with stilt nesting areas include *Bacopa monnieri* (water hyssop), *Sesuvium portulacastrum* (sea purslane), and the sedges *Cyperus laevigatus* (makaloa)

and *Bolboschoenus maritimus* (kaluha). Aeʻo use kalo ponds in the early stages of planting, but do not frequent closed canopy loʻi kalo (Service 2011, p. 59).

Aeʻo prefer to nest on freshly exposed mudflats interspersed with low growing vegetation (Service 2011, p. 57). Nesting also occurs on islands (natural and manmade) in freshwater or brackish ponds (Shallenberger 1977, p. 23, Coleman 1981, p. 42). The nest itself is usually a simple scrape on the ground but may also be a shallow bowl with vegetation and other debris (Shallenberger 1977, p. 24). Aeʻo have also been observed using sticks, small pebbles, shells, small dirt clods, and debris for nesting material (Coleman 1981, p. 53).

The aeʻo nesting season normally extends from mid-February through August, with peak nesting varying among years (Robinson et al. 1999. pg. 14). Aeʻo usually lay three to four eggs that are incubated for 23 to 26 days (Coleman 1981, p. 61, Reed et al. 1998, p. 37). Both parents take turns incubating the eggs day and night (Coleman 1981, p. 61; Shallenberger 1977, p. 24). Chicks are precocial and are able to walk and swim within a few hours of hatching (Coleman 1981, p. 77). Aeʻo chicks fledge about 28 days after hatching (Reed el al. 1999, p. 478). Young may remain with both parents as late as February of the year after hatch (Robinson et al. 1999, p. 19). First-year survival has been estimated at 0.55, with higher estimated mortality in the first two months compared with subsequent months (Reed et al. 2015, p. 179). Adult survival was similar for both sexes, with estimates of 0.79 for females and 0.80 for males (Reed et al. 2015, p. 179). The oldest females observed were seen 16 and 19 years after hatch. Six males lived to at least 16 years, with one observed 29 years after banding (Reed et al. 2015, p. 179). It is important to note that the aeʻo in this survival study were located at protected sites with predator control and public access management; in the absence of this active management survival rates are expected to be much lower (Reed et al. 2015, p. 183).

Aeʻo are opportunistic feeders. They eat a wide variety of invertebrates and other aquatic organisms available in shallow water and mudflats. Specific organisms taken include water boatmen (Corixidae), beetles (Coleoptera), possibly brine fly (*Ephydra riparia*) larvae, polychaete worms, small crabs, Mozambique tilapia (*Tilapia mossambica*), western mosquito fish (*Gambusia affinis*), and tadpoles (*Rhinella* spp.) (Service 2011, p. 59). Ephemeral ponds provide an immediate and short-term food supply with the emergence of invertebrates (Service 2011, p. 60).

Hawaiian Gallinule or ʻAlae ʻula (*Gallinula galeata sandvicensis*)

Species Description

The ʻalae ʻula is an endemic subspecies of the common gallinule (*Gallinula chloropus*). It is a dark gray bird with a black head and neck, and white feathers on their flanks and on their undertail coverts. They have a distinctive red frontal shield, and their bill tip is yellow with a red base. Their legs and feet are greenish and without lobes. The ʻalae ʻula usually measures about 13 inches in length and 11 to 16 ounces in mass, with males typically larger and heavier than the female (Bannor and Kiviat 2002, online p. 2). Both sexes are similar and have chicken-like cackles and croaks.

Historic and Current Distribution
No historical population estimates are available for the ‘alae ‘ula prior to the first biannual waterbird count by the State of Hawai‘i Division of Forestry and Wildlife (DOFAW) in 1977. Because they are such secretive birds, particularly when nesting, it is difficult to conduct population surveys for this species. It is believed that they were common on the main Hawaiian Islands, except Lāna‘i and Kaho‘olawe, in the 1800s but radically declined by the mid-1900s. Surveys from the 1950s through the 1960s estimated only 57 individuals (Engilis and Pratt 1993). Currently, ‘alae ‘ula inhabit Kaua‘i and O‘ahu (Service 2011, p. 37, DOFAW). The State attempted a reintroduction of six ‘alae ‘ula (three females and three males) on May 18, 1983, to the island of Moloka‘i at Kakahai‘a NWR. At least two birds were present in January 1984, but there have been no confirmed sightings since 1985 (Service 2011, p. 40).

‘Alae ‘ula generally occur in wetland habitats below 410 feet in elevation on Kaua‘i and O‘ahu. Biannual waterbird counts indicate the statewide population of ‘alae ‘ula is stable with an average of 287 birds over 10 years (1998 to 2007), but count numbers are extremely variable between summer and winter surveys (Service 2011). The 2016 summer surveys counted 596 birds on Kaua‘i and a total of 755 individuals throughout the State of Hawai‘i. The most recent minimum population estimate of ‘alae ‘ula is a 5-year average of 927 (678-1,235) individuals statewide from surveys between 2012 to 2016 (Service 2021a, p. 2). On Kaua‘i, the largest populations occur in the Hanalei and Wailua river valleys, Waiakalua Reservoir, and Wilcox Ponds (Service 2011, p. 40). ‘Alae ‘ula also occur in the irrigation canals on the Mana Plain of western Kaua‘i and in lo‘i kalo fields. While the State biannual survey numbers provide an idea of population trends, the counts are thought to be underestimates because of the species’ cryptic behavior. Standard survey methods in these counts include visual and aural detection. Recent research conducted by DesRochers et al. (2008) in 2005 through 2007 has shown that passive surveys of cryptic waterbirds underestimate numbers of individuals present in the wetlands. Alternatively, broadcasting vocalizations of cryptic waterbirds to elicit responses increases detection. On average this research has shown that broadcasting calls increased ‘alae ‘ula detection by 30 percent on the island of O‘ahu and 56 percent on the island of Kaua‘i.

Life History
‘Alae ‘ula are the most secretive of the native waterbirds, preferring to forage, nest and rest in dense late succession wetland vegetation. Most birds feeding along the water’s edge or in open water will quickly seek cover when disturbed. The preferred habitat for ‘alae ‘ula are lowland freshwater habitats, and declines have been observed in ponds where freshwater was converted to saltwater (Engilis and Pratt 1993). Key habitat features include interspersed dense stands of robust late succession vegetation near open water, floating or barely emergent mats of vegetation, and water depth less than three feet (Service 2011, pp. 45). ‘Alae ‘ula are opportunistic feeders and their diet likely varies with habitat, but includes algae, grass seeds, insects, snails, introduced fishes, crustaceans, mollusks, emergent grasses, and wetland plants (Service 2011, p. 44).

‘Alae ‘ula nest year-round but most activity occurs from March through August (Service 2011, p. 34). It is believed that the nesting phenology is related to water levels and late succession wetland vegetation. ‘Alae ‘ula usually lay an average of five to six eggs with the incubation period ranging from 19 to 22 days (Service 2011, p. 43). Re-nesting and multiple broods during one season have been observed (Byrd and Zeillemaker 1981). Platform nests are constructed in dense vegetation over water or near the edge. The species of emergent plant used for nest construction is not as important as stem density and vegetation height (Service 2011, p. 43). Kaua‘i kalo farmers reported that ‘alae ‘ula are not successful reproducing during winter months as they are during summer months, likely due to highly fluctuating water levels from rain and flooding (Greer 2006, p. 287). ‘Alae ‘ula make a great deal of noise when their nests are approached by predators, but if their nests are left unharmed and reproduction is a success, they will continue to use the nest for future broods (Greer 2006, p. 288). ‘Alae ‘ula are a precocial species; chicks are covered with down and are able to walk but are dependent on parents for several weeks. The lifespan of this species is unknown; however, an ‘alae ‘ula was recaptured after 10.5 years (Service 2011).

Hawaiian Coot or ‘Alae ke‘oke‘o (*Fulica alai*)

Species Description

The ‘alae ke‘oke‘o was considered a subspecies of the American coot (*Fulica americana*) but is now considered a distinct species (Service 2011, p. 19). Adults have a black head, a slate gray body with white undertail feathers, and a prominent white frontal shield and bill; feet are lobed rather than webbed and are greenish gray. No reliable measurements of total length or size are available; however, the ‘alae ke‘oke‘o is slightly smaller in body size than the American coot which averages 13 to 17 inches in total length and 15 to 30 ounces in mass (Pratt and Brisbin 2002, p. 34).

Historic and Current Distribution

The ‘alae ke‘oke‘o historically occurred on all of the main Hawaiian Islands except Lāna‘i and Kaho‘olawe, and were considered most numerous on O‘ahu, Maui, and Kaua‘i (Shallenberger 1977, p. 28). The ‘alae ke‘oke‘o population in 1977 was estimated at 2,500 birds (Shallenberger 1977, p. 28), and is currently estimated between 1,500 to 2,800 birds (DOFAW 1976-2008, Service 2011, p. 21). Looking at the survey data from the biannual waterbird counts from 1976 through 2007, the ‘alae ke‘oke‘o population has an overall slightly increasing trend (Service 2011, p. 22). While not all wetlands are surveyed, the counts are considered an accurate representation of the minimum population size. About 80 percent of the population detected in the surveys occur on the islands of Kaua‘i (Hanalei, Hulē‘ia, ‘Ōpaeka‘a), O‘ahu (coastal wetlands and reservoirs such as Lake Wilson and Nu‘uanu Reservoir, Kahuku Point and along the windward shore), and Maui (Kanaha and Keālia Ponds, Nu‘u Pond) (Service 2011, pp. 21-27). The remaining 20 percent of the population occurs in coastal ponds and playa wetlands, including breeding populations on Lāna‘i, Moloka‘i, and the island of Hawai‘i. Several authors have speculated that annual migration occurs between Kaua‘i and Ni‘ihau, but statewide surveys indicate that these movements are less frequent, usually occurring when annual precipitation is above normal and ephemeral lakes on Ni‘ihau become flooded (Engilis and Pratt 1993).

Numbers of ‘alae ke‘oke‘o counted on Ni‘ihau during wet winters include 949 birds in 1986 and 803 birds in 1996, but Ni‘ihau has not been surveyed since 1999 (Service 2005). The most recent minimum population estimate of ‘alae ke‘oke‘o is 1,815 (1,248-2,577) individuals (Service 2021b, p. 2).

Life History

‘Alae ke‘oke‘o generally occur within wetland habitats with suitable emergent plant growth interspersed with open water, especially freshwater wetlands, but also freshwater reservoirs, cane field reservoirs, sewage treatment ponds, taro loi, brackish wetlands, and limited use of saltwater habitats. Elevation ranges from the coastal plains at sea level to 850 feet, rarely to 3,500 feet (Service 2011, p. 33). However, on the island of Kaua‘i, some birds occur in plunge pools above 4,900 feet in elevation and on the island of Hawai‘i, stock ponds up to 6,600 feet in elevation.

The species typically forages in water less than 12 inches deep but will dive in water up to 48 inches deep (Service 2011, p. 33). ‘Alae ke‘oke‘o prefer to forage in water that is more open. They use logs, rafts of vegetation, narrow dikes, mud bars, and artificial islands for resting. Ephemeral wetlands support large numbers of ‘alae ke‘oke‘o during the non-breeding season.

Nesting habitat includes freshwater and brackish ponds, irrigation ditches, reservoirs, small openings in marsh vegetation, commercial prawn farm ponds and taro fields (Shallenberger 1977, p. 27). Floating nests are constructed of aquatic vegetation and found in open water or anchored to emergent vegetation (Byrd et al. 1985, p. 58). Open water nests are usually composed of mats of *Bacopa monniere* (water hyssop) and *Paspalum conjugatum* (Hilo grass) (Byrd et al. 1985, p. 58; Pratt and Brisbin 2002, p. 35). Nests in emergent vegetation are typically platforms constructed from buoyant stems of species such as *Scirpus* spp. (bulrush) (Byrd et al. 1985, p. 58). Average depth of water at ‘alae ke‘oke‘o nest sites was 13 inches in natural habitats (Byrd et al. 1985, p. 59).

Nesting occurs primarily from March through September, although some nesting occurs in all months of the year (Shallenberger 1977, p. 27; Morin 1998, p. 10). The timing of nesting appears to correspond with seasonal weather conditions (Byrd et al. 1985, p. 59; Engilis and Pratt 1993, pp. 154-155). Nest initiation corresponds to rainfall, as appropriate water levels are critical to nest success. Clutch size ranges from one to ten eggs, and young hatch after a 25-day incubation period (Byrd et al. 1985, p. 59; Shallenberger 1977, p. 27). Chicks swim from the nest soon after hatching but remain close to parents; immature birds have been seen with parents several weeks after hatching (Shallenberger 1977, p. 27). There is no information on the lifespan and survivorship of this species; however, banding records indicate the oldest American coot was at least 22 years old (Klimkiewicz and Futcher 1989, p.478).

‘Alae ke‘oke‘o are generalists and feed on land, grazing on grass adjacent to wetlands, or in the water. They have been observed grazing from the surface of the water or foraging by diving to obtain food resources (Shallenberger 1977, p. 27). Food items include seeds and leaves, snails, crustaceans, insects, tadpoles, and small fish. ‘Alae ke‘oke‘o will travel long distances, including between islands, when local food sources are depleted (Engilis and Pratt 1993, pp. 154-155).

Hawaiian Duck or Koloa Maoli (*Anas wyvilliana*)

Species Description
The koloa maoli is one of two extant endemic duck species (Family: Anatidae) found in Hawaiʻi from at least 13 species of endemic Hawaiian waterfowl known from the fossil record (Olson and James 1991, Burney et al. 2001). The koloa maoli is closely related to but genetically and morphologically distinct from the mallard (*A. platyrhynchos*) (Fowler et al. 2009). Both sexes of the koloa maoli are mottled brown and may resemble a small female mallard. Adult males have darker heads, with distinctive brown chevrons on the breast, flank and back feathers, and olive-colored bills (Engilis et al. 2002). Adult females are similar but are smaller than males on average and slightly lighter in color, with plainer, buff colored chin and back feathers.

Historic and Current Distribution
In the early 1900s, koloa maoli were common in the coastal marshes of all the main Hawaiian Islands except for Lānaʻi and Kahoʻolawe (Munro 1944). By the mid-1900s, the species had been reduced to 500 birds on Kauaʻi and a few isolated pairs on other islands (Schwartz and Schwartz 1953). In the mid-l950s, the State of Hawaiʻi began a captive propagation and release program for koloa maoli. From 1958 to 1990, 757 captive-bred koloa maoli were released on Oʻahu (326), Maui (12), and the island of Hawaiʻi (419) to repatriate the species within its former range (Giffin 1983). The koloa maoli release program was complicated by the problem of interbreeding with feral mallards (ornamental or farm ducks that have escaped or were released into the wild).

Recent genomic research indicates that duck populations on the islands of Oʻahu, Maui, Molokaʻi, and the island of Hawaiʻi are koloa maoli-mallard hybrids due to genetic intermixing with feral mallards (Service 2021c). However, ducks sampled on Kauaʻi appear to be pure or nearly pure koloa maoli, although recent genomic research suggest that there are some koloa maoli-mallard hybrids on Kauaʻi as well (Service 2021c). These results provide an example of how localized extinction is occurring in koloa maoli populations by introgressive hybridization. There are believed to be fewer than 2,000 pure koloa maoli remaining statewide, with most of these occurring on Kauaʻi (Service 2021c). On the island of Kauaʻi, the minimum population size for koloa maoli is approximately 947 (751-1,185) individuals (Service 2021c).

Life History
Koloa maoli are found from sea level to 9,900 feet elevation. The koloa maoli occurs in a wide variety of natural and artificial wetland habitats including freshwater marshes, flooded grasslands, montane stock ponds, streams, forest swamplands, taro patches, *Nelumbo nucifera* (lotus) farms, irrigation ditches, reservoirs, and mouths of larger streams (Service 2011). Since 2006-2007, significant wetland habitat improvements have been made for koloa maoli at Hanalei and Hulēʻia NWRs on Kauaʻi with the intent of providing optimal foraging, loafing, and breeding habitat. This has resulted in an overall increase in State biannual counts of koloa maoli for the Refuge from 2006 to 2015. Watershed protection and management is beneficial to koloa

because of the species' elevational range and use of wetland habitats from the coastal plain to mountain top.

Koloa maoli nest in lowland habitats on Kaua‘i as well as along stream banks and in the upper Alaka‘i swamp (Service 2011). Nests have also occurred in forests, kalo farming areas, managed wetlands, grasslands, and scrub/shrub; with associated topographic features like dikes, upland flats, dry wetland basins, and mountain ridges (Malachowski et al. 2018). Nesting generally occurs year-round, but peak nesting (up to 94 percent) occurs between September and May on Kaua‘i (Malachowski et al. 2019, p. 78) and March to July on the island of Hawai‘i (Giffin 1983). Koloa maoli usually nest on the ground in herbaceous and/or woody vegetation in wetland-associated uplands. Generally, 4 to 10 eggs are laid, with clutch size typically higher during the wet season (November to April) than the dry season (May to October) (Malachowski et al. 2018). Precocial ducklings hatch after 26 to 30 days of incubation, and ducklings attain flight after 65 to 70 days of protection and rearing usually by the lone female (Swedberg 1967, Giffin 1983).

Koloa maoli move between feeding and breeding habitats, and are known to fly between the islands of Kaua‘i and Ni‘ihau. The species typically forages in water less than six inches deep. Koloa maoli are opportunistic and their diet includes snails, aquatic insects, earthworms, grass seeds, green algae, and seeds and leaves of wetland plants. The koloa maoli duckling diet has never been studied. However, mallard ducklings eat mainly animal foods for the first 25 days of life (aquatic insects especially chironomids, small crustaceans, and mollusks) spending 65 to 80 percent of daylight feeding. After 20 to 30 days, seeds become more prominent in the mallard duckling diet (Drilling et al. 2002). Koloa maoli are found alone or in pairs and are wary, especially when nesting or molting. During the winter, koloa maoli may gather in larger numbers to exploit abundant food resources (Service 2011).

Threats to Hawaiian Waterbirds

The primary causes of decline for Hawaiian waterbirds are loss of wetland habitat, altered hydrology, alteration of habitat by invasive non-native plants, predation by introduced animals, over-hunting in the late 1800s and early 1900s, disease, and possibly environmental contaminants (Service 2011, p. iv-v). Currently, hybridization with feral mallards is the most serious threat to koloa maoli, while predation by introduced animals may be the greatest threat to the other Hawaiian waterbird species (Service 2004, p. 27; Service 2011, p. 77).

Loss and Degradation of Wetland Habitat

The greatest threat to waterbirds worldwide is the reduction in habitat quantity and quality (Parnell et al. 1988. p. 133). In Hawai‘i, a significant number of wetlands have been lost due to human activities, including filling and draining for agriculture, houses, hotels, and golf courses (Service 2011 p. 77). Statewide wetland loss in Hawai‘i is estimated at 15 percent, ranging from 6 to 8 percent on Maui, Moloka‘i, Kaua‘i, and the island of Hawai‘i to 65 percent loss on O‘ahu (Van Rees and Reed 2014, p. 335). Most of the wetland loss (44 percent) occurred in coastal areas (Van Rees and Reed 2014, p. 335), where most Hawaiian waterbird habitat exists. Most of the remaining wetlands are degraded by altered hydrology, invasive species, human

encroachment, and contaminants (Service 2011, p. 77-81).

Depredation
Depredation by introduced animals may currently be the greatest threat to all these Hawaiian waterbird species, except koloa maoli (Service 2004, p. 27; Service 2011, p. 77). Small Indian mongoose (*Herpestes auropunctatus*), cats, dogs (*Canis lupus familiaris*), rats, cattle egrets, non-native fishes, and bullfrogs are all presently found within wetlands and pose a serious threat to Hawaiian waterbird reproductive success by taking eggs, young birds, and even adults (Service 2011, p. 82-83). Small Indian mongooses (*Herpestes auropunctatus*) are not believed to be established on Kaua‘i, however three were captured in recent years (Phillips and Lucey 2016). Wetland areas that receive predator control have shown higher waterbird reproductive success and greater waterbird population densities (Underwood et al. 2014, p. 32). For example, after predator control was implemented at ‘Aimakapā Pond from 1993 to 1994, ae‘o fledgling success increased (Morin 1998, p. 20). Without active predator control, it is expected that survivability of waterbirds will be lower, particularly in the hatch-year class (Reed et al. 2015, p. 183).

Hybridization of Koloa Maoli with Feral Mallards
The greatest current threat to koloa maoli is genetic introgression (the introduction of genes from one species into the gene pool of another) through interbreeding with feral mallards; also referred to as hybridization (Service 2011, p. 85). The number of hybrids has shown to rapidly increase in recent years but may have been occurring for some time with the apparent increase due to greater recognition of the issue and more careful identification of duck-like birds (Service 2011, p. 85-97). Recent statewide genetic analyses indicate O‘ahu, Maui, Molokai, and Hawai‘i birds can be characterized as hybrid swarms, with all sampled populations on these islands being mallard-koloa hybrids (Wells et al. 2019). With Kaua‘i having the largest true koloa maoli population, it is extremely important to manage suitable habitat and protect the genetic integrity of Kaua‘i birds. This population is valuable as a potential source for translocation or captive breeding and reintroduction to other islands.

<u>Hawaiian Hoary Bat or ‘Ōpe‘ape‘a (*Lasiurus cinerus semotus*)</u>

Species Description
The ‘ōpe‘ape‘a is a medium-sized (0.5 to 0.8 ounces), nocturnal, insectivorous bat, with a wingspan of 10.5 to 13.5 inches. “Hoary” refers to the white-tinged, frosty appearance of the bat’s grayish brown or reddish-brown fur. Sexual dimorphism (females larger than males) has also been observed in ‘ōpe‘ape‘a collected across all Hawaiian Islands (Pinzari 2019). Additional morphological analyses are underway (Pinzari and Bonaccorso 2018, pers. comm.). ‘Ōpe‘ape‘a are not colonial, and roost solitarily in tree foliage (Service 1998).

The ‘ōpe‘ape‘a is classified under the Family Vespertilionidae of the Suborder Microchiroptera and is one of three recognized hoary bat subspecies. The other two subspecies are *Lasiurus cinereus cinereus*, one of the most common and widespread bats in North America, and *Lasiurus cinereus vilosissimus*, which occurs in South America and the Galapagos (Shump and Shump 1982). Jacobs (1996) reported morphological divergence in the ‘ōpe‘ape‘a from the North American subspecies involving characteristics related to flight and feeding. According to Jacobs (1996), the ‘ōpe‘ape‘a has a 45 percent reduction in body size with allometric responses in the size of its wings when compared to the continental North American subspecies, *L. c. cinereus*. The wing changes result in a lower ratio of weight to wing area, and are expressed as long, narrow wings relative to the continental North American subspecies. This physical trait permits slower and more maneuverable flight near vegetation and enduring flight in open areas. This increased flexibility in flight behavior has allowed the ‘ōpe‘ape‘a to expand its foraging habitat to include both open habitats like those of *L. c. cinereus,* and closed habitats not used by *L. c. cinereus*. Skeletal features related to feeding also diverge with ‘ōpe‘ape‘a having relative increases in the size of the mouth opening (gape), the size of the muscle that closes the jaw (masseter muscle) and the height of the coronoid process relating to the structure of the jawbone. These changes give the jaw more crushing power for more efficient processing of large and hard-bodied prey. This has enabled the ‘ōpe‘ape‘a, despite a marked reduction in body size, to include large, hard-bodied insects such as beetles, not taken by *L. c. cinereus* in its diet. Similarly, Barclay et al. (1999) found that ‘ōpe‘ape‘a use on average higher frequency calls (26.2-29.8 kHz) compared to *L. c. cinereus* (20.1 kHz).

The ‘ōpe‘ape‘a has been in Hawai‘i for at least 10,000 years and possibly as long as 1.8 million years (Russell et al. 2015; Baird et al. 2015). Genetic analyses indicate the species migrated from North America at least twice, and possibly more times (Russell et al. 2015; Bonaccorso and McGuire 2013). The population structure and genetic basis of these multiple migration events of the ‘ōpe‘ape‘a are currently being researched.

Three different publications have been released in the past few years that analyzed the genetic relationships of the ‘ōpe‘ape‘a, both within the larger Lasiurus complex and within the Hawaiian Islands (Russell et al. 2015, Baird et al. 2015, Baird et al. 2017). These studies indicate that two genetically distinct groups or clades of hoary bats - derived from different arrivals to the islands - exist within Hawai‘i. While both clades have been found on O‘ahu and Maui, no “pure” forms of the *L. c. cinereus* clade have been found on the other islands as of yet, although putative hybrids between the two clades have been found from the island of Hawai‘i (Baird et al. 2017). Very few samples have been tested from Kaua‘i, and no analyses of bats from Moloka‘i, Lāna‘i, or Kaho‘olawe have been published. Until the genetic differences and hybridization status are further resolved, the ‘ōpe‘ape‘a taxonomic classification follows the current listing status which is recognized as one subspecies across the State of Hawai‘i.

Historic and Current Distribution

The ‘ōpe‘ape‘a is endemic to the State of Hawai‘i and is the only existing terrestrial mammal. The ‘ōpe‘ape‘a was listed under the ESA based on perceived habitat loss and limited knowledge

of its distribution and life history requirements (Service 1970, 1998). At the time of listing there was no population estimate and no documentation of a population decline.

The ‘ōpe‘ape‘a is distributed across Kaua‘i, O‘ahu, Maui, Moloka‘i and the island of Hawai‘i, with breeding confirmed or highly likely to occur based on current monitoring data (Bonaccorso and Pinzari 2011; Wolfe 2018; Hosten and Poland 2018). ‘Ōpe‘ape‘a have been observed year-round in a wide variety of habitats and elevations below 7,500 feet, and a few sightings from limited surveys have been reported as high as 13,199 feet. Hawaiian hoary bats have been detected in both wet and dry areas of the island of Hawaii but seem to be more abundant on the drier leeward side (Jacobs 1994, p. 199) and generally less abundant in wet areas (Kepler and Scott 1990, p. 62). Three researchers examined spatial and temporal variation in occurrence patterns of bats in Hawaii, with conflicting conclusions about possible altitudinal or regional migration (Jacobs 1994, pp. 193-200; Menard 2001, pp. 1-149; Tomich 1986, pp. 1-30). However, recent vocalization data recorded over a period of five years (2007-2011) in 25 sample areas across the island of Hawaii indicate that bats concentrate in coastal lowland areas during the breeding season and migrate to highlands in the winter nonbreeding season (Gorresen et al. 2013).

Movement of bats between the major islands is thought to be infrequent (Pinzari and Bonaccorso, pers. com 2018). However, the high level of mobility of the ‘ōpe‘ape‘a within an island contributes to the resiliency of the species by lessening the impacts of localized threats and contributes to its continued survival and recovery. Island subpopulations likely provide a source of biological redundancy statewide, as it can provide for genetic exchange and representation. A study conducted by Gorrensen et al. (2013) from 2007 to 2011 suggests that the ‘ōpe‘ape‘a population on the island of Hawai‘i is stable to increasing. However, no population trends have been established for the other Hawaiian Islands.

Life History

Day-roost habitat requirements for the ‘ōpe‘ape‘a are tall (greater than 15 ft crown height), shady trees frequently including mature native *Metrosideros polymorpha* (‘ōhi‘a), but also including a wide variety of introduced species such as *Litchi chinensis* (lychee), various species of *Eucalyptus* spp. (eucalyptus), *Mangifera indica* (mango), and numerous other tree species (Bonaccorso et al. 2015). Roost trees noted from radio-tracked bats on Maui include *Eucalyptus globulus* (blue gum eucalyptus), *Spathodea campanulata* (African tulip tree), and *Cupressus macrocarpa* (Monterey cypress) (Johnston et al 2018).

The ‘ōpe‘ape‘a primarily feeds on nocturnal moths and beetles, which it hunts in flight across a wide array of habitat types and plant communities from sea level to at least 11,800 ft above sea level (Whitaker and Tomich 1983; Jacobs 1999; Todd 2012; Bonaccorso et al. 2015; Bonaccorso et al. 2016). Bonaccorso et al. (2015) found ‘ōpe‘ape‘a using foraging areas up to 571 ac in size with smaller, core use ranges of around 62 ac targeted within that larger landscape, with little to no overlap among individuals. Bats can use widely dispersed resources and move away from poor foraging conditions, such as heavy rain. Overall, bat activity and movements on the landscape are not determined by one variable, but an interaction of a complex array of

environmental factors. Seasonal changes in temperature, rainfall, wind, insect abundance, and energetic costs associated with reproduction of the ʻōpeʻapeʻa all play important roles in its movement and habitat use (e.g. Todd 2012; Gorresen et al. 2013; Bonaccorso et al. 2015; Gorresen et al. 2015; Bonaccorso et al. 2016; Todd et al 2016).

The physical structure of the spaces in which the ʻōpeʻapeʻa forages are also extremely varied, including forest gaps and clearings, forest edges along planted windrows of trees, above forest canopies, and along roads. These areas can occur in a range of habitats including undisturbed native forest, mature eucalyptus plantations having mixed understory trees and shrubs, lowland forest dominated by introduced trees, suburban and urban areas planted with ornamental trees, grassland/pasture, river gorges, arboretums, macadamia nut orchards, and coastal bays (Bonaccorso et al. 2015; Gorresen et al. 2013).

The lifespan of the solitary ʻōpeʻapeʻa is estimated to be between 4-10 years (Bonaccorso 2016). The average number of pups produced each year is estimated to be 1.8 and survival rate is estimated to be 30 percent. Thus, ʻōpeʻapeʻa reproductive success is estimated at 0.5 pups per female. The ʻōpeʻapeʻa breeding activity takes place between April and August, with pregnancy and the birth of two (or occasionally one) pups, occurring from April to June (Bogan 1972). The pups are completely dependent on the female until weaning at three months of age. Lactating females have been documented from June to August, and a female tending pups has been observed in early September (Pinzari 2015, pers. comm). The ʻōpeʻapeʻa pupping season is June 1 through September 15, when mature females are likely caring for dependent young.
Several studies have examined ʻōpeʻapeʻa movement and habitat use across the islands (Todd 2012, Gorresen et al. 2013, Bonaccorso et al. 2015, Gorresen et al. 2015, Bonaccorso at el. 2016, Todd et al. 2016). The median core use area for a male bat was estimated as 20.3 ac based on raw data from Bonaccorso et al. (2015) and excluding data from juvenile individuals without established core use areas (DOFAW 2015; Bonaccorso et al. 2015). Female ʻōpeʻapeʻa may have overlapping core use areas (Bonaccorso et al. 2015).

Threats to ʻŌpeʻapeʻa
Expansion of land-based wind energy facilities is the greatest known source of mortality of the ʻōpeʻapeʻa. As of June 2018, there have been 76 observed ʻōpeʻapeʻa fatalities at the six facilities monitoring and reporting take of bats; these data reflect a likely take amount of 90 to 164 bats across three islands where wind energy projects are located. There are wind turbine facilities on Oʻahu, Maui, and the island of Hawaiʻi. The majority of impacts occur on Oʻahu and Maui. No wind turbine facilities are planned for Kauaʻi, Molokaʻi, of Lānaʻi (Service 2020b). Other threats include habitat loss, tree trimming and cutting during the period when pups are non-volant, entanglement on barbed wire fences, pesticides and rodenticides, competition from invasive species, such as coqui frogs, and potentially predation from native and non-native owls and hawks, as well as non-native rats and cats (Service 1998).

Environmental Baseline
Regulations implementing the ESA (50 CFR 402.02) define the environmental baseline as the past and present impacts of all federal, state, or private actions and other human activities in the action

area. Also included in the environmental baseline are the anticipated and/or ongoing impacts of all proposed federal projects in the action area that have undergone Section 7 consultation, and the impacts of state and private actions which are contemporaneous with the consultation in progress.

Status of Nēnē within the Action Area

Bi-weekly surveys of nēnē are conducted at 44 locations across PMRF Barking Sands. There are 24 survey sites located in the south end, 14 sites in the central portion and 6 sites in the north end. Nēnē distribution on Barking Sands is concentrated in the southern portion of the installation due to attractive habitat. Survey averages reflect a stable nēnē population at Barking Sands, with a low of 20.5 nēnē in 2017 and a high of 40 nēnē in Fiscal Year (FY) 2022 (Figure 8) (FY is October 1 through September 30). Based on these surveys, there are seasonal fluctuations of nēnē presence on Barking Sands, with a typical dip in numbers from February through April. Nēnē presence increased during the pre-breeding season (August to November) with a peak from November to January (Figure 9).

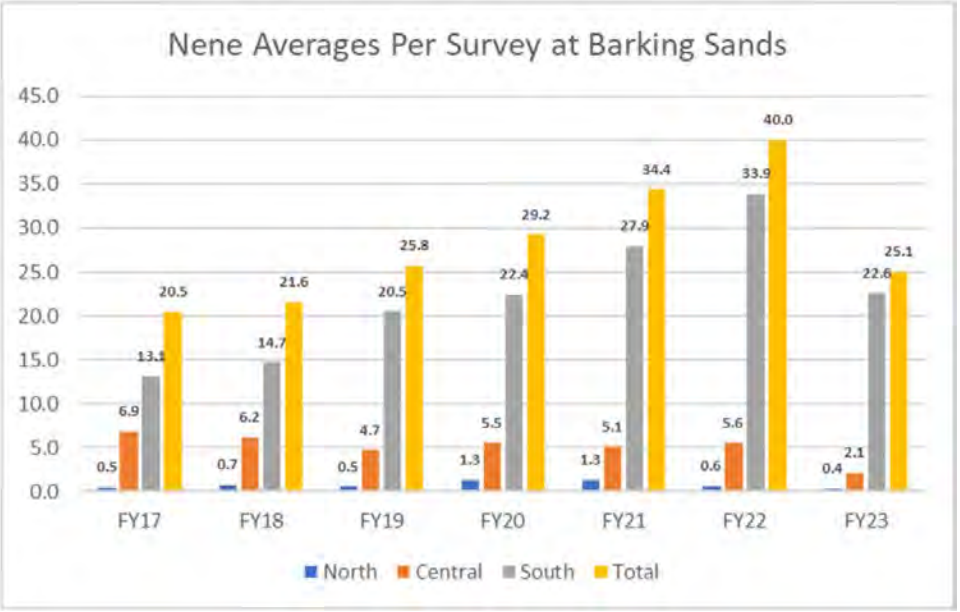

Figure 8. Nēnē bi-weekly survey averages by geographic area at Barking Sands from FY 2017 to 2023.

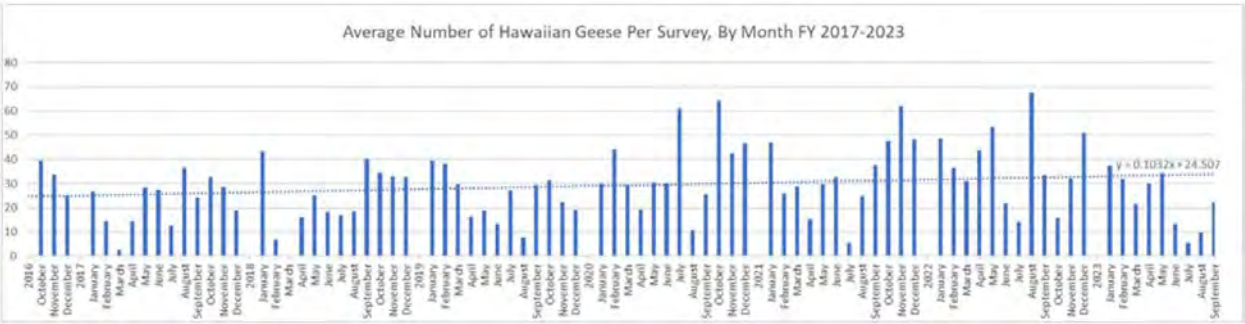

Figure 9. Trend of nēnē presence at Barking Sands by month from 2016 to 2023.

Nēnē nesting events at Barking Sands have been increasing each breeding season, with a total of 39 nests during the breeding season of FY 2022 and 43 nests during the FY 2021 breeding season (40 nests and 1 nest cup at PMRF Barking Sands, and 2 nests at Makaha). Data from FY 2017 to FY 2023 shows 76.9% of nests successfully hatched, with an average hatch rate of 2.17 goslings. Nēnē at PMRF have an average fledge rate of 1.97 goslings per family. Because young nēnē exhibit strong natal site fidelity in choosing breeding locations, it is anticipated that nesting events will correlate to larger nēnē populations on Barking Sands and Makaha in future years.

Nēnē are most observed at the sewage Oxidation Pond and Kinikini Ditch at PMRF Barking Sands, however they are also seen foraging along roadways and in open grassy areas in the central and southern portions of PMRF Barking Sands. Nēnē have established nests throughout PMRF Barking Sands, with most nests occurring adjacent to the sewage Oxidation Pond, in the dry, grassy basins (Figure 10). Nests have been recorded near the Hawai‘i Air National Guard (HIANG) Complex and Aegis Ashore complex, which is adjacent to the section of Nohili Road with the highest nēnē strikes. Nēnē are also recorded on Makaha Ridge Tracking Station, with an average of 5 nēnē documented during surveys. Nēnē have been observed infrequently at the Kōke‘e sites. No nēnē have been recorded at Port Allen, Kamokala Ridge Magazines, and Miloli‘i Ridge sites.

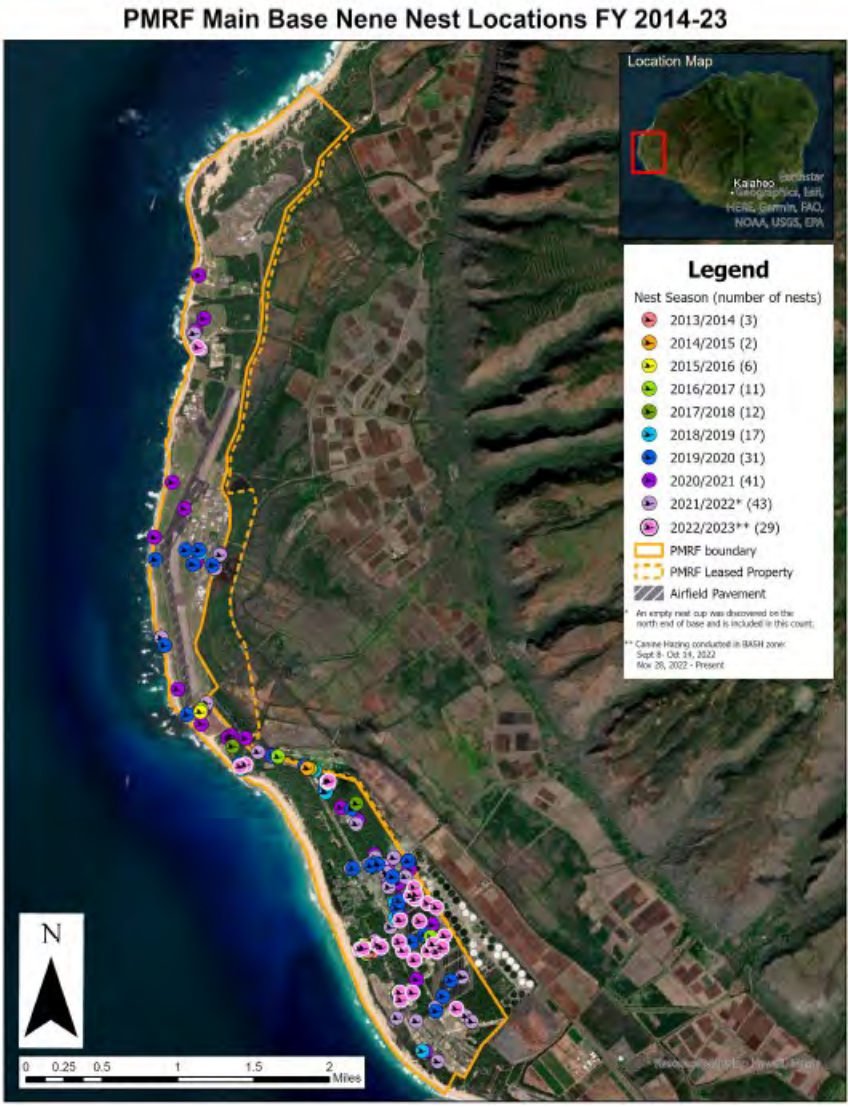

Figure 10. Nēnē nest locations at Barking Sands from FY 2014 to 2023.

<u>Status of Hawaiian Waterbirds within the Action Area</u>

All species of Hawaiian waterbirds (ae‘o, ‘alae ‘ula, ‘alae ke‘oke‘o, koloa maoli) at PMRF use similar areas of the action area, therefore the status of these species within the action area is summarized in one section. Hawaiian waterbirds regularly forage and loaf in the aquatic areas of PMRF Barking Sands, consisting of the agricultural drainage ditches (Nohili and Kinikini Ditches) and the sewage Oxidation Pond in the southern section of the base. Ae‘o have been observed on the eastern side of Nohili Road from Major’s Bay to the HIANG Complex during heavy rainy periods.

The Oxidation Pond has been regularly surveyed since March 2012, with an average of five surveys conducted per month over an 11-year period. Results of these surveys have indicated a

mean of 7 aeʻo and 14 ʻalae keʻokeʻo at the Oxidation Pond per survey, with a high count of 34 aeʻo (April 2019) and 33 ʻalae keʻokeʻo (May and June 2019). The pond is used to a lesser extent by Koloa maoli. While no koloa maoli nests have been detected within the Oxidation Pond complex, family groups have been detected on and around the pond frequently. ʻAlae ʻula have not been observed using the Oxidation Pond but occur exclusively in the agricultural drainage ditches on the base.

Nesting events or young waterbird families (presumed nesting) have been documented at PMRF Barking Sands at the Oxidation Pond and Kinikini Ditch. ʻAlae keʻokeʻo nests were detected in both areas (6 at Oxidation Pond/2 at Kinikini Ditch in FY 2018, 2/1 in FY 2019, 3/0 in FY 2020, 6/0 in FY 2021, 1/0 in FY 2022, and 4/0 in FY 2023). Koloa maoli family groups were also documented in both areas respectively (4 at Oxidation Pond/0 at Kinikini Ditch in FY 2018, 5/0 in FY 2019, 9/0 in FY 2020, 4/1 in FY 2022 and 5/2 in FY 2023). ʻAlae ʻula nests that were detected were all found at the Kinikini Ditch (3 in FY 2018, 3 in FY 2019, 1 in FY 2020, 3 in FY 2021, 1 in FY 2022, and 1 in FY 2023.

Status of ʻŌpeʻapeʻa within the Action Area

A comprehensive acoustical survey of PMRF, including sites at Barking Sands, Mākaha Ridge, and Kokeʻe, demonstrated year-round use of all these areas by ʻōpeʻapeʻa, although different seasonal values indicate varying use throughout the year (Bonaccorso and Pinzari 2011). ʻŌpeʻapeʻa appeared to be using low elevation habitats (Barking Sands) primarily during the summer and fall, but then showed increased activity at higher elevations (Mākaha Ridge and Kokeʻe) during the winter months (Bonaccorso and Pinzari 2011).

ʻŌpeʻapeʻa were also detected in acoustical surveys at Kekaha Firing Range (KFR), which is adjacent to PMRF Barking Sands' southern border (Montoya Aiona et al. 2020). Peak frequency of ʻōpeʻapeʻa detection at KFR was generally observed from May through October coinciding with pregnancy (May to June), lactation (July to August), and fledgling/post lactation period (September to October). Foraging activity was also observed via feeding "buzzes", with highest numbers occurring from August through October.

Effects of the Action

The likely effects to nēnē, Hawaiian waterbirds, and ʻōpeʻapeʻa include effects associated with the following proposed activities: 1) air operations; 2) BASH management activities; 3) hazing and nest removal near launch pads; 4) use of driving range and athletic fields; 5) oxidation pond management and upgrades; 6) vehicular driving; 7) vegetation maintenance; 8) construction activities; 9) hazing for bird protection and safety; 10) PMRF hunting program; 11) predator control program; and 12) barbed wire fencing. Each stressor and benefit caused by the proposed actions may have consequences to nēnē, Hawaiian waterbirds, and ʻōpeʻapeʻa. The consequences of the proposed actions on each species (when applicable) are discussed below.

Consequences of the Proposed Action

Effects Associated with Air Operations

Air operations are expected to have adverse impacts to nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli) as this activity is likely to result in direct aircraft strikes to these species. Nēnē are commonly observed in Kinikini Ditch near the runway and have nested within the vicinity of the airfield in the past. Nēnē are large-bodied birds with a low flight pattern and flocking behavior, which deems them high risk for air operations. Nēnē are relatives to Canada geese, which rank within the top 5 most hazardous species to aviation nationwide for both civilian and military aircraft (FAA 2018). Additionally, nēnē have proven highly adaptable and comfortable using human-altered habitats, which increases their risk to aircraft operations due to habituation. Most aircraft strikes (78%) occur below 1,000 ft above ground level (AGL), with 50% of those strikes occurring below 100 ft AGL (FAA 2013). The typical flight altitude of nēnē (328 ft. AGL) increases their hazard potential to aircraft at PMRF, specifically during take-off and landing (Banko et al. 2020).

All four Hawaiian waterbird species are commonly observed in Kinikini Ditch at the south end of the runway, and occasionally walk onto the runway creating a BASH risk. Hazing events at PMRF from 2015-2020 show that aeʻo and koloa maoli are the primary waterbirds hazed in relation to BASH management. In 2021, a Wildlife Hazard Assessment (WHA) for PMRF was completed for BASH risk. The WHA identified the nēnē and Laysan albatross as the two highest risk species to aircraft operations at PMRF Barking Sands. ʻAlae ʻula and ʻalae keʻokeʻo were determined as very high risk, koloa maoli as high risk, and aeʻo as moderate risk.

Between 2014 and 2021 there were 56 documented bird-aircraft strikes or near misses on the PMRF airfield (Figure 11). These incidents involved 12 different bird species, with nēnē involved in 3 near misses and 1 aircraft strike in 2020-2021. In September 2020, there was one aborted take-off due to 7 nēnē within the airfield AOA, and one air traffic control wave-off of an aircraft landing due to nēnē presence. In October 2020, there was another air traffic control wave-off of an aircraft landing due to nēnē presence. On 24 August 2021, the airfield reported its first nēnē strike involving a flock of 3-4 nēnē that hit the nose of a C-26D aircraft while approaching the PMRF runway resulting in a nēnē mortality. Nēnē presence on the airfield has been increasing, with over 100 nēnē hazed in one day in May 2021 within the airfield AOA. In all situations of nēnē involved in a near miss or aircraft strike, hazing was conducted the day of the incident.

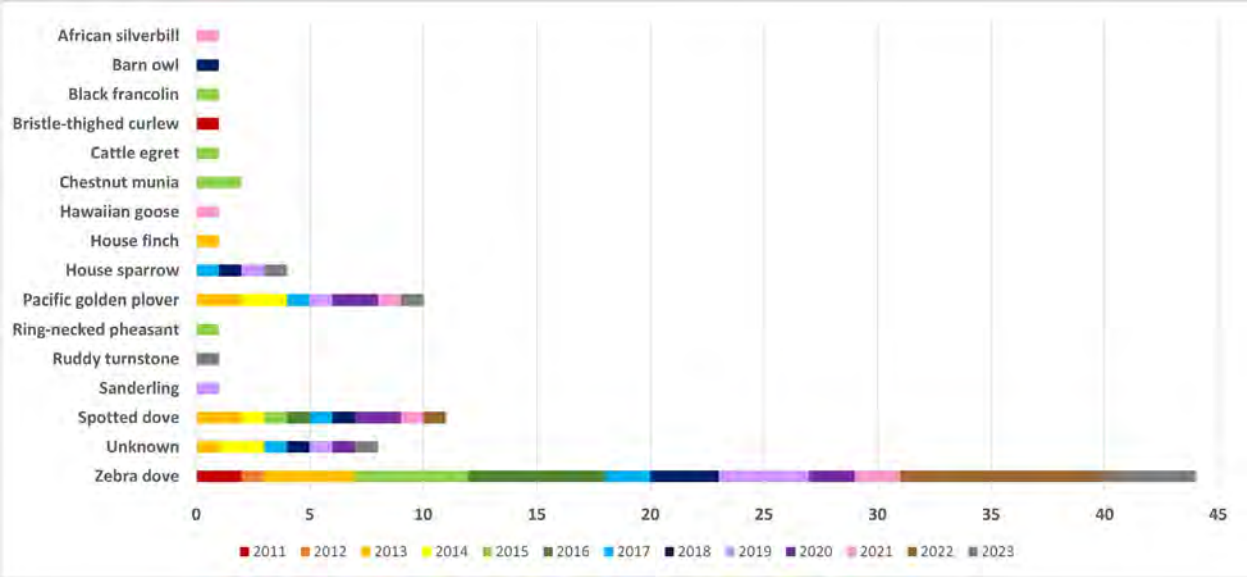

Figure 11. PMRF Airfield Strike and Near Miss Data from 2014 to 2023.

With the re-paving of the airfield, air operations are expected to increase at Barking Sands, which will increase the risk of aircraft strikes to wildlife. Air operations will rely on BASH management activities to reduce the likelihood of aircraft strikes to wildlife. However, despite these activities, aircraft strikes to wildlife are still expected to occur.

To estimate the number of aircraft strikes on nēnē and Hawaiian waterbirds at PMRF, we used data of the past documented bird-aircraft strikes or near misses at PMRF airfield. Based on this data, there have been incidents of 3 near misses and 1 aircraft strike over the course of a one-year period for nēnē (2020-2021). The 1 aircraft strike involved a flock of 3-4 nēnē. Considering the proposed BASH management activities and the increase in flight operations, we anticipate that up to 1 aircraft strike per year could occur for nēnē. Due to the past incident involving 4 nēnē individuals, it is anticipated that an average of up to 4 nēnē individuals per year may be taken in the form of injury or mortality due to aircraft strikes. Similarly, we anticipate that up to 1 aircraft strike per year could occur for each of the four Hawaiian waterbird species. However, due to their smaller population sizes near the airfield compared to nēnē, it is anticipated that up to 1 individual per year for each Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli) may be taken in the form of injury or mortality due to aircraft strikes.

<u>Effects Associated with BASH Management Activities</u>
BASH management activities are anticipated to have effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). Specifically, adverse effects are expected from the nēnē nest removal. Effects associated with BASH hazing for Hawaiian waterbirds, BASH hazing for nēnē, and habitat modification and exclusion are not anticipated to rise to the level of adverse effects. The effects of each activity on the relevant species are discussed in the following subsections.

Habitat Modification and Exclusion

Habitat modification and exclusion projects will be implemented as a BASH management activity to reduce the attractiveness of hazardous areas to listed species. Nēnē and all four Hawaiian waterbird species are known to use the proposed project areas. All habitat modification and exclusion projects will require a nest survey by a qualified biologist prior to commencement of work, and no work will commence within 100 ft of an active listed species nest. Additionally, a biological monitor will be present during vegetation removal work to ensure work is conducted outside of the 100 ft buffer. By implementing these conservation measures, adverse impacts to nēnē and the four waterbird species are highly unlikely to occur and are considered discountable. Therefore, it is expected that effects associated with habitat modification and exclusion as a BASH management activity may affect but are not likely to adversely effect nēnē and all four Hawaiian waterbird species.

BASH Hazing for Hawaiian Waterbirds

All four species of Hawaiian waterbirds are commonly observed in Kinikini Ditch at the south end of the runway, creating a BASH risk. Proposed BASH hazing methods for Hawaiian waterbirds include pyrotechnics, noise makers (sirens, horns, clapping), mylar tape, flags, effigies, air dancers, balloons, access control (net, fence), static deterrents (geotech cloth), vehicle harassment and on foot harassment. To date, koloa maoli and aeʻo are the only Hawaiian waterbirds that have been hazed at PMRF as a part of the BASH program. However, ʻalae ʻula and ʻalae keʻokeʻo are likely to be hazed in the future due to their presence in the proposed hazing areas. BASH hazing of Hawaiian waterbirds is proposed when they are observed on the airfield or within 750 ft from the runway and determined to be a direct risk to flight operations.

When hazed, Hawaiian waterbirds are expected to be startled, disturbed, and to temporarily abandon their normal behavior and the areas they currently occupy. They may be stressed, miss feedings, miss provisioning their young, or may leave the area. However, these disruptions to their normal behavior would not result in reduced fitness, physical injury, or mortality because the disruptions are temporary. Hazing of Hawaiian waterbirds will be conducted by trained personnel that will avoid injuring or harming birds by following the protocols outlined in Appendix A. While hazing may disrupt birds from their normal behavior, it is not expected that the proposed hazing will reduce the fitness or survivorship of Hawaiian waterbirds. Additionally, BASH hazing will remove Hawaiian waterbirds from hazardous areas and reduce the risk of injury or death from aircraft strikes. Considering the hazing activities as proposed and their associated conservation measures, we do not expect the project to result in any meaningful disruption to their normal behaviors, nor any measurable reduction in reproductive success or reduced fitness. Therefore, effects to all four Hawaiian waterbird species associated with BASH hazing are expected to be insignificant.

BASH Hazing for Nēnē

BASH hazing for nēnē will occur year-round, with increased efforts prior to and during the nēnē breeding season (September-April). Hazing is conducted by trained staff utilizing techniques in Table 1. Majority of the techniques as described are authorized by the nēnē 4(d) rule. However, hazing of brooding adults (e.g., adults with an active nest or gosling) and/or adults in molt is prohibited under the nēnē 4(d) rule. PMRF is proposing to implement hazing of gravid females

not actively nesting, families with mobile young, breeding pairs and/or molting adults within 8,000 ft. of the airfield (nēnē family hazing zone). The techniques proposed within the nēnē family hazing zone include vehicle harassment (excluding families with mobile young), on-foot harassment, noise making (i.e., sirens, horns, clapping), and static deterrents (i.e., flags, mylar tape, scarecrow, inflatable dancers, balloons). These hazing techniques will be implemented with the understanding that these individuals are vulnerable and will be hazed with extra care.

When hazed, gravid females not actively nesting, families with mobile young, breeding pairs and molting adults are expected to be startled, disturbed, and temporarily abandon their normal behavior and the areas they currently occupy. Similar to effects on Hawaiian waterbirds noted above, nēnē may be stressed, miss provisioning their young, or leave the area. However, these disruptions to their normal behavior will be temporary and are not expected to result in physical injury or mortality as proposed. Additionally, BASH hazing will remove nēnē from hazardous areas, deter nesting near the airfield, and ultimately reduce the risk of injury or death from aircraft strikes. Considering the hazing activities as proposed and their associated conservation measures, we do not expect the project to result in any meaningful disruption to their normal behaviors, nor any measurable reduction in reproductive success or reduced fitness. Therefore, effects to nēnē associated with BASH hazing are expected to be insignificant.

Nēnē Nest Removal Zone

The nēnē nest removal zone (NNRZ) is expected to have adverse effects on nēnē. PMRF has coordinated to establish the NNRZ that extends 750 ft on either side of the runway centerline, 150 ft on either side of the taxiway's centerlines, and 100 ft from the edge of aircraft parking aprons (Figure 4). PMRF is proposing to remove nēnē nests within the NNRZ, which would result in direct mortality from the destruction of the eggs in the nest. In the event a nēnē establishes a nest inside the proposed NNRZ, PMRF NR will notify the Service within 24 hours. PMRF will determine the stage of nest development and timing for nest removal, if determined necessary, and follow procedures described in Appendix A.

To estimate the number of nests destroyed by nest removal, we considered past nesting data within the NNRZ, nēnē population trends at PMRF Barking Sands, and conservation measures being implemented to deter nesting. From 2014 to 2022, there were a total of 14 nests documented within the proposed NNRZ boundary with a range of between 0 to 6 nests per year. Given the relatively large range of nests in this area per year, we estimated both an average and maximum number of nests that may be destroyed. Over that 8 year period, there was an average of 1.75 and maximum of 6 nests documented per year within the proposed NNRZ boundary. Conservation measures to deter nesting in this area will include various hazing techniques, vegetation maintenance, and habitat modification and exclusion projects. Considering the increase in nēnē population at PMRF Barking Sands, despite the conservation measures being implemented, it is likely that the number of nēnē nests established in these areas may slightly increase. Therefore, it is anticipated that up to an average of 3 nēnē nests per year and maximum of 7 nēnē nests in one year may be taken in the form of mortality due to nest destruction within the NNRZ.

Effects Associated with Hazing and Nest Removal Near Launch Pads

Effects associated with this activity are expected for nēnē, as they are the only species that utilize the areas near launch pads at PMRF Barking Sands. The proposed hazing near launch pads at PMRF Barking Sands involves hazing nēnē within 500 ft from a launch site or live fire activity when these activities are scheduled within 30 days. Hazing would be conducted by trained personnel and will use the techniques outlined in Table 2. Use of these hazing techniques near launch pads are expected to be compliant with the nēnē 4(d) rule and will not involve brooding/molting adults. However, numerous launch pads are within 8,000 ft of the airfield (designated as the nēnē family hazing zone). Therefore, in instances when hazing of brooding/molting adults is necessary near launch pads, the techniques described for the nēnē family hazing zone (Table 1) will be used. Effects of hazing techniques used in the nēnē family hazing zone were described and analyzed in the previous section (BASH Hazing for Nēnē).

Nest removal near launch pads is expected to have adverse effects on nēnē. PMRF is proposing to include a 200 ft buffer around launch sites or live fire areas. If a nest is found within this buffer with a launch or live fire activity scheduled within 30 days, it may be considered for removal. The nēnē nest will only be removed if the launch or live fire activity is not able to be delayed or relocated and it is determined to be a safety risk for the mission activity. This would result in direct mortality from the destruction of the eggs in the nest. In some scenarios, it may be determined that nest removal is not required and the nest will be monitored to document any potential effects from the activity. In that scenario, without an appropriate buffer (100 ft) around the nest to exclude disturbing activities there is likely to be injury or mortality of eggs in the nest due to nest failure or abandonment as a result of disturbance from the launch or live fire activities.

To estimate the number of nests destroyed by nest removal and number of nests that could be abandoned due to disturbance from launch or live fire activities, we considered past nesting data and conservation measures being implemented to deter nesting near launch pads. Based on past nesting data, the majority of nēnē nesting at PMRF Barking Sands has occurred in the southern portion of the base away from the launch pads. Since FY14, there have been less than 10 nēnē nests documented north of the airfield, where the launch pads are located. Additionally, conservation measures such as hazing and ongoing vegetation maintenance will reduce or maintain this low level of nēnē nesting near launch pads. Considering nēnē nesting is expected to remain low near launch pads, we anticipate that very few nēnē nests will be destroyed or could be abandoned due to this activity. Therefore, it is anticipated that up to 1 nēnē nest per year may be taken in the form of mortality due to nest destruction near launch pads; and up to 1 nēnē nest per year may be taken in the form of injury or mortality due to nest failure or abandonment as a result of disturbance associated with launch or live fire activities.

Effects Associated with Use of Driving Range and Athletic Fields

The use of the driving range and athletic fields are anticipated to have effects on nēnē that do not rise to the level of adverse effects. Hawaiian waterbirds are not expected to be impacted by this activity as they have not been observed in these areas, with their nearest observations occurring

at the Oxidation Pond over 0.6 miles away. Nēnē have been observed foraging within the vicinity of these areas. However, no documented nests have ever been recorded on the driving range or athletic fields. This activity involves the risk of nēnē being accidentally struck by a golf ball. However, due to the infrequent use of the driving range and by implementing the conservation measures above (i.e., installing signage, and ceasing ball striking if nēnē are observed), adverse impacts are highly unlikley to occur and are considered discountable. Therefore, it is expected that effects associated with the use of driving range and athletic fields may affect, but are not likely to adversely affect nēnē.

Effects Associated with Oxidation Pond Management and Upgrades

Oxidation Pond management and upgrades may include activities such as flushing of the ponds and dredging of accumulated sludge to reduce the occurrence of anaerobic conditions that lead to avian botulism. One project in particular, the Oxidation Pond re-lining project, is expected to have adverse effects on the nēnē, ʻalae keʻokeʻo, and koloa maoli. The project description above mentions hazing occurring associated with this project. Hazing associated with the Oxidation Pond re-lining project is analyzed in the "Hazing for Bird Protection and Safety" section below, as this type of hazing is described in that section (i.e., hazing near activities [construction equipment operation] that may cause injury or mortality).

Nēnē, ʻalae keʻokeʻo, and koloa maoli are known to occur at the Oxidation Pond complex. Nēnē have been documented nesting in the adjacent dry, grassy, basins; and ʻalae keʻokeʻo have nested along the edge of the main Oxidation Pond and in the outfall basin. While no koloa maoli nests have been recorded here, families with young ducklings use the main pond and outflow basin and are believed to be nesting near the complex.

The Oxidation Pond re-lining project is likely to cause disturbance to the nēnē, ʻalae keʻokeʻo, and koloa maoli in the vicinity. Conservation measures include vegetation removal to reduce suitable nesting habitat and conducting nest surveys prior to construction activities. If a nest is discovered within the project footprint, a determination will be made if a 100 ft buffer can reasonably be implemented and prevent disturbance within that buffer until the chick(s)/gosling(s) have hatched and safely leave the nest site. However, if a buffer cannot be implemented, work will continue in the area up to the nest site. In cases where a buffer cannot be implemented, the disturbance caused by construction activities may lead to nest abandonment.

To estimate the number of nests that could be abandoned from disturbance caused by construction activities, we used data of nests documented at the Oxidation Pond for each species. We also considered the estimated length of the project (6-8 months) and the proposed conservation measures being implemented. Data has shown that within the past five years, the maximum number of nests observed annually for each species at the Oxidation Pond are as follows: 6 for nēnē in FY22, 6 for ʻalae keʻoʻkeʻo in FY21, and 9 observations of family groups (0 nests) for koloa maoli in FY20. By implementing the conservation measures above, such as vegetation removal to reduce suitable nesting habitat, we expect a significantly a smaller number of nests than those maximum numbers to occur during this project. Additionally, by conducting nests surveys, and implementing a 100 ft buffer around nests when feasible, the number of nest

abandonments caused by disturbance for each species is expected to be minimal. Therefore, it is anticipated that up to one nest of each species (nēnē, ʻalae keʻokeʻo, and koloa maoli) may be taken in the form of injury or mortality due to nest failure or abandonment because of disturbance associated with the Oxidation Pond re-lining project.

Effects Associated with Vehicular Driving

Vehicular driving occurs at all PMRF sites at varying levels and is expected to have adverse effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). Vehicular driving has proven to be a larger concern to wildlife than previously thought, particularly at PMRF Barking Sands. This site has the highest use of vehicular driving compared to other PMRF sites.

Vehicle strikes for nēnē, and all four Hawaiian waterbird species have been documented at PMRF (Figure 12). Additionally, nēnē populations have increased across Kauaʻi and at PMRF in recent years, increasing the risk for vehicle strikes. There have been numerous conservation measures completed at PMRF Barking Sands to address this issue, such as rumble strips, reduced speed limits, increased speed limit enforcement, and increased awareness. Additional conservation measures proposed include installation of traffic calming measures at high-risk locations, speed bumps, signage, and a moveable LED sign. Hazing will also be implemented for bird protection and safety to reduce the risk of vehicle strikes in hazardous areas. Despite all these measures, vehicle strikes to these species are likely to occur.

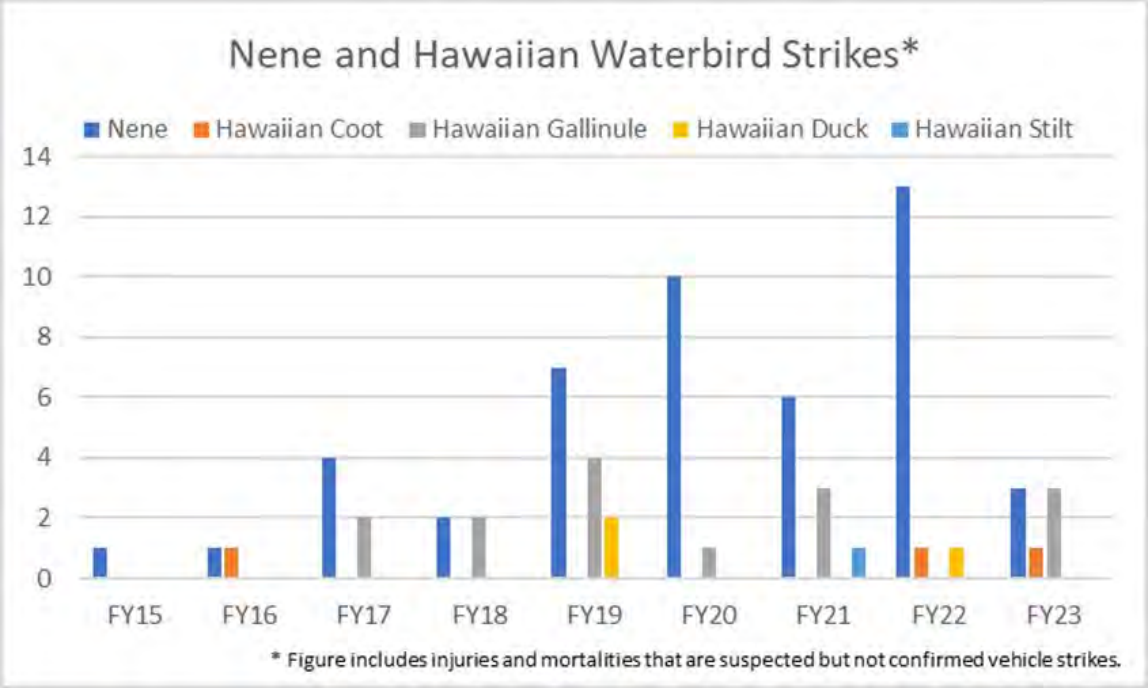

Figure 12. Nēnē and Hawaiian waterbird vehicle strikes at PMRF from FY 2014 to 2023.

To estimate the number of nēnē that could be injured or killed due to vehicle strikes, we used the previously documented data of vehicle strikes at PMRF (Figure 12). Within the last 5 years

(FY19-23), there has been between 3 to 13 vehicle strikes of nēnē per year. Due to the large range of strikes between years, we estimated both an average and maximum number of nēnē that could be impacted. In the last 5 years, there has been an average of 7.8 and a maximum of 13 nēnē struck by vehicles per year. Considering the increase in nēnē population at PMRF, despite the conservation measures being implemented, it is likely that the number of nēnē struck by vehicles per year may increase slightly. Therefore, it is anticipated that up to an average of 10 nēnē per year and a maximum of 15 nēnē in one year may be taken in the form of injury or mortality due to vehicle strikes.

To estimate the number of each Hawaiian waterbird species that could be injured or killed due to vehicle strikes, we again used previously documented data of vehicle strikes at PMRF (Figure 12). Compared to nēnē, vehicles strikes for Hawaiian waterbirds at PMRF has been much lower likely due to population sizes and the areas that these species use on base. Within the last 5 years (FY19-23), there has been 1 vehicle strike in FY21 for aeʻo; between 1 and 4 vehicle strikes per year for ʻalae ʻula; 1 vehicle strike in FY16, FY22, and FY23 for ʻalae keʻokeʻo; and 2 vehicle strikes in FY19 and 1 in FY22 for koloa maoli. Due to the small range of strikes between years and much lower number of strikes per year for Hawaiian waterbirds, we did not estimate an average number impacted per year as we did with nēnē. However, like nēnē, considering the projected population increases for these species at PMRF, despite the conservation measures being implemented, it is likely that the number of each Hawaiian waterbird species struck by vehicles per year may increase slightly. Therefore, it is anticipated that up to: 1 aeʻo per year, 5 ʻalae ʻula per year, 2 ʻalae keʻokeʻo per year, and 3 koloa maoli per year may be taken in the form of injury or mortality due to vehicle strikes.

<u>Effects Associated with Vegetation Maintenance</u>
Vegetation maintenance occurs throughout PMRF sites, but primarily at PMRF Barking Sands, Makaha Ridge, and Kōkeʻe. Vegetation maintenance includes mowing of grass areas, pruning of landscaping vegetation, grass-cutting and clearing, and tree trimming. These activities are anticipated to have impacts that do not rise to the level of adverse effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). However, tree trimming activities as proposed are expected to have adverse impacts on the ʻōpeʻapeʻa.

Vegetation maintenance activities such as operation of mowers, other mechanical tools, and grazing sheep have the potential to cause physical disturbance to nēnē and Hawaiian waterbirds, particularly those that are actively nesting. By incorporating conservation measures such as conducting nest surveys prior to vegetation maintenance and establishing a 100 ft buffer around active nests to avoid disturbance, adverse impacts to these species are highly unlikely to occur and are considered discountable. Therefore, it is expected that effects associated with vegetation maintenance may affect, but are not likely to adversely affect nēnē and all four Hawaiian waterbird species.

Tree trimming activities associated with vegetation maintenance are likely to have adverse effects on the ʻōpeʻapeʻa. ʻŌpeʻapeʻa roost in woody vegetation and will leave their young unattended in trees and shrubs when they forage. If trees or shrubs 15 ft or taller are cleared

during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or move away from disturbance. The majority of tree trimming activities at PMRF will occur outside of the pupping season. However, there are emergency situations where trimming of woody vegetation over 15 ft tall is determined necessary within the bat pupping season. In these situations, a PMRF biologist will conduct thermal imaging of trees to determine presence or absence of roosting sites. If a roost is not detected, tree trimming will commence. If a roost is detected, tree trimming will occur outside of a 100 ft buffer from any known roost. In emergency situations where trimming or removal of a tree with a known bat roost is determined necessary (e.g., for human life, health or safety), PMRF NR staff will coordinate with the Service prior to commencement of activities to report the situation. Considering the conservation measures above, emergency tree trimming activities, particularly in cases with detected roosts, are likely to be rare. It is expected that up to two ʻōpeʻapeʻa roosts may be taken in the form of injury or mortality for the 10-year term of this proposed action. Because the average number of pups produced each year is estimated to be 1.8, we define a roost as 1 adult ʻōpeʻapeʻa and 2 pups. Therefore, it is anticipated that up to 2 adult ʻōpeʻapeʻa and 4 pups in 10 years may be taken in the form of injury or mortality due to emergency tree trimming activities associated with vegetation maintenance.

Effects Associated with Construction Activities

Construction activities are anticipated to have impacts that do not rise to the level of adverse effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). The types of proposed construction activities include repairs, maintenance and upgrade projects, and replacement or reconstruction projects. The proposed future construction activities at PMRF are included in Table 3. These projects may involve use of heavy equipment that have the potential to cause physical disturbance to nēnē and Hawaiian waterbirds, particularly those that are actively nesting. By implementing conservation measures such as conducting nest surveys prior to construction activities and implementing a 100 ft buffer around active nests, adverse impacts to these species are highly unlikely to occur and are considered discountable. Therefore, it is expected that effects associated with construction activities may affect, but are not likely to adversely affect nēnē and all four Hawaiian waterbird species.

Effects Associated with Hazing for Bird Protection and Safety

Hazing for bird protection and safety is anticipated to have impacts that do not rise to the level of adverse effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). Hazing for bird protection and safety will be implemented in areas determined to be high risk for these species (e.g., along roadways and in situations of imminent danger). Hazing techniques utilized for this purpose will include on-foot harassment, horns/clapping, and inflatable air dancers (Table 4). For nēnē, most hazing will be conducted on non-brooding/molting adults in compliance with the nēnē 4(d) rule. However gravid females not actively nesting, families with mobile young, breeding pairs and molting adults may be hazed with the understanding that these individuals are vulnerable and will be hazed with extra care.

When hazed, nēnē and Hawaiian waterbirds are expected to be startled, distrubed, and temporarily abandon their normal behavior and the areas they currently occupy. Birds may be

stressed, miss provisioning their young, or leave the area. However, these disruptions to their normal behavior are not expected to result in physical injury or mortatilty and disruptions will be temporary. This type of hazing as proposed is not expected to reduce the fitness or survivorship of nēnē or Hawaiian waterbirds. Additionally, hazing for bird protection and safety will remove these species from areas of imminent danger or threats and reduce the overall risk of death or injury associated with the perceived threat (e.g., vehicle collision). Considering the hazing activities as proposed and their associated conservation measures, we do not expect the project to result in any meaningful disruption to their normal behaviors, nor any measurable reduction in reproductive success or reduced fitness. Therefore, effects to nēnē and all four Hawaiian waterbird species associated with hazing for bird protection and safety are expected to be insignificant.

Effects Associated with the PMRF Hunting Program

The PMRF hunting program is anticipated to have impacts that do not rise to the level of adverse effects on nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli). The hunting program includes three PMRF sites: Barking Sands, Makaha Ridge, and Kamokala caves. Hunting is limited to feral hogs, feral goats, and black tailed deer with the use of bow and arrow only; dogs and firearms are prohibited. Hunting activities have the potential to cause physical disturbance to nēnē and Hawaiian waterbirds if hunters approach a species too quickly or are unaware of their presence. By implementing conservation measures such as closing hunting areas with known listed species attractants during breeding seasons and briefing hunters on protocols/listed species, adverse impacts to these species are highly unlikely to occur and are considered discountable. Therefore, it is expected that effects associated with the PMRF hunting program may affect, but are not likely to adversely affect nēnē and all four Hawaiian waterbird species.

Effects Associated with the Predator Control Program

The predator control program at PMRF is beneficial for nēnē and all four Hawaiian waterbird species. The primary purpose of this program is to control feral cats and rodents that are threats to these listed species. Predator control will use both live traps (to target cats) and self-resetting A24 traps (to target rodents). While this activity is largely beneficial and critical to management of these species, there are potential adverse effects associated with the use of live traps on ʻalae ʻula and koloa maoli. Both species have been documented as incidentally trapped by live/cage traps throughout Hawaiʻi predator control programs in the past. Because of their nature (e.g., ʻalae ʻula tend to be secretive) and tendency to seek cover when disturbed, in rare cases these species have proven to enter traps by mistake. While nēnē have also been documented as incidentally captured in live traps, this predator control activity as proposed is considered authorized under the nēnē 4(d) rule.

Conservation measures for live trapping will include trap-free buffer areas around high-use areas for listed species, checking traps daily, and full or partial shade on traps to protect trapped animals from exposure. Despite the conservation measures being implemented, incidental captures resulting in injury or death to ʻalae ʻula and koloa maoli may occur.

To estimate the number of ʻalae ʻula and koloa maoli incidentally captured by live traps, we referenced the best available trapping data for non-target captures by a predator control program at Hanalei National Wildlife Refuge (NWR). From 2014 to 2018, Hanalei NWR recorded an average incidental trap rate (i.e., rate of incidental captures of ʻalae ʻula) of 0.004280 and average number of trap nights of 2,009.2. Based on these data, we estimated that up to 9 (8.6) birds would be incidentally captured per year at their site. The average number of ʻalae ʻula and koloa maoli surveyed at Hanalei NWR during that period was 384 and 401, respectively. The average number of ʻalae ʻula and koloa maoli surveyed at PMRF sites is closer to 10 individuals, respectively, or about 39 times less than Hanalei NWR. Therefore, we took 9 birds per year divided by 39 to account for population differences between sites to equal 0.23 birds per year incidentally captured at PMRF sites. Over the 10-year term of this BO, this would be 2.3 birds of each species (ʻalae ʻula and koloa maoli) incidentally captured by live traps. Therefore, it is anticipated that up to three ʻalae ʻula and three koloa maoli in 10 years may be taken in the form of injury or mortality due to incidental capture associated with predator control activities.

Effects Associated with Barbed Wire Fencing

Barbed wire fencing at all PMRF sites is expected to have adverse effects on the ʻōpeʻapeʻa. ʻŌpeʻapeʻa forage for insects from as low as 3 ft to higher than 500 ft above the ground and can become entangled in barbed wire used for fencing. When bats forage and consume invertebrates, their sonar is disrupted while they are masticating, making them more prone to colliding with obstacles when flying. So thin strands of barbed wire may be difficult for bats to detect.

The areas surrounding barbed wire fencing at PMRF sites vary from tall vegetation, various sized structures/buildings, and large swaths of open areas. Barbed wire fencing surrounded by large open areas are particularly high risk for entanglement due to the lack of other structures/objects that bats could detect and avoid in the immediate vicinity of barbed wire. The total length of barbed wire fencing throughout all six PMRF sites includes 8.2 mi of 3-strand barbed wire fence, and 0.7 mi of 6-strand barbed wire fence. While there is no data available for density of ʻōpeʻapeʻa at PMRF sites, acoustical surveys have detected use of these sites by ʻōpeʻapeʻa throughout the year.

Considering the areas surrounding barbed wire fencing, the significant length of barbed wire fencing, and the presence of ʻōpeʻapeʻa at PMRF sites, adverse effects to ʻōpeʻapeʻa as a result of entanglement with barbed wire are likely to occur. To estimate the number of ʻōpeʻapeʻa that may become entangled with barbed wire, we used a formula derived by USGS studies. The formula estimates that 0.013 bats may be harmed per mile of each barbed wire strand per year. This estimate is derived from data gathered from known bat fatalities on barbed wire fencing. While this formula is based on a limited data set, it is the best data available to estimate the risk caused by barbed wire fencing. By using this formula, we multiplied 0.013 bats by 28.8 miles (total length of barbed wire strands) by 10 years (term of the proposed action) to equal 3.744 bats. Therefore, it is anticipated that up to 4 ʻōpeʻapeʻa in 10 years may be taken in the form of injury or mortality due to entanglement associated with barbed wire fencing.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any future state, tribal, local, or private actions that are reasonably certain to occur within the action area at this time; therefore, no cumulative effects are anticipated.

Conclusion

After reviewing the status of nēnē, aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, koloa maoli, and ʻōpeʻapeʻa, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the base infrastructure operations and maintenance at PMRF, as proposed, is not likely to jeopardize the continued existence of these species. No critical habitat has been designated for these species; therefore, none will be affected.

Adverse effects from the proposed action are anticipated to have low impacts on the nēnē reproduction and population. In total, up to an average of 6 nēnē nests per year may be injured or result in mortality due to nest failure/abandonment or nest destruction. While this impact may occur annually for the 10 year term of this action, this impact represents a slight reduction in reproductive effort and reproductive success at PMRF annually and is not expected to have population or species level impacts. The total take of nēnē individuals that may be injured or killed is up to an average of 14 nēnē individuals per year. This take represents approximately 0.4 percent of the total population (3,545) of nēnē and about 0.6 percent of the population of nēnē on Kauaʻi (2,199). While this take may occur annually, it is not expected to appreciably reduce the overall long-term total population of nēnē. Beneficial effects from implementing predator control should also mitigate some of these effects. Additionally, conservation measures are anticipated to avoid and minimize adverse effects, such as various traffic calming measures to reduce vehicle collisions, vegetation maintenance to decrease attractiveness of sites to nēnē, and hazing in areas to reduce the risk of injury or death to nēnē from hazards (e.g., BASH, roads/vehicles, etc.). Therefore, the overall effects from the proposed action on nēnē is not expected to appreciably reduce their long-term population and have population or species level impacts.

Adverse effects from the proposed action are anticipated to have low impacts on the aeʻo population. Up to 2 aeʻo individuals per year may be injured or killed, which is minimal compared to the overall estimated population of aeʻo statewide (1,400 to 2,200). Beneficial effects from implementing predator control should also mitigate some of these adverse effects. Therefore, the overall effects from the proposed action on aeʻo is not expected to appreciably reduce their long-term population and have population or species level impacts.

Adverse effects from the proposed action are anticipated to have low impacts on the ʻalae ʻula population. Up to 6 ʻalae ʻula individuals per year and an additional 3 individuals within the 10

year term of this action may be injured or killed, which is minimal compared to the overall population of ʻalae ʻula statewide (927) and on the island of Kauaʻi (596). Beneficial effects from implementing predator control should also mitigate some of these adverse effects. Therefore, the overall effects from the proposed action on ʻalae ʻula is not expected to appreciably reduce their long-term population and have population or species level impacts.

Adverse effects from the proposed action are anticipated to have low impacts on the ʻalae keʻokeʻo reproduction and population. Up to 1 ʻalae keʻokeʻo nest may be injured or result in mortality due to nest failure or abandonment, which represents a slight reduction in reproductive effort and reproductive success at PMRF. Up to 3 ʻalae keʻokeʻo individuals per year may be injured or killed, which is minimal compared to the overall population estimate of ʻalae keʻokeʻo statewide (1,815). Beneficial effects from implementing predator control should also mitigate some of these adverse effects. Therefore, the overall effects from the proposed action on ʻalae keʻokeʻo is not expected to appreciably reduce their long-term population and have population or species level impacts.

Adverse effects from the proposed action are anticipated to have low impacts on the koloa maoli reproduction and population. Up to 1 koloa maoli nest may be injured or result in mortality due to nest failure or abandonment, which represents a slight reduction in reproductive effort and reproductive success at PMRF. Up to 4 koloa maoli individuals per year and an additional 3 individuals within the 10-year term of this action may be injured or killed, which is minimal compared to the overall population estimate of koloa maoli on the island of Kauaʻi (947). Beneficial effects from implementing predator control should also mitigate some of these adverse effects. Therefore, the overall effects from the proposed action on koloa maoli is not expected to appreciably reduce their long-term population and have population or species level impacts.

Adverse effects from the proposed action are anticipated to have low impacts on the ʻōpeʻapeʻa population. Up to 10 individuals over the 10-year term of this action may be injured or killed. While ʻōpeʻapeʻa have been detected to use areas around PMRF sites, there is currently no data to show the total population of ʻōpeʻapeʻa in the action area. Conservation measures include tree trimming primarily occurring outside the pupping season, using thermal imaging to detect bats for emergency tree trimming, and visual surveys of barbed wire fences. While population trends have not been established for the island of Kauaʻi, the ʻōpeʻapeʻa population on the island of Hawaiʻi is considered to be stable to increasing. Therefore, the anticipated take of 10 individuals that may occur over the 10-year term of this action is not expected to cause downward trends in overall population and have species level impacts.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to

engage in any such conduct. Harm is further defined by FWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by FWS as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is following the terms and conditions of this incidental take statement.

The measures described below are non-discretionary and must be undertaken by the Navy so that they become binding conditions of any grant or permit issued by the Navy, as appropriate, for the exemption in section 7(o)(2) to apply. The Navy has a continuing duty to regulate the activity covered by this incidental take statement. If the Navy (1) fails to assume and implement the terms and conditions or (2) fails to require any applicant (e.g., contractor) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Navy must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or Extent of Take Anticipated

The Service anticipates the following incidental take may occur over the 10-year term of this proposed action:

Hawaiian Goose or Nēnē

- Up to four (4) nēnē individuals per year may be taken in the form of injury or mortality due to aircraft strikes associated with air operations.
- Up to an average of three (3) nēnē nests per year and a maximum of seven (7) nēnē nests in one year may be taken in the form of mortality due to nest destruction within the nēnē nest removal zone.
- Up to one (1) nēnē nest per year may be taken in the form of mortality due to nest destruction near launch pads.
- Up to one (1) nēnē nest per year may be taken in the form of injury or mortality due to nest failure or abandonment because of disturbance associated with launch or live fire activities near launch pads.
- Up to one (1) nēnē nest may be taken in the form of injury or mortality due to nest failure or abandonment because of disturbance associated with the Oxidation Pond re-lining project.
- Up to an average of ten (10) nēnē individuals per year and a maximum of fifteen (15) nēnē individuals in one year may be taken in the form of injury or mortality due to

vehicle strikes.

Hawaiian Stilt or Ae‘o

- Up to one (1) ae‘o individual per year may be taken in the form of injury or mortality due to aircraft strikes associated with air operations.
- Up to one (1) ae‘o individual per year may be taken in the form of injury or mortality due to vehicle strikes.

Hawaiian Gallinule or ‘Alae ‘ula

- Up to one (1) ‘alae ‘ula individual per year may be taken in the form of injury or mortality due to aircraft strikes associated with air operations.
- Up to five (5) ‘alae ‘ula individuals per year may be taken in the form of injury or mortality due to vehicle strikes.
- Up to three (3) ‘alae ‘ula individuals may be taken in the form of injury or mortality due to incidental capture associated with predator control activities.

Hawaiian Coot or ‘Alae Ke‘oke‘o

- Up to one (1) ‘alae ke‘oke‘o individual per year may be taken in the form of injury or mortality due to aircraft strikes associated with air operations.
- Up to one (1) ‘alae ke‘oke‘o nest may be taken in the form of injury or mortality due to nest failure or abandonment because of disturbance associated with the Oxidation Pond re-lining project.
- Up to two (2) ‘alae ke‘oke‘o individuals per year may be taken in the form of injury or mortality due to vehicle strikes.

Hawaiian Duck or Koloa Maoli

- Up to one (1) koloa maoli individual per year may be taken in the form of injury or mortality due to aircraft strikes associated with air operations.
- Up to one (1) koloa maoli nest may be taken in the form of injury or mortality due to nest failure or abandonment because of disturbance associated with the Oxidation Pond re-lining project.
- Up to three (3) koloa maoli individuals per year may be taken in the form of injury or mortality due to vehicle strikes.
- Up to three (3) koloa maoli individuals may be taken in the form of injury or mortality due to incidental capture associated with predator control activities.

Hawaiian Hoary Bat or ‘Ōpe‘ape‘a

- Up to two (2) adult ‘ōpe‘ape‘a and four (4) pups may be taken in the form of injury or mortality due to emergency tree trimming activities associated with vegetation maintenance.
- Up to four (4) ‘ōpe‘ape‘a individuals may be taken in the form of injury or mortality due to entanglement associated with barbed wire fencing.

Effect of Take

In this biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy of the nēnē, aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, koloa maoli, and ʻōpeʻapeʻa.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of nēnē, aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, koloa maoli, and ʻōpeʻapeʻa:

1. The Navy will minimize the potential for death and injury of nēnē and all four Hawaiian waterbird species (aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, and koloa maoli) due to aircraft strikes and vehicle strikes.

2. The Navy will minimize the potential for death and injury of ʻalae ʻula and koloa maoli due to incidental capture associated with predator control. Implementation of predator control will provide an overall benefit to nēnē and all four Hawaiian waterbird species.

3. The Navy will minimize the potential for death and injury of nēnē, ʻalae keʻokeʻo, and koloa maoli due to nest destruction (for nēnē only) or nest failure/abandonment associated with nest removal (for nēnē only) or disturbance from project activities (e.g., activities near launch pads and Oxidation Pond re-lining project).

4. The Navy will minimize the potential for death and injury of ʻōpeʻapeʻa due to emergency tree trimming activities and entanglement with barbed wire fencing.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Navy must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary. The following terms and conditions apply to all reasonable and prudent measures (#1-4) above:

- The Navy will notify the Service by email or telephone within 24 hours upon the discovery of an injured or dead nēnē, aeʻo, ʻalae ʻula, ʻalae keʻokeʻo, koloa maoli, or ʻōpeʻapeʻa. The Navy will provide the Service a written notification, summarizing the event, within 30 days. Written notification will include details such as date/time of discovery, relevant species information (e.g., age, if banded bird), location, probable cause of injury or death with supporting evidence, condition of specimen, and any action(s) taken.

- The Navy will notify the Service by email or telephone within 24 hours upon the discovery of an abandoned or failed nēnē, ʻalae keʻokeʻo, or koloa maoli nest. The Navy will provide the Service a written notification, summarizing the event, within 30 days.

Written notification will include details such as the date/time of discovery, nest details (e.g., number of eggs, age/lay date, etc.), location, probable cause of abandonment or failure with supporting evidence, condition of the nest/eggs, and any action(s) taken.

- The Navy will notify the Service by email or telephone within 24 hours upon the discovery of a nēnē nest that is considered for removal (i.e., nest destruction) within the NNRZ or near launch pads. If nest removal is carried out, the Navy will provide the Service a written after-action report, summarizing the event, within 30 days. The after-action report will include details such as date/time of nest discovery, nest details (e.g., number of eggs, age/lay date, etc.), location, efforts to prevent nesting in the area (i.e., hazing, monitoring, vegetation maintenance), and details of the action/nest removal.

- The Navy will notify the Service by email or telephone within 24 hours upon determining emergency trimming or removal of a tree with a known ʻōpeʻapeʻa roost may be necessary. This notification will occur prior to commencement of tree trimming or removal activities. If trimming or removal of a tree with a known ʻōpeʻapeʻa roost is carried out, the Navy will provide the Service a written after-action report, summarizing the event, within 30 days. The after-action report will include details such as date/time of action, location, reason for emergency, details of roost, protocols followed, details of the action(s), and impacts to roost observed.

- The Navy will submit annual reports detailing the implementation of the above conservation measures used to minimize impacts for the effects of the action. Annual reports will also summarize survey and monitoring results, hazing efforts, and levels of take or potential take of all listed species (summary of written notifications and after-action reports above). Annual reports will be submitted to the Service by February 1 following the end of each fiscal year. If an extension is needed, the Navy will notify the Service to coordinate.

- Should take of listed species occur and the carcass recovered, the Service may request that the carcass be subjected to necropsy. Otherwise, the depository designated to receive specimens that are found is the B.P. Bishop Museum, 1525 Bernice Street, Honolulu, Hawaiʻi, 96817 (telephone: 808/847-3511). If the B.P. Bishop Museum does not wish to accession the specimens, contact the Service's Division of Law Enforcement in Honolulu, Hawaiʻi (telephone: 808/861-8525; fax: 808/861-8515) for instructions on disposition.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

The Service recommends the Navy undertake the following conservation recommendations:

- The Navy should consider coordinating with the Service and other partners to explore potential opportunities for relocating nēnē from PMRF to other locations. This would reduce the population of nēnē at PMRF that may be impacted by the proposed action.

- The Navy should continue efforts to assess and implement traffic calming measures to further reduce the risk of vehicle strikes to nēnē and Hawaiian waterbirds.

- The Navy should support efforts and contribute funds to projects that support the recovery and conservation of nēnē and Hawaiian waterbirds and their habitats off installation.

- The Navy should support efforts and contribute funds to ʻōpeʻapeʻa research aimed at increasing our understanding of migration and resource use on the island of Kauaʻi. With limited information currently available, this type of research will increase our understanding of this species and allow us to make informed management decisions to benefit ʻōpeʻapeʻa on the island of Kauaʻi.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

Reinitiation-Closing Statement

This concludes formal consultation on the actions outlined in this biological opinion. As provided in 50 CFR § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and: (1) if the amount or extent of taking specified in the incidental take statement is exceeded; (2) if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) if a new species is listed or critical habitat designated that may be affected by the identified action.

We appreciate your cooperation and assistance in helping us prepare this biological opinion. If you have any questions about this consultation, please contact Ryan Peʻa, Fish and Wildlife Biologist, at (808) 792-9400 or by email at ryan_pea@fws.gov. When referring to this project, please include this reference number: 2024-0133752-S7.

Sincerely,

AARON NADIG Digitally signed by AARON NADIG Date: 2025.01.15 15:22:16 -10'00'

Deputy Field Supervisor
Programmatic Operations

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APPENDIX A. Nene and Hawaiian Waterbird Hazing Protocols at PMRF Sites, 2024

Nene & Hawaiian Waterbird Hazing Protocols

Pacific Missile Range Facility (PMRF), Kauai, Hawaii

April 2024

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1. INTRODUCTION

1.1 Purpose

This protocol formalizes procedures for hazing nene and Hawaiian waterbirds – the Hawaiian duck, Hawaiian stilt, Hawaiian coot and Hawaiian gallinule at PMRF Main Base (hereafter referred to as Barking Sands) and associated sites. At Barking Sands there is Bird/Animal Aircraft Strike Hazard (BASH) hazing to protect human safety and reduce flight collisions with animals. At Barking Sands and associated PMRF sites there is also hazing to protect the military mission (i.e. launch sites, live fire training, etc.). At all PMRF sites with nene and/or Hawaiian waterbird presence there is hazing to protect birds from hazards related to operations and activities at PMRF sites. Hazards include strikes by vehicles, strikes by golf balls, injury or mortality due to vegetation maintenance or construction activities, injury or mortality due to launch activities and sickness or mortality due to botulism.

BASH hazing is conducted basewide year-round for nene, with an emphasis before and during the breeding season to non-nesting adults. Basewide hazing is conducted to discourage nene from habituating and nesting at Barking Sands, which can result in an increase of nene families utilizing PMRF and becoming a risk to mission or a BASH hazard to aviation. Hazing to breeding pairs is also conducted within the *proposed* 8,000 ft. buffer zone around the airfield, which extends south to Tartar Drive. Within this 8,000 ft. buffer zone breeding nene pairs are targeted for hazing to reduce successful nesting attempts within the current authorized NNRZ and the *proposed* ~~5,000~~ 200 ft. around launch pads Nene Nest Removal Zone (NNRZ).

Hazing may be conducted to breeding pairs and nene families for their protection anywhere on Barking Sands, Makaha Ridge or Kokee sites if they are in imminent danger (i.e. near roadsides, in close proximity to vegetation maintenance equipment, in close proximity to construction equipment). Nene may also be hazed within 500' from a launch pad or training site to deter nene from habituating near areas that may result in injury or mortality.

This protocol outlines personnel involved in hazing ESA-listed nene and Hawaiian waterbirds as well as the training requirements that must be met to haze. It integrates PMRF Air Operations BASH Program objectives with the PMRF Natural Resources Program objectives. Both programs are required to follow federal regulations that meet standards for safe air operations and for the protection of threatened and endangered species. These protocols *will* comply with the incidental take statement, terms and conditions as well as reasonable and prudent measures outlined in the Biological Opinion issued by the U.S. Fish and Wildlife Service (USFWS) to PMRF.

1.2 Location and Setting

The protocol applies to all PMRF sites where nene and/or Hawaiian waterbirds may occur. PMRF sites with known nene presence include, Barking Sands (2,060 acres), Makaha Ridge (209 acres) and Kokee Sites (19 acres). PMRF sites with known Hawaiian waterbird presence include Barking Sands. The majority of hazing activities will occur on Barking Sands due to the population numbers of nene and Hawaiian waterbirds coupled with the activities that take place on Barking Sands – airfield operations, range operations, launch activities, vehicular driving, vegetation maintenance, construction activities, etc. Hazing operations shall only occur within the borders of PMRF sites, including leased land, as deemed necessary for human and bird safety and protection.

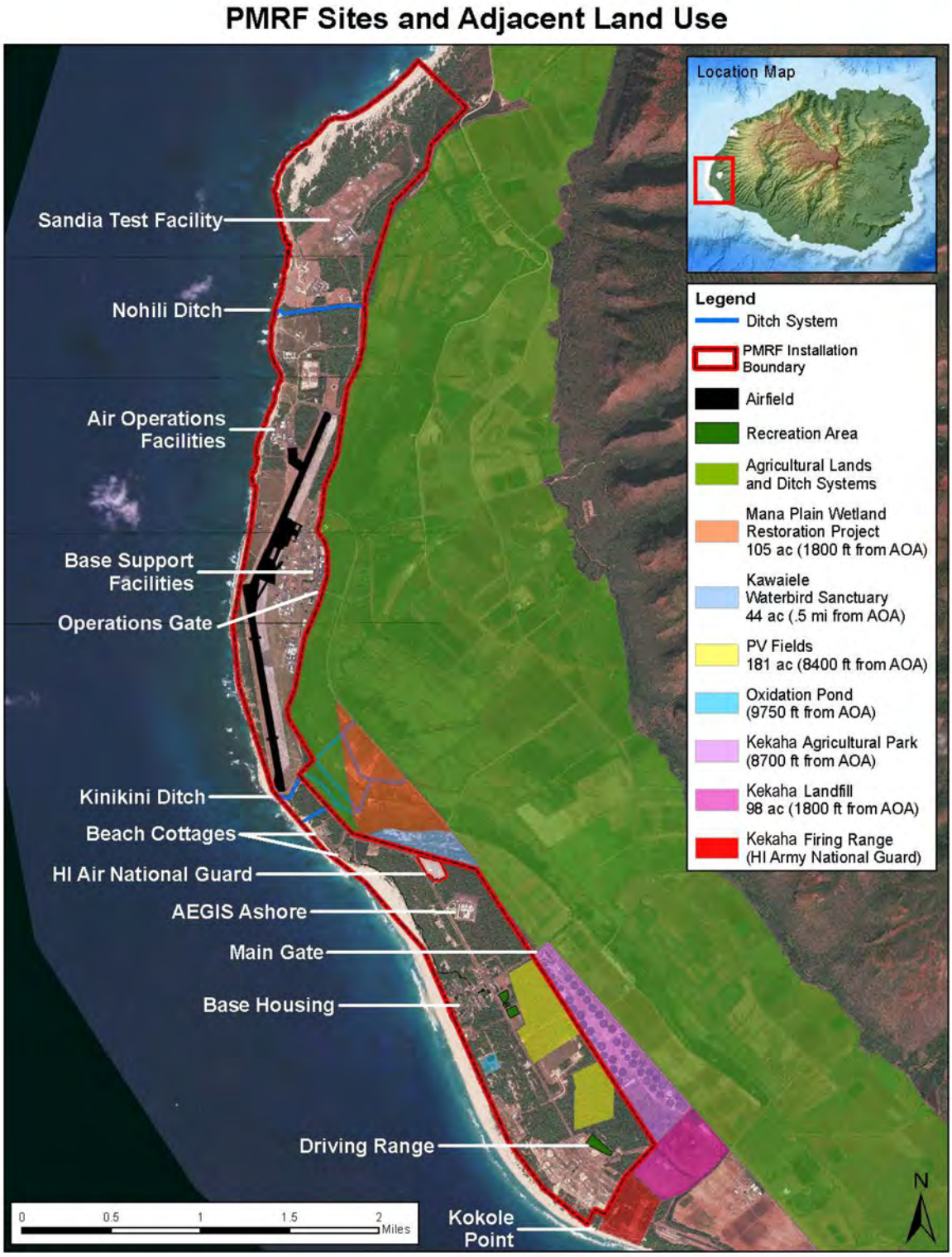

Figure 1. Map of PMRF Barking Sands and Adjacent Land Use.

2. NENE & HAWAIIAN WATERBIRD LISTING STATUS & BIOLOGY

ESA-Listed nene and Hawaiian waterbirds have different breeding seasons, including year round nesting by the Hawaiian duck, Hawaiian coot and Hawaiian gallinule. The primary method used to monitor abundance of these species and other wetland birds is the biannual state-wide waterbird count administered by the Hawaii Division of Forestry and Wildlife (DOFAW). The survey is conducted twice a year, in winter and summer, and covers most of the wetlands known to support waterbirds on each island, except Niihau. Additional surveys are conducted monthly by USFWS staff at each national wildlife refuge across the state of Hawaii.

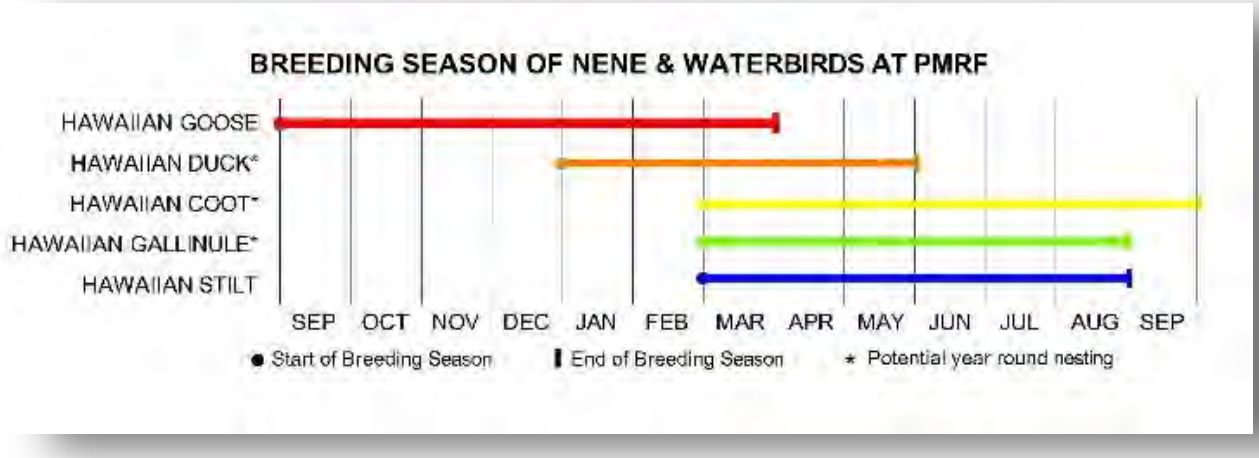

Figure 2. Breeding Seasons of Nene and Hawaiian Waterbirds

2.1 Hawaiian Goose (*Nene*)

Listing Status: Federally listed as threatened. On January 21, 2020 the Hawaiian Goose (nene) was reclassified under the US Fish and Wildlife Service's Endangered Species Act (ESA) from endangered to threatened, along with issuance of a Section 4(d) Rule. This rule allows for more flexibility in management and removes prohibitions on take for actions not anticipated to cause direct injury or mortality.

Population Size and Trends: In 1951, the wild nene population was estimated at 30 individuals. By 2014 the population was estimated at 2,450 birds (DLNR 2015). The 2017 statewide nene survey by DLNR DOFAW recorded 1,482 individuals on Kauai, which accounted for nearly half of the statewide counts, totaling 3,252 individuals; by 2019 Kauai was estimated to have 1,891 individuals. Populations on Kauai have been observed to be stable and increasing, although populations on the West-side of the island can be variable.

Breeding Season**:** The nene breeding season at PMRF generally spans from September – March, with increased nest building and clutches laid during October - December. However, goslings have been spotted as early as August at PMRF Barking Sands. Nests are shallow with moderately lined plant materials and down, usually hidden in dense vegetation. Non-native vegetation utilized for nesting include: Christmas berry (*Schinus terebinthifolius*), shrub verbena (*Lantana camara*), and ironwood (*Casuarina* spp.) (DLNR 2015). Females lay between one to five eggs, with an average clutch size of 3.5 on Kauai. Incubation takes around 30 days. Goslings fledge about 70-84 days after hatching. Goslings

typically stay with their family until the next breeding season or until they are able to breed at 2 years of age (Kauai Nene HCP, 2017).

Signs of breeding include courtship displays by males, in which they attack or threaten potential competitors, run back to their mate, and call loudly (DLNR 2015). If nene are hazed from a particular area and return back almost immediately, they may be scouting a potential nest site. Pairs typically mate for life, return to their previous years' nest site and live approximately 20 years.

Diet: Nene graze and browse on the leaves, seeds, flowers, and fruits of at least 50 native and nonnative grasses, sedges, composites, and shrubs. Diet varies by location and habitat, and they may require a diverse suite of food plants (DLNR 2015). At PMRF nene are observed grazing on seeding grass and newly emergent grasses, which is problematic when near roadsides, on or near the airfield, launch facilities and sources of Electromagnetic fields (EMF). They have also been observed foraging and loafing near pig divots.

2.2 Hawaiian Duck (*Koloa maoli*)

Listing Status: Federally listed as endangered.

Population Size and Trends: The Hawaiian duck population is estimated at 2,200 individuals, with 90 percent of individuals occurring on Kauai (DLNR 2015). The total population appears to be increasing due primarily to population increases on Kauai, but numbers are declining on other islands due to hybridization (Vanderwerf 2012). DLNR DOFAW conducts biannual state-wide counts of Hawaiian waterbirds, but due to hybridization and varied habitats, it is difficult to accurately measure population numbers. Hawaiian ducks occur in a variety of wetland habitats from sea level to 6,900 feet elevation.

Breeding Season: The Koloa is a small brownish duck, in which both sexes are similar in appearance to a female Mallard. Adult males and females are mottled brown overall. Males have darker heads and necks, olive bills and bright orange feet. The bills of females are more orange, their feet are dull orange, and they are smaller than males (DLNR 2015). Nesting occurs year-round, but most breeding activity occurs between January through May. Nests are usually on the ground in dense vegetation, near water. Clutch size ranges from two to ten eggs, with an approximately 30 day incubation period, and chicks hatching in April-June (VanderWerf 2012).

Diet: Koloa are opportunistic feeders and their diet includes snails, dragonfly larvae, earthworms, small fish, grass seeds, green algae, and seeds/leaf parts of wetland plants. They are usually found alone or in pairs and are guarded, especially when nesting or molting, although during the winter they may gather in larger numbers to exploit abundant food resources. Koloa typically forage in shallow water, less than 5 inches deep (DLNR, 2015).

2.3 Hawaiian Stilt (*Ae'o*)

Listing Status: Federally listed as endangered. USFWS is proposing to reclassify the Hawaiian stilt from endangered to threatened in 2021.

Population Size and Trends: Based on the biannual Hawaiian waterbird counts from 1998-2007, the Hawaiian stilt population averaged 1,484 birds, but fluctuated between approximately 1,100 and 2,100 birds. The population trend has been increasing over the past 30 years. (USFWS 2011). On Kauai, stilts are found in large rivers, on the Mana Plains, as well as reservoirs and former sugarcane settling ponds. Hawaiian Stilts move seasonally between Kauai and Niihau in response to water level changes in Niihau's

ephemeral lakes. (DLNR 2015). On PMRF Main Base, Hawaiian stilts are seen throughout the ditch systems.

Breeding Season: Adults are mostly black above and white below with a long, thin black bill and long, delicate pink legs. Females are more brownish on the back than males, and immatures have more white on the face and sides of the neck. Nesting occurs between March and August and peaks in May and June. Generally, three to four eggs are laid, and the precocial chicks hatch approximately 24 days later. Both parents incubate eggs and brood young, and fledglings remain with their parents for several months. (DLNR 2015). Nesting occurs on freshly exposed mudflats with some low-growing vegetation; individuals will also nest on islands in freshwater and brackish water ponds or artificial floating nest structures. They aggressively defend their nests, calling and diving at intruders and performing broken-wing displays to attract potential predators away from their nests. (DLNR 2015).

Diet: Foraging habitat consists of ephemeral freshwater, brackish water, or saltwater habitats. Hawaiian Stilts favor shallower water for foraging (<9 in.) and are more tolerant of higher salinity. They are opportunistic and prey on a variety of animals that inhabit shallow water or mudflats, including bristle worms, small crabs, insects, and small fish. Water depth, salinity levels and vegetation density are important determinants of foraging habitat suitability. (DLNR 2015).

2.4 Hawaiian Coot (*'Alae ke'oke'o*)

Listing Status: Federally listed as endangered.

Population Size and Trends: The Hawaiian coot occurs in coastal plain wetlands on all the Main Hawaiian Islands except for Kahoolawe; with about 80 percent of the population on Kauai (DLNR 2015). The average number of Hawaiian Coots observed during DLNR DOFAW's biannual statewide waterbird count has averaged about 2,000 from 1997-2006, but numbers have fluctuated between 1,500 and 2,800. The population trend has been increasing from 1981 to 2011. (USFWS 2011). On Kauai, coots are found at many locations, but the largest concentrations are at Hanalei National Wildlife Refuge (NWR), the Kauai Lagoons golf course, and fragmented wetlands on the Mānā Plain. Coots may move seasonally between Kauai and Niihau in response to water level changes in Niihau's ephemeral lakes, with over 900 birds counted on Niihau in particularly wet years. Hawaiian coots often use more open wetlands with deeper water. (USFWS 2011).

Breeding Season: Adult males and females have a black head, a slate gray body with white undertail feathers, and a prominent white frontal shield and bill; feet are lobed rather than webbed and are greenish gray. (DLNR 2015). The nesting season is primarily March – September, but varies depending on water levels, however nests can be found year-round. Nest initiation is tied to rainfall because appropriate water levels are critical to nest success. Clutch size range from three to ten eggs, and precocial young hatch after a 25-day incubation period (DLNR 2015). The nest is a platform built of aquatic vegetation and may be floating in open water, anchored to emergent vegetation, or in clumps of vegetation on the shoreline. Small islands may be preferred if available (USFWS 2011).

Diet: Hawaiian coots are generalist feeders that forage on the water surface, forage by diving down to pick at mud or sand and forage by grazing on upland grassy sites near wetlands. Foods eaten include algae, leaves and seeds, various invertebrates including snails, crustaceans, insects, larvae, tadpoles, and small fish. They prefer freshwater but are often found in brackish wetlands. They usually forage in water less than 12 in. deep, but can dive below the surface up to about 48 in. (USFWS 2011).

2.5 Hawaiian Gallinule (*'Alae 'ula*)

Listing Status: Federally listed as endangered.

Population Size and Trends: Hawaiian gallinules are currently found only on the islands of Kauai and Oahu, with each island supporting roughly half the total population, but historically Hawaiian gallinules occurred on all the main Hawaii Islands except Lanai and Kahoolawe (USFWS 2011). An average of 287 Hawaiian Gallinules were observed during the biannual state-wide waterbird count from 1998-2007 but numbers have fluctuated between about 100 and 450 (USFWS 2011). However, these numbers are not accurate and are best viewed as an index; the actual population size probably is higher, but it is difficult to estimate because of the species secretive habits and preference for densely vegetated wetlands. The population trend is thought to be increasing or stable (USFWS 2011). On Kauai, the largest populations occur in the Hanalei and Wailua river valleys, and in irrigation canals on the Mana Plains (VanderWerf, 2012). Key habitat features include dense stands of emergent vegetation along shorelines or in open water, floating or barely emergent mats of vegetation, and water depths less than 3 feet (DLNR 2015).

Breeding Season: The species' life history and breeding biology are poorly known. Adults are black above and dark slate blue below, with a white stripe on their flanks and a prominent red shield over their red and yellow bill. Feet are lobed rather than webbed, and males are larger than females (DLNR 2015).
The nesting season is primarily March – September, but varies depending on water levels and presence of dense vegetation, with nests found in all months. Platform nests are constructed in dense vegetation over water less than 24 in. deep. Five to six eggs are laid and hatch after 22 days. Although chicks are precocial and can swim shortly after hatching, they are dependent on their parents for several weeks. (DLNR 2015). Hawaiian gallinules cannot fly for about 25 days each year when they are molting, usually from June-September, increasing their vulnerability to predation (DesRochers et al. 2009).

Diet: Gallinules use a variety of freshwater habitats and can be somewhat secretive, foraging in dense emergent or floating vegetation. They are opportunistic feeders, and their diet likely varies with habitat, but includes algae, grass seeds, plant material, insects, larvae and snails. (DLNR 2015).

3. BASH HAZING & NEST REMOVAL OPERATIONS & PROCEDURES

3.1 Training & Personnel Involved

Personnel involved in hazing ESA-listed species for BASH purposes will be required to take a training course conducted by the PMRF USDA-WS personnel. All installation personnel involved in direct control measures within the airfield environment will complete a training syllabus in accordance with CNICINST 3750.1 (series) and be designated, in writing, by the Air Operations Officer, who is also the BASH Program Manager. In addition to the WDDT, PMRF personnel that have been deemed necessary by the BASH Program Manager to assist with BASH hazing and have completed the above training, will assist with hazing activities on PMRF Barking Sands. The USDA-WS wildlife biologist is responsible for maintaining a record of trained individuals.

U.S. Dept. of Agriculture, Animal Plant Health Inspection Services – Wildlife Services (USDA-WS):

The current interagency agreement between CNIC and USDA-WS funds a full-time wildlife biologist and a full-time wildlife technician for BASH support at PMRF. The USDA-WS Work/Financial Plan requires USDA-WS to train PMRF personnel who are involved with BASH hazing. USDA-WS is authorized to haze brooding/molting adults, and goslings within the *proposed* 8,000 ft. AOA buffer. USDA is authorized to remove nene nests/eggs within the current authorized NNRZ and *proposed* 200 ft. around launch pads NNRZ buffer, in coordination with the PMRF NRM.

Wildlife Detection and Dispersal Team (WDDT):

The WDDT identifies wildlife and wildlife attractants, assesses wildlife hazards, determines BASH conditions, reports wildlife observations, wildlife hazards, BASH conditions, and disperses wildlife to mitigate hazards. The WDDT is also responsible for rapid response to deal with emergent BASH issues impacting flight operations at the PMRF airfield. The WDDT is authorized to haze non-brooding/molting nene basewide. PMRF's WDDT personnel include but are not limited to: USDA personnel and airfield operations personnel. The Natural Resources Manager is part of the BASH Working Group, but not part of the WDDT.

Other PMRF Personnel, Tenants and Contractors:

Additional PMRF personnel, tenants and contractors may be required to assist with BASH hazing efforts when the airfield is closed for sporadic weekend, evening, and holiday support. Pending training by the USDA-WS personnel, and designation by the BASH program manager, trained PMRF personnel will be able to assist with BASH hazing basewide to help prevent nene nesting within the NNRZ.

3.2 Hazing & Nest Removal Techniques for Nene and Hawaiian Waterbirds

Thirty BASH hazing techniques and 9 protocols are utilized at PMRF. The most effective BASH hazing techniques used at Barking Sands to deter nene are vehicle harassment, and vehicle herding. PMRF plans to utilize a hazing dog primarily for launch and live fire activities, however, the dog will be utilized to assist the BASH program when priorities allow. Higher hazing numbers are generally recorded in the months leading up to the nene breeding season, with the nene breeding season spanning September – April. Table 1 below lists the specific BASH hazing actions, as well as the areas they will occur.

In the immediate vicinity of the airfield, USDA-WS and the WDDT may utilize pyrotechnics (e.g. modified pistols, 12 gauge shotguns, bangers), noise making devices (e.g. ultrasonic repellers, horns, sirens, propane cannons), static deterrents (e.g. effigies, mylar tape), active hazing (vehicle harassment and on-

foot harassment), a bird deterrent laser to reduce bird presence near the airfield, and other bird deterrent measures as authorized under the 4(d) Rule.

Within 8,000 ft. from the airfield, USDA-WS, the WDDT and other authorized PMRF personnel, tenants and contractors may utilize vehicle harassment, and on-foot harassment to harass nene that are attempting to breed. Additional deterrents that may be used within the 8,000 ft. boundary by USDA-WS include: flags, mylar tape, predator effigies, decoys, air dancers, and balloons. Noise making devices may also be used within the 8,000 ft. boundary to deter nene from foraging and nesting near the airfield.

Basewide BASH hazing of nene, under parameters of the 4(d) rule, may be conducted by USDA-WS, the WDDT and other authorized PMRF personnel, tenants and contractors. Basewide 4(d) compliant hazing may utilize noise making devices (e.g. 12 gauge cracker shells, bangers, whistles, screamers, recording barks), herding by vehicles, vehicle harassment, on-foot harassment, and harassment by tethered or trained dogs. Access control, predator effigies and non-toxic chemical bird repellents may be utilized to discourage foraging and nesting. Hazing that occurs outside the 8,000 buffer zone will not be conducted to brooding/molting adults, families or goslings. Basewide hazing will focus on hazing outside of the nene breeding season, with the breeding season spanning from September – April. Hazing may occur during the nene breeding season after a qualified biologist1 has surveyed the area and confirmed that there are no nests, or goslings present within 100 ft. Brooding2 adults or adults in molt3 are not allowed to be hazed at any time under the 4(d) rule.

Table 1. BASH Hazing Techniques for Nene and Hawaiian Waterbirds

Hazing Techniques for BASH	Type	Personnel Authorized	ESA-Listed Species Used on	Location
Modified Pistols	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
12 gauge shotgun	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
Bangers/Whistles/Screamers	Pyrotechnics	USDA-WS	Waterbirds	Airfield/750 ft.
Vehicle Harassment	Active Hazing	USDA-WS	Waterbirds	Airfield/750 ft.
On-foot Harassment	Active Hazing	USDA-WS, WDDT	Waterbirds	Airfield/750 ft.
Sirens/Horns/Clapping	Noise Making	USDA-WS, WDDT	Nene & Waterbirds	Airfield/750 ft.
Ultrasonic Repellers	Noise Making	USDA-WS	Nene*	Airfield AOA
Propane Cannons	Static Deterrent	USDA-WS	Nene*	Airfield AOA
Vehicle harassment	Active Hazing	USDA-WS	Nene***	Airfield/8,000 ft.
On-foot Harassment	Active Hazing	USDA-WS, WDDT	Nene*	Airfield/8,000 ft.
Sirens/Horns/Clapping	Noise Making	USDA-WS, WDDT	Nene*	Airfield/8,000 ft.
Flags	Static Deterrent	USDA-WS	Nene & Waterbirds	Airfield/8,000 ft.
Mylar tape	Static Deterrent	USDA-WS	Nene & Waterbirds	Airfield/8,000 ft.
Scarecrow/Effigies/Decoy	Static Deterrent	USDA-WS	Nene & Waterbirds	Airfield/8,000 ft.
Inflatable Air Dancers	Static Deterrent	USDA-WS	Nene & Waterbirds	Airfield/8,000 ft.
Balloons	Static Deterrent	USDA-WS	Nene & Waterbirds	Airfield/8,000 ft.
Hazing with trained dogs	Active Hazing	Trained handler	Nene*	Main Base-wide
12 gauge shotgun	Pyrotechnics	USDA-WS	Nene**	Main Base-wide
Bangers/Whistles/Screamers	Pyrotechnics	USDA-WS	Nene**	Main Base-wide
Recorded Barks	Bioacoustics	USDA-WS	Nene**	Main Base-wide
Distressed Calls of Geese	Bioacoustics	USDA-WS	Nene**	Main Base-wide
Non-Toxic Repellent	Chemical	USDA-WS	Nene**	Main Base-wide

Herding or Harassing w/ Tethered Dogs	Active Hazing	USDA-WS	Nene**	Main Base-wide
Herding by Vehicle	Active Hazing	USDA-WS, WDDT	Nene**	Main Base-wide
Vehicle Harassment	Active Hazing	USDA-WS, WDDT	Nene**	Main Base-wide
On-Foot Harassment	Active Hazing	USDA-WS, WDDT	Nene**	Main Base-wide
Horns/Clapping	Noise Making	USDA-WS, WDDT	Nene**	Main Base-wide
Access Control (net/fence)	Exclusion	USDA-WS, WDDT	Nene & Waterbirds	Main Base-wide
Geotech Cloth	Static Deterrent	USDA-WS	Nene & Waterbirds	Surface waters
Bangers/Whistles/Screamers	Pyrotechnics	USDA-WS	Nene**	Basewide
Recorded Barks	Bioacoustics	USDA-WS	Nene**	Basewide
Distressed Calls of Geese	Bioacoustics	USDA-WS	Nene**	Basewide
Non-Toxic Repellent	Chemical	USDA-WS	Nene**	Basewide
Herding w/ Trained Dogs	Active Hazing	USDA-WS	Nene**	Basewide
Herding by Vehicle	Active Hazing	USDA-WS, WDDT	Nene**	Basewide
Vehicle Harassment	Active Hazing	USDA-WS, WDDT	Nene**	Basewide
On-Foot Harassment	Active Hazing	USDA-WS, WDDT	Nene**	Basewide
Horns/Clapping	Noise Making	USDA-WS, WDDT	Nene**	Basewide
Access Control (net/fence)	Exclusion	USDA-WS, WDDT	Nene & Waterbirds	Basewide
Geotech Cloth	Static Deterrent	USDA-WS WDDT	Nene & Waterbirds	Surface waters

*Technique has the potential to incidentally harass Hawaiian Waterbirds

**Base-wide BASH hazing will only be conducted to non-brooding/molting adults with no goslings present

***Vehicle harassment will not be used on nene families with mobile young

To note: Hazing to nene on the airfield or within the 8,000 ft. buffer zone includes brooding/molting adults

[1] Qualified biologist - is an individual with a combination of academic training in the area of wildlife biology or related discipline and demonstrated field experience in the identification and life history of the nene. (Federal Register, Vol. 84, No. 244, Dec 19, 2019)

[2] Brooding – a pattern of behavior of certain egg-laying animals, especially birds, marked by cessation of egg laying and readiness to sit on and incubate eggs. (Britannica)

[3] Molt - to lose a covering of hair, feathers, etc. and replace it with new growth in the same place. (Britannica)

[4] Trained Handler – Handlers will be experienced with nene and trained to identify breeding. They will evaluate all birds for breeding behavior prior to hazing

PROTOCOL 1: BASH HAZING WITHIN THE 8,000 FT. AIRFIELD BUFFER:

Only USDA-WS and the WDDT are authorized to haze nene and Hawaiian waterbirds within the airfield AOA. Hazing techniques used in the vicinity of the airfield include pyrotechnics (e.g. modified pistols, 12 gauge cracker shells, bangers), noise making devices (e.g. ultrasonic repellers, horns, sirens, propane cannons), static deterrents (e.g. effigies, mylar tape), bird deterrent lasers and active hazing (vehicle harassment and on-foot harassment) to reduce bird presence near the airfield. USDA-WS personnel conduct all pyrotechnics hazing activities and provide the majority of hazing support for the airfield. BASH hazing within 750 ft. of the airfield shall coordinate activities with the air traffic tower on the radio to alert them of the location and number of birds to ensure no hazards to flight operations.

Within 750 ft of the airfield, on-foot harassment, vehicle harassment and hazing with a trained dog is conducted for airfield to nene, Hawaiian stilts and Hawaiian ducks. The use of a trained hazing dog may be used within the 8,000 ft. buffer zone around the airfield, which includes launch pads to the north of the airfield. On foot harassment involves approaching the bird with vocalizations, hand clapping and/or whistles to encourage the bird to leave the area. If hazing involves a family the WDDT will haze the nene or Hawaiian waterbird using the on-foot technique. Qualified biologists and trained individuals actively survey for nesting behavior and if a pair is spotted, exhibiting nesting behavior, the WDDT will haze the pair and search the area for active nests or attempted nesting sites. Vehicle harassment and vehicle herding involves approaching nene or Hawaiian waterbird(s) using horns and lights to encourage the bird to leave the area. Hazing with a trained dog involves a professionally trained K9 team with voice commands and herding techniques, obedience training, etc. In addition to active hazing, static deterrents and exclusionary measures may be used. Intentional harassment of brooding adults (e.g., adults with an active nest or gosling) and/or adults in molt is prohibited under the 4(d) rule. The hazing techniques described here include intentional harassment of gravid females not actively nesting, families with mobile young, breeding pairs and/or molting adults with the understanding that these individuals are vulnerable and will be hazed with extra care. A qualified biologist or trained individual is an individual with a combination of academic training in the area of wildlife biology or related discipline and demonstrated field experience in the identification and life history of the nene (Federal Register, Vol. 84, No. 244, Dec 19, 2019).

If any pair of nene prior to nesting is found outside of the NNRZ but within 8000' of the airfield, the WDDT and trained PMRF personnel should haze nene to reduce successful nesting attempts. In addition to active hazing, static deterrents and exclusionary measures may be used throughout the 8,000 ft. buffer zone. Basewide hazing techniques (i.e. vehicle herding) may be used within the 8,000 ft. hazing zone to non-brooding adults.

USDA-WS and the WDDT will record the date and time of hazing, GPS coordinates, hazing technique used, how many birds, banding information, direction of flight and landing site if known, time of day, what the bird was doing and any other pertinent information. Hazing information will be compiled by USDA and submitted to the quarterly BASH working group. The BWG is comprised of representatives from airfield operations, USDA- WS, public works, natural resources, public affairs, security, and mission-related operations.

PROTOCOL 2: BASH HAZING BASEWIDE 4(D) COMPLIANT:

USDA-WS, the WDDT and authorized PMRF personnel, tenants and contractors may haze nene basewide using techniques listed in Table 1 that are not likely to cause injury to nene. Basewide hazing must be in compliance with the 4(d) rule and does **not** include hazing to brooding/molting adults or goslings. Pyrotechnics, bioacoustics, non-toxic chemical repellent, herding with tethered or trained dogs, herding by vehicle, vehicle harassment, on foot harassment and access control are able to be used basewide to discourage nene from habituating and nesting at Barking Sands. USDA-WS may utilize a trained dog to conduct hazing and/or herding of nene basewide.

The WDDT and authorized PMRF personnel, tenants and contractors will record the date and time of hazing, GPS coordinates, hazing technique used, how many birds, banding information, direction of flight, and any other pertinent information. Hazing information will be compiled by USDA-WS and submitted to the BASH working group.

PROTOCOL 3: BASH-RELATED NEST REMOVAL:

USDA-WS and PMRF NR may removenene nests if found in the current authorized NNRZ, or within the proposed 200 ft. from launch pads. These actions are not authorized under the 4(d) rule and have annual limits based on the incidental take statement in the Biological Opinion. In the event a nene has established a nest outside the NNRZ, hazing will not be conducted and the nest will be protected by a 100ft buffer, see Protocol 9. Proactive hazing before the nene breeding season will conducted at Barking Sands basewide, along with habitat management, to reduce the necessity of these actions.

If a nest/egg has been identified and determined to be within the current authorized NNRZ or the proposed 200 ft. from a launch pad buffer zone, the USDA-WS personnel and PMRF NR personnel will collect a GPS point of the nest, record the time and date of the nest discovery and will survey the area for any additional active nests or nesting attempts. USDA-WS and PMRF NR personnel will alert the BASH Working Group (including the NRM) immediately so information can be relayed to the USFWS and DLNR DOFAW within 1 day of nest discovery and PMRF can determine the next course of action. USDA-WS or NR will hang mylar deterrent tape to discourage nene from accessing nest upon initial observation. Photographs, time and personnel will be recorded. If, upon review of existing incidental take and assessed airfield safety risk, the BASH Working Group (BWG) determines nest removal is the recommended course of action, the PMRF NRM will notify the USFWS and DLNR DOFAW of intent to proceed with nest removal. If the number of eggs has been constant for more than 24 hours, it is assumed that the female is done laying. If a USFWS approved translocation plan is in place, USFWS and DOFAW will be contacted to discuss translocation of the eggs. If the nest cannot be removed immediately and the pair is repeatedly seen returning to the nest site, BASH Program Manager (Air Operations Officer) or PMRF Natural Resources staff will contact the PMRF command to request assistance from a CDO to enact hazing after dusk and over the weekend, as feasible. When determined feasible based on schedule and completion of laying, USDA-WS and/or PMRF NR personnel will remove the nest and bury the eggs. The PMRF NRM will notify USFWS and DOFAW within 1 day of nest destruction. BASH Program Manager and/or PMRF Natural Resources staff will coordinate with the Public Works Officer, Range Operations Officer and the Airfield Manager to remove vegetation around the nest (up to 1m) after 48 hours following nest destruction, or to install temporary fencing to discourage returning to the nest or future nesting attempts. Once nene have been absent for seven consecutive days, USDA-WS or PMRF NR personnel will remove the mylar tape and any temporary fencing, in coordination with the Airfield Manager. Nene nest removal will be recorded to

ensure removal activities do not exceed the USFWS's incidental take statement. USDA-WS and/or PMRF NR personnel will develop a report to include all details of the nest discovery (location, date and time, vegetation found in, number of eggs, picture of the nest, last hazing, monitoring prior to nest being discovered and further corrective actions such as additional hazing, habitat management, etc.) and details of all mitigation actions (timing of vegetation removal, timing of mylar tape installation, details on ongoing hazing, observance of nesting pair, timing and details of nest removal, etc.) the report will be submitted to the PMRF BASH Working Group and the USDA-WS District Supervisor. The PMRF NRM will submit the nest removal report and details to USFWS and DLNR DOFAW within 30 days in accordance with the reporting requirements in the Terms and Conditions of the Biological Opinion.

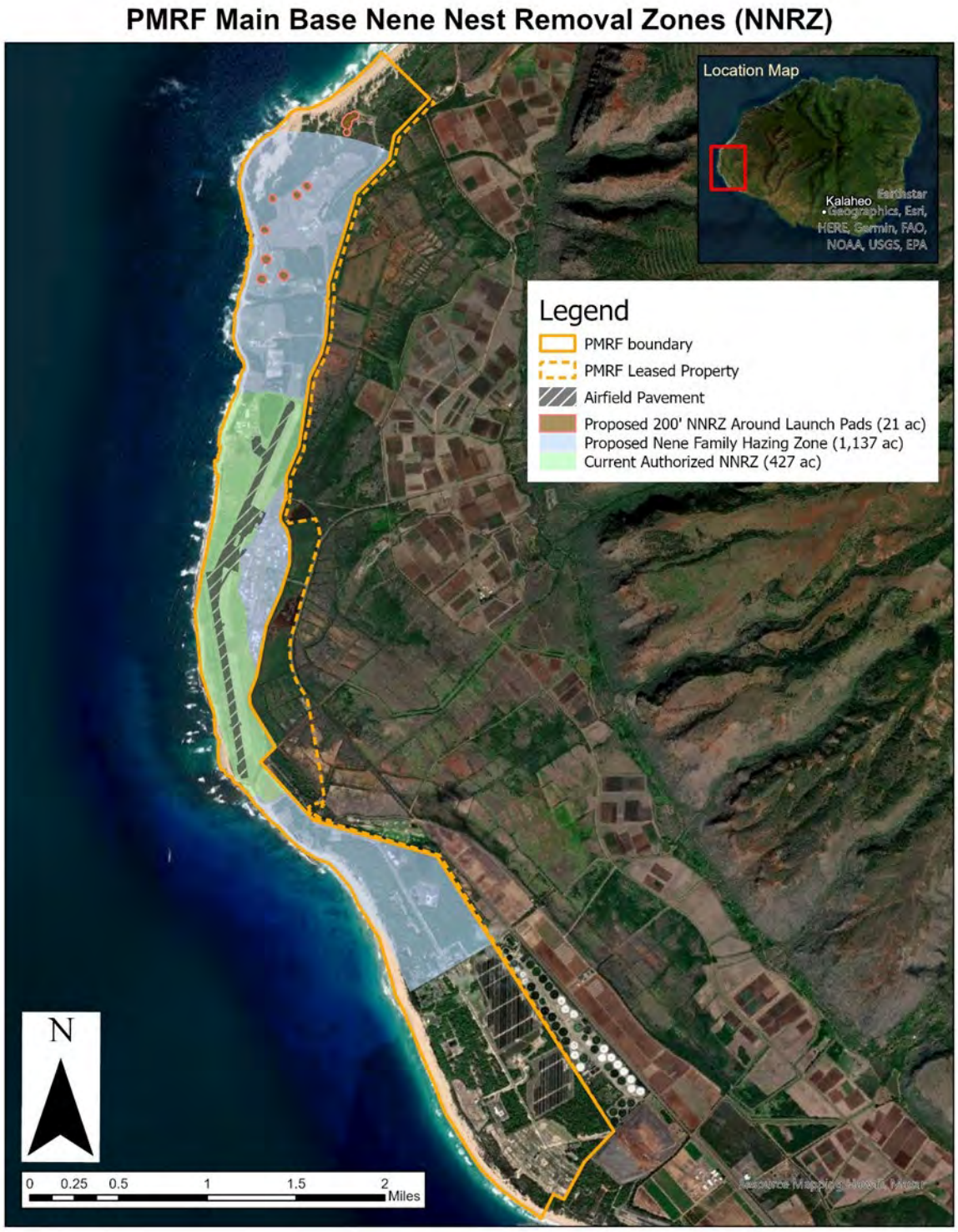

Figure 2. Proposed Nene Nest Removal Zone: On the airfield or within the lateral clear zone which extends to 750 ft on either side of the runway centerline, 150 ft on either side of the taxiway's centerlines, and 100 ft from the edge of aircraft parking aprons and 200 ft. from Launch Pads.

4. LAUNCH/LIVE FIRE HAZING & NEST REMOVAL PROCEDURES

4.1 Training & Personnel Involved

PMRF Range Operations has an interagency agreement with USDA-WS to conduct hazing in support of the military mission. USDA-WS will be the primary agency hazing around launch pads and live fire areas, primarily using trained hazing dogs. Any personnel involved in hazing ESA-listed species for launch pad operation and/or live fire exercises will be required to take a training course conducted by USDA-WS personnel. USDA-WS is responsible for maintaining a record of trained individuals.

U.S. Dept. of Agriculture, Animal Plant Health Inspection Services – Wildlife Services (USDA-WS):

USDA-WS will provide ESA-listed species hazing training for PMRF ordnance personnel, PMRF tenants that manage launch pads and related personnel that are authorized to be on site for live fire and launch pad events.

PMRF Ordnance Personnel, and Launch Operations Personnel/Tenants:

PMRF ordnance personnel, PMRF tenants involved in launch operations and personnel directly involved in launch pad activities and/or live fire exercises are able to assist with hazing efforts when USDA-WS is prevented from entering an area due to safety concerns. Most launch and live fire events have an associated Ground Hazard Area (GHA) based on the activity being performed. USDA is not authorized to enter the GHA, and will rely on mission critical staff to assist with hazing, if needed prior to an event.

4.2 Hazing & Nest Removal Techniques for Nene

Nene hazing related to launch and/or live fire exercises will occur within 500' of an area with an event scheduled within 30 days. Hazing will predominately be conducted using a trained hazing dog under the direction of USDA-WS. USDA-WS may also utilize active hazing (i.e. vehicle harassment and on-foot harassment), noise making (clapping, horns, etc.) as well as static deterrents (i.e. predator effigies).

USDA-WS may not able to haze nene within the 500' buffer zone when there is an aerial target or missile on the launch pad that have associated explosive safety quantity distance (ESQD) arcs. Only authorized personnel are allowed within ESQD arcs/GHA for safety purposes. In situations where USDA-WS is not able to haze within 500' of a launch or live fire exercise, trained personnel are able to haze within the 500' buffer to deter nene from loafing, foraging or nesting prior to a launch or live fire event. Personnel will be trained to haze utilizing vehicle harassment, on-foot harassment and noise making, as described in Protocol 4.

Launch areas on PMRF are managed by both PMRF range personnel and tenants. The Department of Energy, National Nuclear Security Administration (NNSA) manages the Kauai Test Facility (95 acres; 4 launch pads). The Missile Defense Agency (MDA) manages the Vertical Launch System (VLS) on 2.3 acres. PMRF manages both the 50K launch site (28 acres; 1 launch pad) and the north launch complex (3 acres; 9 launcher), as shown in Figure 3. Live fire training events may occur at both PMRF-managed sites; the north launch pad and 50K launch site. All launch and live fire sites, excluding the PMRF-managed north launch complex, are encompassed in the airfield's NNRZ, Figure 2.

Figure 3. Launch pad and live fire training areas at Barking Sands.

PROTOCOL 4: LAUNCH PAD/LIVE FIRE HAZING:

Only USDA-WS and trained personnel are authorized to haze nene within 500' of a launch pad or live fire training area. On-foot harassment, vehicle harassment and hazing with a trained dog is conducted within the 500' buffer area to brooding adults and nene families. On foot harassment involves approaching the bird with vocalizations, hand clapping and/or whistles to encourage the bird to leave the area. If hazing involves a family USDA-WS or trained personnel will haze nene using the on-foot technique first. If a pair is spotted, exhibiting nesting behavior, USDA-WS will haze the pair and search the area for active nests or attempted nesting sites. Vehicle harassment and vehicle herding involves approaching nene using horns and lights to encourage the bird to leave the area. Hazing with a trained dog involves a professionally trained K9 team with voice commands and herding techniques, obedience training, etc. In addition to active hazing, static deterrents may be used.

If a breeding pair of nene is found within 500 ft. of a launch pad or life fire training area with an event planned in 30 days, USDA-WS or trained PMRF personnel should haze nene to reduce successful nesting attempts. In addition to active hazing, static deterrents and exclusionary measures may be used

USDA-WS will record the date and time of hazing, GPS coordinates, hazing technique used, how many birds, banding information, direction of flight and landing site if known, time of day, what the bird was doing and any other pertinent information. Hazing information will be compiled by USDA and submitted to the Range Operations Officer, the BASH working group, the PMRF NRM and to applicable tenant(s). It is critical that hazing during air operations hours are coordinated with the Airfield Manager to ensure aircraft safety.

PROTOCOL 5: LAUNCH PAD/LIVE FIRE NEST REMOVAL:

USDA-WS and PMRF NR may remove nene nests if found within 200 ft. from a launch pad or live fire area with a launch or live fire exercise scheduled in the next 30 days. These actions are not authorized under the 4(d) rule and have annual limits based on the USFWS's incidental take statement. The 200 ft. buffer around launch pads designates the boundary for the Nene Nest Removal Zone (NNRZ). In the event a nene has established a nest outside the NNRZ, hazing will not be conducted and the nest will be protected, see Protocol 9.

If a nest/egg has been identified and determined to be within 200 ft. from a launch pad or live fire exercise with a launch or event scheduled within the next 30 days, the USDA-WS personnel and PMRF NR personnel will collect a GPS point of the nest, record the time and date of the nest discovery and will survey the area for any additional active nests or nesting attempts. USDA-WS and PMRF NR personnel will alert the BASH Working Group (BWG), Range Operations personnel, and the PMRF NRM immediately so information can be relayed to the USFWS and DLNR DOFAW within 1 day of nest discovery. PMRF will work closely with the tenant (if applicable) to determine the next course of action. USDA-WS or NR will hang mylar deterrent tape to discourage nene from accessing nest upon initial observation. Photographs, time and personnel will be recorded. If, upon review of existing incidental take the Range Operations Officer, in coordination with the tenant (if applicable), determines nest removal is the recommended course of action, the PMRF NRM will notify the USFWS and DLNR DOFAW of intent to proceed with nest removal. If the number of eggs has been constant for more than 24 hours, it is assumed that the female is done laying. If a similarly-aged nest is identified at Makaha Ridge or Koke'e sites, USFWS and DOFAW will be contacted to discuss translocation of the eggs. If the nest cannot be removed immediately and the pair is repeatedly seen returning to the nest site, Range Operations Officer or PMRF Natural Resources staff will contact the PMRF command to request assistance from a CDO to enact hazing after dusk and over the weekend, as feasible. When determined feasible based on schedule and completion of laying, USDA-WS and/or PMRF NR personnel will remove the nest and bury the eggs. The PMRF NRM will notify USFWS and DOFAW within 1 day of nest destruction. The PMRF Natural Resources staff will coordinate with the Public Works Officer, Range Operations Officer and the Airfield Manager to remove vegetation around the nest (up to 1m) after 48 hours following nest destruction, or to install temporary fencing to discourage returning to the nest or future nesting attempts. Once nene have been absent for seven consecutive days, USDA-WS or PMRF NR personnel will remove the mylar tape and any temporary fencing, in coordination with the Range Operations Officer and BWG. Nene nest removal will be recorded to ensure removal activities do not exceed the USFWS's incidental take statement. USDA-WS and/or PMRF NR personnel will develop a report to include all details of the nest discovery (location, date and time, vegetation found in, number of eggs, picture of the nest) and details of all mitigation actions (timing of vegetation removal, timing of mylar tape installation, details on ongoing hazing, observance of nesting pair, timing and details of nest removal, etc.) the report will be submitted to the Range Operations

Officer, associated tenant(s) and the PMRF BASH Working Group . The PMRF NRM will submit the nest removal report and details to USFWS and DLNR DOFAW in the PMRF quarterly INRMP report.

4. BIRD PROTECTION HAZING & NEST PROTECTION OPERATIONS & PROCEDURES

4.1 Training & Personnel Involved

Personnel involved in hazing ESA-listed species for bird protection purposes will be required to take a training course conducted by a PMRF qualified biologist. The training will cover biology and phenology of the bird species, proper techniques and considerations when hazing birds, indication of molting, identification of bird life stages and plumage, areas authorized for specific hazing actions as well as reporting requirements and procedures to capture hazing activities. All personnel authorized to haze for bird protection purposes will read this protocol and sign a form acknowledging their understanding and compliance with information and procedures outlined in this protocol. A record of trained and authorized individuals will be updated regularly by the PMRF Environmental office to reflect the current list of personnel authorized to haze for bird protection.

PMRF Natural Resources Staff:

The PMRF Natural Resources (NR) program, including PCSU staff, primarily conduct base-wide hazing in areas determined high risk for nene (i.e. along roadsides, near the oxidation pond, near construction sites, near mission activities and at recreational sites). PMRF NR will conduct hazing in situations where ESA-listed birds are interfering with the mission and at risk for injury or mortality. PMRF NR staff are authorized to haze brooding, molting adults or goslings, if determined necessary.

Other PMRF Personnel, Tenants and Contractors:

Additional PMRF personnel, tenants and contractors may be trained and authorized to conduct hazing if deemed necessary, to include security personnel, Command Duty Officers (CDOs), KIUC vegetation maintenance personnel, launch facility tenants, ordnance personnel and other personnel considered appropriate to assist with hazing for nene & Hawaiian waterbird protection. Personnel will not be authorized to haze brooding/molting adults or goslings/chicks unless determined it is a life or death situation (i.e. vehicle strike).

4.2 Hazing & Nest Protection Techniques for Nene and Hawaiian Waterbirds

It may be necessary to haze brooding/molting adults and/or goslings at all PMRF sites if a situation is observed that puts the bird(s) in imminent danger (e.g. vehicle strike, oxidation pond construction, launch activity). Additionally, it may be necessary to haze non-brooding/molting adults in situations that may injure the bird(s) (e.g. vegetation maintenance equipment, construction equipment). Hazing for bird protection is primarily conducted by the PMRF NR staff. Additional PMRF personnel and tenants may be authorized to haze for bird protection upon training by a PMRF qualified biologist. Table 2 lists the hazing techniques used for bird protection.

Table 2. Bird Protection Hazing Techniques for Nene and Hawaiian Waterbirds

Hazing Techniques for Bird Protection	Type	Personnel Authorized	ESA-Listed Species Used on	Location
Vehicle Harassment*	Active Hazing	PMRF NR	Nene & Waterbirds	All PMRF sites
On-foot Harassment	Active Hazing	NR, trained staff	Nene & Waterbirds	All PMRF sites
Horns/Clapping	Noise Making	NR, trained staff	Nene & Waterbirds	All PMRF sites

Inflatable Air Dancers	Static Deterrent	NR, trained staff	Nene & Waterbirds	All PMRF sites
Access Control (net/fence)	Exclusion	NR, trained staff	Nene & Waterbirds	All PMRF sites
Geotech Cloth	Static Deterrent	NR, trained staff	Nene & Waterbirds	All PMRF Sites

*Only authorized to non-brooding/molting adults with no goslings/chicks.

PROTOCOL 6: HAZING FOR BIRD PROTECTION- IMMINENT DANGER:

At all PMRF sites, if a situation is observed that puts a brooding/molting adult or goslings/chicks in imminent danger (e.g. vehicle strike), hazing is authorized to ensure their safety by gently hazing the nene or Hawaiian waterbird using the on-foot technique. No aggressive chasing of adult(s) with goslings/chicks will be allowed. Slowly walking towards the family will be the method used. This will discourage separation of adults from goslings/chicks, as well as any confusion that might cause injury to the birds. If a nene pair is spotted, exhibiting nesting behavior, contact the PMRF NRM immediately (808-335-4107). A PMRF biologist will search the area for active nests or attempted nesting sites. If a potential nest attempt is found with no eggs, the PMRF biologist will disassemble the nest and clear vegetation around the area to deter nene from returning. If a nest or egg is found, and the nest is outside the Nene Nest Removal Zone, the nest will be protected as outlined in Protocol 9.

PROTOCOL 7: HAZING FOR BIRD PROTECTION 4(d) COMPLIANT:

At all PMRF sites, if a situation is observed that puts a non-brooding/molting nene or Hawaiian waterbird adult in imminent danger (i.e. vehicle strike, construction equipment, launch activities, etc.), hazing is authorized to ensure their safety by gently hazing them using the on-foot technique. Observe the bird carefully before taking action to determine if there is a family present or nesting behavior. If nene are observed within the 8,000 ft. buffer to the AOA, contact the air traffic control tower to alert them of nene location and number of birds to ensure it is safe to haze without impacting air operations. Only USDA-WS and the WDDT is authorized to haze nene within the 8,000 ft. buffer area when there are active air operations. If outside the 8,000 ft. AOA buffer, hazing of nene and Hawaiian waterbirds is permitted may be conducted by trained individuals using on-foot harassment, auditory and visual techniques, including vehicle horns, human vocalizations, hand clapping, foot stomping, and flashing vehicle lights. PMRF NR staff may use vehicle harassment. Vehicles may not approach closer than 20 feet from nene or Hawaiian waterbirds.

Touching or handling of nene or Hawaiian waterbirds is not permitted. All sighting and hazing actions shall be recorded and submitted to the PMRF NR Office for accurate data collection and reporting to USFWS, USDA-WS and the BASH Working Group. Information needed for nene sighting/hazing includes: Date and time of sighting, location of sighting (coordinates), number of birds, banded or un-banded, life stage of birds, behavior, hazing technique used, direction of flight, and any other pertinent information. Details to be submitted via email to the BASH Working Group and PMRF Natural Resources Manager (NRM) at brooke.mcfarland@navy.mil. The PMRF NRM will submit the nene hazing details to the USFWS and DLNR DOFAW in the PMRF quarterly INRMP report.

PROTOCOL 8: PRE-CONSTRUCTION/VEGETATION MAINTENANCE NEST SURVEYS:

One week prior to commencement of vegetation maintenance or construction activities in areas with grass taller than 10”, the project manager will contact the PMRF NRM to request a qualified biologist surveys the area for nene and Hawaiian waterbird nests. Nest surveys are required throughout the year due overlapping breeding seasons and the potential for Hawaiian ducks, coots and gallinules to nest year-

round. Once the biologist has completed the nest survey and determined no nests are presence, vegetation maintenance or construction activities may commence. If a nest is found, refer to Protocol 9. If a nest is discovered by vegetation maintenance or construction worker(s), the worker shall call the PMRF NR hotline (808-208-4416) to report the nest and no activities may occur within 100 ft. of the active nest. The nest may not be destroyed until the chicks have hatched and fledged or until the nest has been determined abandoned by a qualified biologist.

PMRF NR staff will remove the buffer when no longer needed. A PMRF biologist will identify the nest, collect information on the nest and erect a 100 ft. buffer fence around the nest to avoid further disturbance.

PROTOCOL 9: NENE & HAWAIIAN WATERBIRD NEST PROTECTION:

If nesting behavior is observed or a nest/egg is discovered at any of the PMRF sites, contact the PMRF NR personnel and USDA-WS personnel immediately. For situations where nest protection is deemed the proper course of action (based on distanced from the airfield), PMRF NR biologists and/or USDA-WS personnel will collect a GPS point of the nest and take a photograph. The PMRF biologist and/or USDA-WS personnel will erect temporary fencing or caution tape 100 ft. (if appropriate) from the nest to avoid further disturbance and not block birds from foraging areas or water. Predator traps with anti-gosling/chick guards will be installed 100 ft. away from the nest to protect from predation during the 30 day incubation period. PMRF biologists will monitor the nest to record the success or failure of the nest. Data collected for nest protection include: Date and time nest was found, activity near nesting site, location of nest (coordinates), number of eggs, vegetation found in and any other pertinent details. The PMRF NRM will submit the nest protection details to the BASH Working Group, USFWS and DLNR DOFAW in the PMRF quarterly INRMP report.

1. OXIDATION POND BOTULISM PROTOCOLS

Do not risk personal health and safety in an attempt to capture affected birds.

The Oxidation Pond should be monitored daily for breeding activity and injuries/mortalities. This can be done concurrently with other monitoring efforts (basewides, vegetation clearing, etc) and takes approximately 15 minutes. Walk around the complex paying specific attention to the main and outflow basin. Scan the birds in the area and briefly assess each bird you see. Ducks, coots, stilts, and night herons generally flush or move further into the basin when you get close, so any bird that you can walk up to should be investigated closely. Check patches of vegetation for nests, especially if there are birds exhibiting breeding behavior in the area.

Botulism monitoring: Monitoring for botulism begins when a bird (live or dead) is found with suspected botulism, ie, a carcass is found at the oxidation pond with no known cause of death. Clear predations, mortalities due to injury, or old carcasses do not prompt botulism protocols. Clinical signs of botulism in a live bird include weakness, lethargy, inability to hold head up or fly, and partial paralysis (droopy eye lids, sunken eyes, drooping wings, unable to use legs, labored breathing, inability to hold head up, etc.),

If you find a live bird with symptoms of botulism, efforts should be made to capture the individual and transfer it to S.O.S. Make sure to wear proper protective gear including gloves, towels, safety goggles,

and/or face shields (if dealing with a bird covered in raw sewage). Also alert S.O.S. that this bird has been contaminated so they can protect themselves as well. Any gear used to capture the individual should be cleaned with bleach before using it for another bird.

If you find a carcass, consider if it is fresh enough to send for botulism testing (see SOP in Botulism folder for "USGS HFS Carcass Shipment" for protocol). If you suspect it is, put it in the USDA fridge in the shed. Call Peter Silva USDA to notify him that you are storing a carcass there temporarily.You can assess whether it is fresh enough to test based on the following text and figure from the USGS HFS SOP and call HFS. Note that carcasses sitting in sewage will decompose even more rapidly.

"For an accurate diagnosis of botulism, it is very important to collect only fresh carcasses (ideally within a few hours following death)"
"Carcasses that are decomposed or scavenged are unacceptable. If the carcass has an odor, is soft and mushy, has skin discoloration, feathers or skin that easily rubs off, or has maggots present, it is too decomposed for testing"

Report to the Navy NRM as you would any injury or mortality. Also report suspected or confirmed botulism cases to https://www.hiwaterbirds.com/report-a-sick-waterbird by emailing hiwaterbirds-grp@hawaii.edu (we do this reporting, not SOS). Report format to put in the email is as follows :

Reporters Name:
Reporters Phone Number: 808-208-4416
Reporters Email Address:
Location of the sick bird(s): PMRF, Oxidation ponds
Species affected:
Approximate number of animals affected:

If there is a suspected botulism outbreak, either from a bird still alive or a suspicious carcass, monitoring efforts at the oxidation pond will increase and daily checks must be performed for 10 consecutive calendar days following the first incident. This includes weekends and/or holidays. If additional carcasses are found during this period, the 10 day period is reset and continues for an additional 10 days after the last carcass was found. Carcass removal is an extremely important step in reducing the potential or longevity of a botulism outbreak.

5. LITERATURE CITED

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APPENDIX B. PMRF Hawaiian Hoary Bat Roost Detection Protocol, 2020

Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) Roost Detection Protocol

For emergency tree trimming during pupping season

Pacific Missile Range Facility (PMRF), Kauai, Hawaii

Photo credit USGS, Frank Bonaccorso

December 2021

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1. INTRODUCTION

1. Purpose

This protocol describes methods and situations when surveying for roosting Hawaiian hoary bats (*Lasiurus cinereus semotus;* HBAT) is determined necessary. Surveys shall be conducted prior to tree trimming or removal for trees 15 feet or taller during the bat pupping season, 1 June to 15 September. Trees shall not be trimmed or cut during this period, unless there is an emergency situation requiring immediate action. Emergency situations are when unforeseeable events cause tree(s) to pose a threat to human safety or property, and where mitigation of that threat is not possible or practical. This protocol ensures that in instances where tree trimming or removal is deemed absolutely necessary during the bat pupping season, there are methods in place to reduce potential take to the endangered Hawaiian hoary bat. This protocol does not authorize tree trimming or removal during the bat pupping season for poorly planned contracted services or to utilize end of year funds.

This protocol does not replace the need for coordination of tree trimming or removal activities with the PMRF Natural Resources (NR) office for activities throughout the year. Recurrent and one-time tree trimming activities must be planned to occur outside of the pupping season of June 1st thru September 15th. Removal of coconut nuts or dead coconut palm leaves will not be subject to this protocol, but should be visually inspected during harvest to ensure no pups are present.

2. Location and Setting

This protocol will apply to all of the Pacific Missile Range Facility and its satellite installations, including: Barking Sands, Kamokala Ridge, Makaha Ridge, Milolii Ridge, Koke'e sites, and Port Allen , as well as utility/road easements needed for essential maintenance (See Figure 2.0-1). These sites encompass 2,409 acres (plus easements), with elevations from sea-level at Barking Sands to 3,710 feet at the Koke'e sites.

Woody vegetation found across the installation is largely non-native, most commonly kiawe (*Prosopis pallida*), haole koa (*Leucaena leucocephala*), ironwood (*Casuarina equisetifolia*) and, at higher elevations, strawberry guava (*Psidium cattleianum*). Native trees are primarily found at higher elevation sites and include koa (*Acacia koa*) and ohia lehua (*Metrosideros polymorpha*). Large fruiting trees are not common at the installation.

3. Training and Personnel Involved

Thermal survey training will be conducted by a knowledgeable surveyor with experience in the use of the equipment and in bat roost detections. Training will be conducted annually, and will be held for PMRF NR staff, including Pacific Cooperative Studies Unit (PCSU) contractors and other relevant contractors, as determined by Public Works Officer (PWO). Training records will be maintained by the PMRF Environmental Office.

Prior to conducting surveys independently, the following training regime will be followed:

- Sign off on protocol
- Sign off on safety procedures
- 1 session with equipment in office, familiar with troubleshooting unit and functions
- At least 1 session during nighttime hours with HBAT or non-target species visible
- At least 1 session during early morning performing full protocol with trainer using bat decoy if no HBAT seen
- An additional training session is required prior to 1 June every year, even for experienced surveyors

2. LISTING STATUS & BIOLOGY

The Hawaiian Hoary Bat is listed as endangered under the federal Endangered Species Act (ESA) due to population declines from habitat destruction and lack of population information (USFWS 1998). Hoary bats pup in June, giving birth to twins, and primarily utilize woody vegetation greater than 15 feet in height for birthing and pup-rearing (Bonaccorso et al. 2015). Although adult bats may travel up to 8 miles in a night to forage (Bonaccorso et al. 2015), pups are non-volant for 2-3 months and remain in their birth tree (USFWS 1998).

Although data is sparse, HBAT are known to breed on Kauai, and are also known to utilize a wide range of habitat types. To identify areas and times of use at the installation, an acoustic survey was conducted at PMRF over six months from September 2010 to February 2011 (Bonaccorso and Pinzari 2011). Bats were detected across the entirety of the installation, however the number of bat calls varied by region, elevation and month. The northern part of the base, in particular, is likely used by fledging pups and mating adults, and the overall installation was found to offer habitat for the species. Therefore, it is possible that hoary bats are breeding on the installation and that they may be present in all trees 15' or taller.

3. BAT ROOST DETECTION PROTOCOL

The following survey protocol is based off the *Tree Solutions & Environmental Consulting Services, Inc. Monitoring and Protection Services for Hawaiian Hoary Bats* and the *Hawaiian Electric 2018 Ti400 Hoary Bat Field Guide*.

Roost detection surveys will take place *prior* to tree trimming during the bat pupping season from June 1st to September 15th. The surveys shall commence in the early morning and must be complete by 7am. The Natural Resources Manager (NRM), in coordination with the Installation Environmental Program Director (IEPD) and PWO, will make a determination if the proposed tree trimming is required and therefore a roost detection survey is required. An emergency situation may include situations where there is an imminent threat to human health or safety, or where there is a utility failure that may result in fines or community implications.

1. Equipment

A thermal imaging system, such as the Fluke Ti401 PRO Thermal Camera or the FLIR Scout III Monocular, will be used. Both have been field tested and have demonstrated that they can identify HBAT heat signatures (Nimz and Golden). Only trained individuals will be permitted to use this equipment.

Proper Personal Protection Equipment (PPE) will be used during these surveys. PPE includes the following:

- Hard Hats
- Reflective Safety Vest
- Headlamp with red light

The general equipment needed is as follows:

- Fluke Ti400 (Ti401 PRO Thermal Camera) or the FLIR Scout III Monocular, or similar
- PPE
- Binoculars

- Headlamp
- Field Notebook
- Approved Survey Form
- Measuring tape and/or Laser Ranger finder
- Brightly colored flagging or other marker
- A hard copy of the Hoary Bat Roost Detection Protocol
- GPS
- Camera

2. Survey Procedure

Pre-survey: Determination of necessity, communication plan

As outlined in the Annual Base Notice for Tree Trimming during Bat Pupping Season, the Natural Resources Manager must be contacted prior to the emergency removal of any part of any vegetation 15' or higher from 1 June to 15 September in order to provide opportunity for surveys. If the risk is determined to be immediate, biologists may not have the opportunity to survey prior to removal. The Natural Resources Manager will contact the Installation Environmental Program Director and Public Works Officer, as well as the Fish and Wildlife Service for notification of any emergency actions. Except when not possible due to the nature of the emergency, the day prior to tree trimming PMRF NR personnel will identify trees that are 15ft or higher that are designated to be cut/disturbed. Personnel will count how many trees are 15ft or higher and identify all trees within this category. Photographs of the area prior to trimming will be taken. Trees to be cut or removed will be flagged, and bat roosting surveys of the flagged trees will occur the following morning, prior to 7am.

Survey: Communicate findings, document active trees

Surveys will occur in the 24 hours prior to trimming activities during the HBAT pupping season (June 1st to September 15th). The surveys will be completed within a half hour of sunrise. Too much daylight can result in incorrect readings from the thermal imager. No tree trimming shall commence prior to roost detection surveys, at outlined in this protocol.

All trees 15ft or greater will be examined from all angles from the ground using an approved thermal imager. All branches on each tree being surveyed will be scanned from all angles. The surveyor will walk around the tree at the drip line, examining and scanning the branches and then move 10ft farther from the base of the tree and again walk around the tree. If determined necessary, extra time will be spent observing dense vegetation as well as on the north and west facing areas of the tree. If a thermal signature similar to a bat is observed, a high-powered flashlight will be used to determine whether it is a bat.

All wildlife detected in the trees will be recorded on the data sheet (Appendix 1), along with observation height and information about the tree. If a bat is found in a tree, the tree(s) will be marked with brightly colored flagging. These marked trees with potential bat roosts are not to be cut or disturbed, and their location will be recorded with a GPS device. The results of the survey and identified bat roost locations will be communicated to all personnel involved in the action.

The survey time for each tree will vary but should take approximately 15-30 minutes per tree. If the structure of the tree is such that the surveyor is not satisfied that the thermal imager and high powered flashlights cannot adequately detect a bat through the branches, the tree shall be treated as if a bat is present. The tree(s) in which a bat is present shall not be disturbed until the bats are no longer roosting/pupping in the tree, unless the removal has been classified as an emergency and removal cannot be postponed. In such an instance, the tree will be thoroughly searched after

removal, and findings reported to FWS. All trees or branches within 100' of the roost site shall also be left undisturbed. Trees with non-target detections, that are determined not to be nests of MBTA-listed species, may be trimmed as necessary. Trees that have been surveyed and cleared of bat activity will be delineated by removal of colored flagging. Status of trees will be communicated between the authorized biologist and the tree trimming/removal crew prior to commencement of work.

Prior to tree trimming, the PMRF NRM or designee must provide verbal or written authorization to commence tree trimming activities based on negative survey results to the POC managing the tree trimming/removal work. If the tree services are contracted, the PMRF NRM will coordinate with the government project manager. If bats are determined to be present, the PMRF NRM will coordinate with the PWO to determine the necessity of the activities and determine a plan forward.

After the trees in which bats are present are clearly marked, the 100' buffer is clearly marked, photos have been taken, and the tree trimmer and associated personnel have been briefed, the biologist may leave. Tree trimmers have a 24 hour window to accomplish tree trimming on approved trees. If the 24 hour window expires, a new survey will need to be conducted.

Post survey: Documentation, reporting, follow-on surveys for active roosts

Following trimming, an assessment of the number and species of trees affected will be made. Photographs will be taken of the area, as similar in location, orientation, and composition to the pre-trimming photographs as possible. All marked roost trees will be checked to verify that they were not disturbed and a carcass search will be conducted among the downed woody material to ensure no bats were overlooked during surveys. Carcasses and injured animals will be collected.

If a roost site with bat pups is identified, biologists will conduct weekly checks starting mid-August to identify whether the pups have fledged. The trees should be documented with photographs (if it is safe to do so without disturbing the bats), and measurements taken (dbh, height of tree, height of observations throughout surveys). Once a biologist has determined that bats are no longer in the tree, the markers shall be removed and the tree can be disturbed.

4. REPORTING

A final report documenting the tree trimming/disturbance will generated by the PMRF Environmental Office and will be submitted to the Fish and Wildlife Service (USFWS) within 30 days of the tree trimming (Appendix 2). This report will document, at a minimum, location, time, reason for trimming/ cutting, survey date and time, findings and number and species of trees affected. If any bat pups or carcasses are located during the survey or post-action survey, those findings will be reported to USFWS within 24 hours and the specifics of the finding will be made available within 30 days.

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APPENDIX 1. ROOST DETECTION SURVEY FORM

PMRF Hawaiian Hoary Bat Roost Tree Survey Form

Date: _____ **Location**:_____ **Observers**: _____

Start time:_____ **End Time**:_____ **GPS?** Y / N

Cloud Cover:
___Clear
___Partly cloudy
___Overcast

Rain:
___None
___Mist/ occas.
___Rain

Wind:
___0-15
___15-25
___25+

Elevation:_____ft/m

Survey Area:

Location	Tree Species	Height (ft)	# of Trees

Observation Type:

___ None (No bats observed)
___ Incidental Obs. (bat seen in passing)
___ Host Tree Search (thermal survey of tree)

Tree Species	GPS	Aspect (general)	Tree height (ft)	Roost Height (ft)	DBH	Roost to Tree Trunk Distance (ft)

Observer Directions / Comments / Next time: (Flagging Scheme):

_____
_____
_____
_____

SKETCH MAP OF SITE:

APPENDIX 2. REPORTING FORM

PMRF After-Action Reporting Form for Emergency Tree Trimming

ACTION DATE:

LOCATION (description, inc. elevation and gps):

REQUESTOR:

ACTION REQUESTED (method, area to be treated):

IMPACT IF ACTION WAS POSTPONED:

PRESURVEY DATE/ TIME:

NUMBER/ SPECIES OF TREES >15' IMPACTED:

HBAT SURVEY DATE/ TIME:

OBSERVERS:

METHODS:

BATS OBSERVED? (if yes, attach survey form):

POST-ACTION SURVEY DATE/TIME:

POST-ACTION SURVEY METHOD:

BATS OBSERVED?:

PICTURES (attach pre- and post-action pictures):

Appendix L

Wetland Survey Report

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Final

Wetland Delineation Report at Pacific Missile Range Facility in Support of Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate Environmental Impact Statement

Kauaʻi, Hawaiʻi

Prepared for:

Department of the Navy

Naval Facilities Engineering Systems Command, Pacific

258 Makalapa Drive, Suite 100

Joint Base Pearl Harbor-Hickam, HI 96860-3134

Prepared under: Contract N62742-18-D-1802, Task Order N6274222F0206

January 2024

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Final
Wetland Delineation Report in Support of Pacific Missile Range Facility and Kōkeʻe Park Geophysical Observatory Real Estate EIS Kauaʻi, Hawaiʻi

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ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CWA	Clean Water Act
DLNR	Department of Land and Natural Resources
EIS	Environmental Impact Statement
FEMA	Federal Emergency Management Agency
GIS	geographic information system
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Systems Command
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PMRF	Pacific Missile Range Facility
U.S.	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

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CHAPTER 1 INTRODUCTION

This wetland delineation report details the results of a delineation of waters of the United States (U.S.) at Pacific Missile Range Facility (PMRF) in support of the proposed PMRF and Kōkeʻe Park Geophysical Observatory (KPGO) Real Estate Environmental Impact Statement (EIS). The United States (U.S.) Department of the Navy (Navy) and National Aeronautics and Space Administration (NASA), in coordination with the Hawaiʻi Department of Land and Natural Resources (DLNR), are preparing an EIS which evaluates the potential environmental consequences of the Navy's and NASA's proposal to retain the use of approximately 8,172 acres and 23 acres, respectively, in support of the Navy's continued and ongoing operational continuity and sustainment at PMRF and NASA's continued operations at KPGO. The Navy's 8,172 acres are a part of the larger PMRF installation which includes the entire instrumented range on land and ocean areas that support surface, subsurface, air, and space operations.

Between 1964 and 2007, the Navy and NASA began leasing property from the DLNR-owned land primarily for passive encroachment buffer as well as for mission operations, access, and utilities at the following five general locations: Main Base (also referred to as Barking Sands), Kamokalā Ridge, Mānā Water Well, Miloliʻi Ridge, and Mākaha Ridge. The easement areas provide safety buffer zones for training and testing missions and prevent incompatible development. The existing Navy and NASA real estate agreements with the DLNR are set to expire between 2027 and 2030. The lease areas are illustrated in Figure 1, Appendix A.

Under the direction of Naval Facilities Engineering Systems Command (NAVFAC), and in accordance with the 19 July 2022 Statement of Work (SOW) for Task Order N6274222F0206, Stantec GS Inc. ("Stantec") performed a jurisdictional wetland delineation within the approximately 220.5-acre PMRF wetland study area (hereafter, study area). The study area is located within the Mānā Plain in portions of the Nahomalu Watershed (12,352 acres), Kaʻawaloa Watershed (8,192 acres), and the Hoʻea Watershed (9,728 acres) and is illustrated in Figure 2, Appendix A. The study area borders the developed military installation Main Base and consists of fallow agricultural areas, non-native dominated scrub areas, wetlands, and drainage ditches. Field investigations occurred from 2 through 6 October 2023. Normal to dry climatic conditions were present during the delineation fieldwork.

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CHAPTER 2 OBJECTIVE

The primary objective of the wetland delineation was to determine which areas meet the necessary criteria to be considered jurisdictional wetlands and other waters of the U.S. that are present within the study area.

2.1 DEFINITION OF WATERS OF THE UNITED STATES

Currently, the term waters of the U.S., based on 33 Code of Federal Regulations (CFR) 328.3 means:

(1) Waters which are:
  (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
  (ii) The territorial seas; or
  (iii) Interstate waters;
(2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
(3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
(4) Wetlands adjacent to the following waters:
  (i) Waters identified in paragraph (a)(1) of this section; or
  (ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;
(5) Intrastate lakes and ponds, streams, or wetlands not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section.

Per federal regulatory policy (33 CFR Part 328), wetland areas are defined as *"those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."*

2.2 SACKETT V. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

On 29 August 2023, the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA) announced a final rule amending the 2023 definition of "waters of the United States." The amendments conform with the U.S. Supreme Court's 25 May 2023 decision in the case of *Sackett v. USEPA.* While the USACE's and USEPA's 2023 rule defining "waters of the United States" was not directly before the Supreme Court, the decision in *Sackett v. USEPA* made clear that certain aspects of the 2023 rule are invalid. Therefore, the USACE and USEPA have amended key components of the regulatory text to conform to the Supreme Court decision. Per the USACE and USEPA, "the final rule provides clarity for protecting our nation's waters consistent with the Supreme Court's decision while advancing infrastructure projects, economic opportunities, and agricultural activities." The two major changes are as follows:

1) Revised definition of adjacent to mean "having a continuous surface connection."
2) The rule removes the significant nexus test from consideration when identifying tributaries and other waters as federally protected.

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CHAPTER 3 METHODS

3.1 DESKTOP ANALYSIS

3.1.1 Existing Data Analysis

Potentially occurring aquatic resources were identified through a synthesis of the data sources listed and described below. The desktop analysis was completed by overlaying the following geographic information system (GIS) data sources on the wetland delineation survey area: National Wetlands Inventory (NWI) Database (U.S. Fish and Wildlife Service [USFWS] 2019), U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil maps (USDA 2019), U.S. Geological Survey (USGS) topographic maps (USGS 2020), Federal Emergency Management Agency (FEMA) 100-year floodplain mapping (FEMA 2021), and available aerial photography by Maxar (2022). All desktop analysis figures are provided in Appendix A.

As part of the desktop analysis, the available GIS data were reviewed to evaluate the potential presence of aquatic features such as streams and other water bodies, wetlands, and soil types that may indicate a potential for wetlands or other waters of the U.S.

3.1.2 National Wetlands Inventory

The NWI is a program managed by the USFWS that provides geospatial information to the public regarding the extent and status of wetlands and deepwater habitats in the U.S. Aquatic features mapped in the NWI are primarily based on the interpretation of high-altitude aerial photographs and topographic maps, and as such are not necessarily accurate or up-to-date, but they indicate the presence of potential jurisdictional features. Conversely, the absence of NWI-mapped features is not sufficient to conclude that no jurisdictional water bodies or wetlands are present. NWI-mapped features in the survey area are provided in Figure 3, Appendix A.

Aquatic habitats in the NWI are classified according to the Cowardin classification system (Cowardin et al. 1979). This classification system is used to hierarchically define wetland and deepwater habitat types by system, subsystem, class, and subclass for the purposes of inventory, evaluation, and management. The Cowardin system classifies aquatic habitats by landscape position, vegetation cover, hydrologic regime, and any species modifiers. The Cowardin system applies to all aquatic habitats less than 6.6 feet (2.0 meters) deep, including unvegetated water bodies, as wetlands. Although the CWA does not consider naturally unvegetated areas to be wetlands except in problematic and/or atypical situations (USACE 1987), the Cowardin system is the most widely used classification system for wetlands and other waters of the U.S., and it provides the federal standard for wetland classification adopted by the Federal Geographic Data Committee (2009). The Cowardin system can be applied to non-jurisdictional aquatic habitats as well.

The Cowardin system includes five major wetland types: marine, estuarine, lacustrine, palustrine, and riverine. The NWI-mapped habitats and acreages in the wetland delineation survey area are provided in Table 1 and are shown in Figure 3, Appendix A.

Table 1 National Wetlands Inventory Features in the Survey Area

Mapping Attribute	*Cowardin Classification Name*	*Area (acres)*
R2UBHx	Riverine, lower perennial, unconsolidated bottom, permanently flooded, excavated	7.70
R4SBCx	Riverine, intermittent, streambed, seasonally flooded, excavated	1.90
PEM1Fd	Palustrine emergent, persistent, semi-permanently flooded, partly ditched/drained	183.90
	Total	**193.5**

The NWI mapping has classified the agricultural ditches as Riverine lower perennial and intermittent. Cowardin loosely classifies Riverine as all wetland and deepwater habitats contained within a channel, natural or manmade. The two exceptions are areas dominated by vegetation or having salt concentration in excess of 0.5 parts per thousand.

The ditches could likely be better classified as Palustrine emergent, unconsolidated bottom, permanently flooded, or semi permanently flooded and excavated (PEMUbFx or PEMUbGx), which is a more typical classification for agricultural ditches.

3.1.3 United States Department of Agriculture Soils

The soils identified in the project area were compared to the NRCS National Hydric Soils List. The soil types, acreages, and hydric ratings are presented in Table 2 and are shown in Figure 4, Appendix A.

Table 2 Soil Types Mapped in the Survey Area

Map Unit Symbol	*Map Unit Name*	*Hydric Status*	*Area (acres)*
Nh	Nohili clay	no	16.8
Fd	Fill land	no	16.4
JfB	Jaucus loamy fine sand 0-8 percent slopes	no	39.5
MnC	Mamala cobbly silty clay loam, 0-2 percent slopes	no	9.8
kf	Kaloko clay loam	yes	104.8
Kfa	Kaloko clay 0-2 percent slopes	yes	33.2
		Total Hydric Soils	138.0
		Total All Soils	**220.5**

3.1.4 United States Geological Survey Topography

The USGS topographic mapping identified numerous ditches as the only aquatic features within the survey area (see Figure 5, Appendix A).

3.1.5 Federal Emergency Management Agency

The FEMA mapping identified the entire wetland delineation survey area as occurring within the 100-year floodplain (see Figure 6, Appendix A).

3.1.6 Historic Mapping of Wetlands and Ponds

Historic mapping dated 1907 and 1921, were evaluated and they identified large wetland and pond areas within the study area. Approximately 136 acres of wetland and 43 acres of Limaloa and Kawai‘ele ponds/open water were historically mapped where the NWI wetlands and hydric soils are located, potentially confirming historic extent of wetlands (USGS 1910) (Figure 7, Appendix A).

3.1.7 Portions of the Survey Area to be Targeted for Delineation

The NWI mapping identified 193.5 acres of possible wetlands and the soils mapping identified 138 acres of potential hydric soils in the study area. NWI and NRCS Soils mapping can overestimate or underestimate wetland extent due to the types of analyses conducted for those mapping features.

Furthermore, the USGS mapping identified numerous ditches throughout the survey area. Based on the combined presence of these additional features, the entire study area was targeted and assessed in the field during the wetland delineation effort to ensure that no smaller wetland areas were missed (as required by the wetland delineation protocol).

3.2 FIELD ANALYSIS

The wetland delineation was conducted by experienced and qualified Stantec wetland delineators. The delineation followed the protocols and methodologies outlined in the *Corps of Engineers Wetlands Delineation Manual* (USACE 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Hawaii and Pacific Islands Region (Version 2)* (USACE 2012), and the USACE Regulatory Guidance Letter No. 05-05 *Ordinary High Water Mark Identification* (USACE 2005). The protocols and methodologies followed the currently accepted approach by the Honolulu District Army Corps of Engineers.

3.2.1 Delineation Procedures

Procedures and standards used for delineating and classifying aquatic habitats in the study area are described below.

3.2.1.1 Wetlands

Per USACE requirements, evidence of a minimum of one positive wetland indicator from each parameter (hydrophytic vegetation, hydric soil, and hydrology) needs to be met in order to make a positive wetland determination. Data collected at sample points was recorded on *Wetland Determination Data Forms – Hawai'i and Pacific Islands Region (Version 2.0)* (USACE 2012).

Field surveys were conducted between 2–6 October 2023 to identify the approximate extent of wetlands and other waters based on dominant vegetation type, hydrology, topography, and landscape/geomorphic position. In portions of the study area deemed to contain possible wetlands, the soil, vegetation, and hydrology were evaluated in detail at representative sample points. The completed wetland determination forms are included in Appendix B. All wetlands and drainage features were mapped in the field using a global positioning system unit with a sub-meter level accuracy receiver. After field work was completed, location data was entered into GIS software, potential jurisdictional areas were mapped, and the acreages of the delineated features were calculated.

<u>Determination of Hydrophytic Vegetation</u>

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (USACE 1987). Such areas are characterized by the dominance of plant species that typically occur in wetlands. Hydrophytic vegetation determinations are based on the wetland indicator status of dominant plant species.

Sample points were evaluated to determine the dominant plant species in the following strata as defined by USACE (2012).

- Tree stratum – woody plants 3 inches (7.6 centimeters) or more in diameter at breast height, regardless of height.
- Sapling/shrub stratum – woody plants less than 3 inches (7.6 centimeters) in diameter at breast height, and greater than or equal to 3.28 feet (1 meter) tall.
- Herb stratum – all herbaceous plants, including herbaceous vines, regardless of size.
- Woody vines – consists of all woody vines greater than 3.28 feet (1 meter) in height.

Hydrophytic vegetation determinations were based on the wetland indicator status (USACE 2020) of species that composed the plant communities. Wetland indicator status is a relative measure of a plant species' potential to occur in wetlands. Hydrophytic vegetation indicator status categories are defined as follows (USACE 2020):

- Obligate Wetland – almost always occurs in wetlands, rarely in uplands.
- Facultative Wetland – usually occurs in wetlands but occasionally found in uplands.
- Facultative – commonly occurs in wetlands or uplands.
- Facultative Upland – occasionally occurs in wetlands but usually occurs in uplands.
- Obligate Upland – rarely occurs in wetlands, almost always in uplands.

Hydrophytic vegetation determinations followed the standard procedures set forth in USACE (2012). Plant wetland indicator statuses used in this report are consistent with the National Wetland Plant List (USACE 2020).

Determination of Hydric Soils

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Hydric soil indicators are formed predominantly by the accumulation or loss of iron, manganese, sulfur, or carbon compounds in a saturated and anaerobic environment (USACE 2012).

Wetland biologists evaluated and documented the morphological characteristics of all visible soil horizons observed in excavated soil profiles at each sample point. Soil pits were excavated to depths of up to 20 inches (51 centimeters), except in instances where positive hydric soil indicators were obtained above that depth or digging was met with refusal (e.g., rock, gravel).

Soil profile analyses included descriptions of horizon thickness (depth); matrix color; texture; and type, location, abundance, and color of redoximorphic features (if present). These characteristics were used as the basis for determining the presence or absence of hydric soil indicators as set forth in USACE (2012).

Determination of Wetland Hydrology

Wetland hydrology encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface at some time during the growing season (USACE 1987). Areas with evident wetland hydrology characteristics are those where the presence of water has an overriding influence on characteristics of vegetation and soils due to anaerobic and reducing conditions, respectively. In general, this can only occur in areas inundated or saturated within 12 inches (30.5 centimeters) of the surface continuously for at least five percent of the growing season in most years (50 percent probability of recurrence) (USACE 1987).

Field verification of wetland hydrology involved positive field observation of at least one primary indicator, or two secondary indicators as defined in USACE (2012).

3.2.1.2 Non-wetland Waters of the United States

Potential non-wetland waters of the U.S. were surveyed for in accordance with the guidelines set forth by USACE (2005). The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark, in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the ordinary high water mark to the limits of the adjacent wetlands. All non-wetland waters of the U.S. mapped in the study area were long-established drainage ditches.

3.2.2 Photographic Documentation

Representative photographs of the upland, wetland, and ditch areas are included in Appendix C.

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CHAPTER 4
RESULTS

Results of the wetland delineation are detailed in Table 3 and are shown in Figures 8–11, Appendix A. In total, approximately 22.96 acres of wetlands and 16.25 acres of drainage ditches were delineated within the study area. Indicators of hydrophytic vegetation, wetland hydrology, and hydric soil for the wetland habitats that were delineated in the study area are provided on data sheets in Appendix B.

Table 3 Jurisdictional Delineation Results

Wetland ID	Classification*	Acres	Hectares	Jurisdictional (Yes/No)
1	PEM/PSS	0.39	0.16	Yes
2	PEM/PSS	8.27	3.35	Yes
3	PEM/PSS	0.04	0.02	Yes
4	PEM/PSS	0.23	0.09	Yes
5	PEM/PSS	0.06	0.03	Yes
6	PEM/PSS	0.70	0.28	Yes
7	PEM/PSS	1.39	0.56	Yes
8	PEM/PSS	0.10	0.04	Yes
9	PEM/PSS	0.06	0.02	Yes
10	PEM/PSS	0.11	0.05	Yes
11	PEM/PSS	0.39	0.16	Yes
12	PEM/PSS	0.32	0.13	Yes
13	PEM/PSS	0.02	0.01	Yes
14	PEM/PSS	0.14	0.06	Yes
15	PEM/PSS	0.05	0.02	Yes
16	PEM/PSS	0.08	0.03	Yes
17	PEM/PSS	10.60	4.29	Yes
	Subtotal	***22.96***	***9.30***	
Ditches	PUB3F/Hd	16.25	6.58	Yes
	TOTAL	**39.21**	**15.88**	

Notes: *PEM = Palustrine emergent wetland, PSS = Palustrine scrub shrub wetland; PUB3F/Hd = Palustrine unconsolidated bottom, mud, semi-permanently flooded/permanently flooded, partly drained/ditched.

All the wetlands and other waters of the U.S. (ditches) should be considered jurisdictional for planning purposes. The wetlands appear to be hydrologically connected to the ditches, with water likely flowing back and forth between the ditches and wetlands. Additionally, per the desktop analysis, the ditches were likely excavated/created in historic wetland areas and the ditches eventually drain to the Pacific Ocean.

Vegetation diversity in the mapped wetlands was low and nearly homogeneous. The dominant plant species within all the mapped wetlands was the emergent wetland plant sea purslane (*Sesuvium portulacastrum*), while the boundaries of nearly all of the wetlands were dominated by the scattered shrub camphorweed (*Pluchea indica)* (see typical photos in Appendix C).

The primary indicator of wetland hydrology observed in the mapped wetlands was Saturation (Indicator Code A3). Additionally, Sediment Deposits (Indicator Code B2), Surface Soil Cracks (Indicator Code B6), and Salt Deposits (Indicator Code C5) were common and noted.

The soils observed within the mapped wetland habitats met the qualifications for at least one of the field indicators of hydric soils. The majority of hydric soils in the mapped wetlands displayed a matrix with low chroma (2 or less) with a value of 4 or more with a Depleted Matrix (Indicator Code F3).

All the ditches in the study area are clearly defined, linear, open water areas and vary in width from approximately 10 to 30 feet (3 to 9 meters). As the historic mapping in Figure 7 (Appendix A) indicates, the study area was likely an historic complex of wetlands and ponds. Therefore, the excavation of the original ditch network was likely in a wetland complex, and because the ditch network drains to the Pacific Ocean, they should be considered jurisdictional for planning purposes.

The Cowardin classification of the wetlands is Palustrine Emergent (PEM) and Palustrine Scrub Shrub (PSS), and the classification of the ditches is Palustrine Unconsolidated Bottom, Mud, Permanently or Semi-permanently Flooded, Partially Ditched/Drained (PUB3F/Hd).

CHAPTER 5 CONCLUSION

Based on the results of the wetland delineation, there are 17 individual PEM/PSS wetlands in the study area, comprising approximately 22.96 acres, which exhibited the necessary parameters to be considered jurisdictional wetlands and 16.25 acres of ditches that should be considered potential waters of the U.S. (see Table 3 and Figures 8–11 in Appendix A).

The USACE, under the authority of Section 404 of the CWA and Section 10 of the Rivers and Harbors Act, has the authority to make the final determination of the jurisdictional status and extent of waters of the U.S., including wetlands, within the study area. This report represents the best scientific judgement and opinions of the Stantec biologists that conducted the delineation and should be considered preliminary until concurrence has been obtained from the USACE Honolulu District in the form of a Jurisdictional Determination.

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CHAPTER 6 REFERENCES

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Appendix A
Figures

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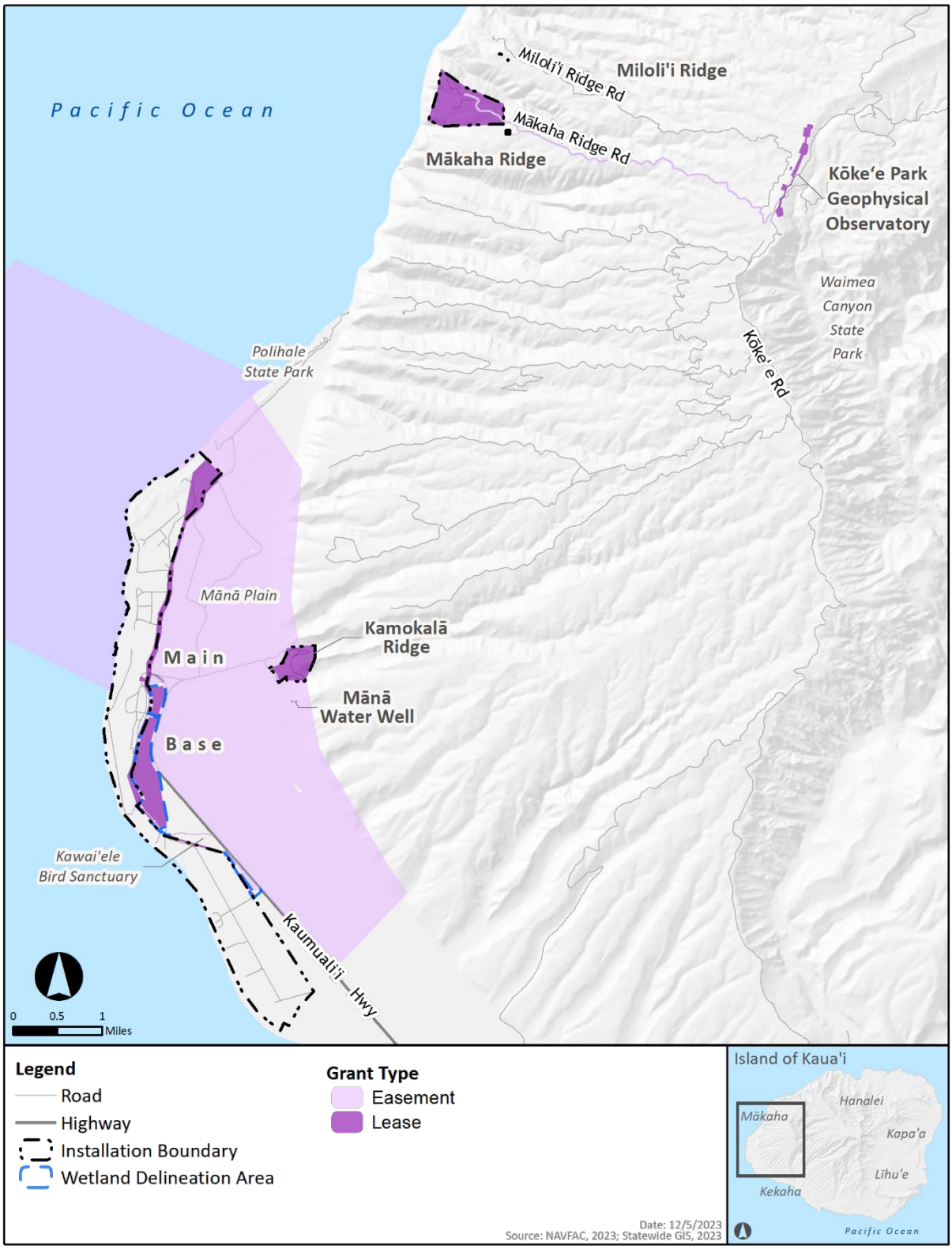

Figure 1 PMRF Lease Areas Map

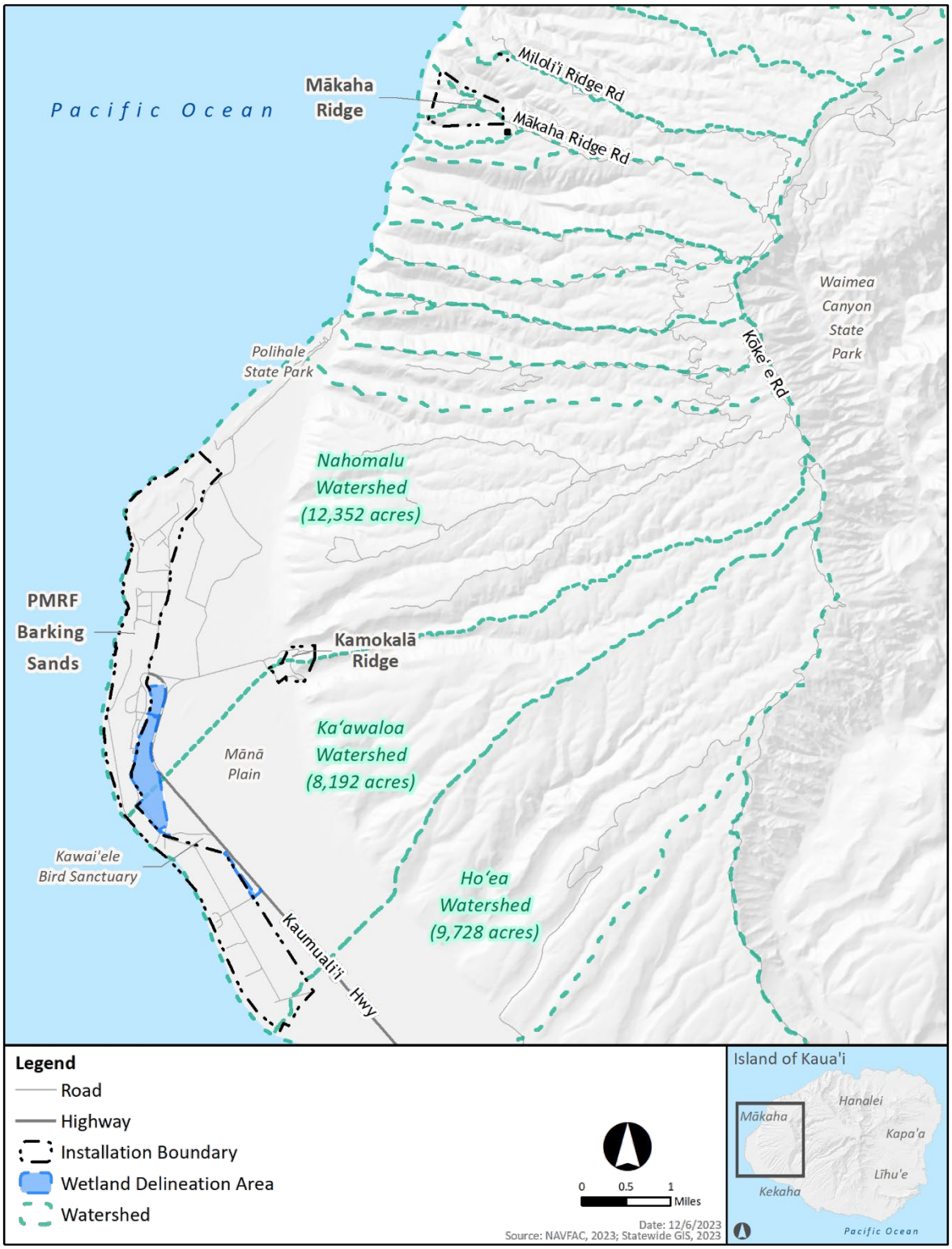

Figure 2 Wetland Delineation Study Area Map

Figure 3 Wetland Delineation NWI Wetlands Map

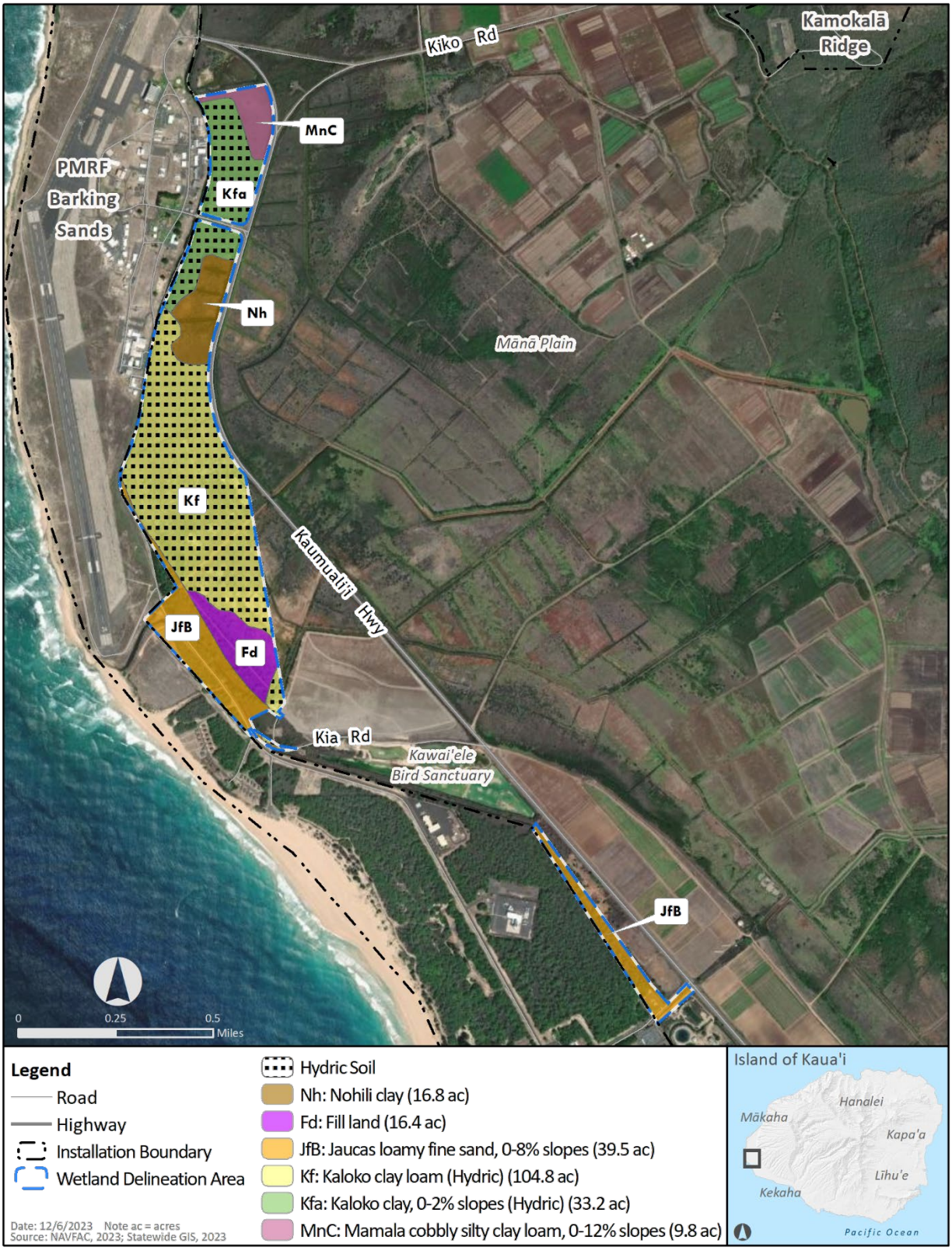

Figure 4 Wetland Delineation NRCS Soils and Hydric Soils Map

Figure 5 Wetland Delineation USGS Topographic Map

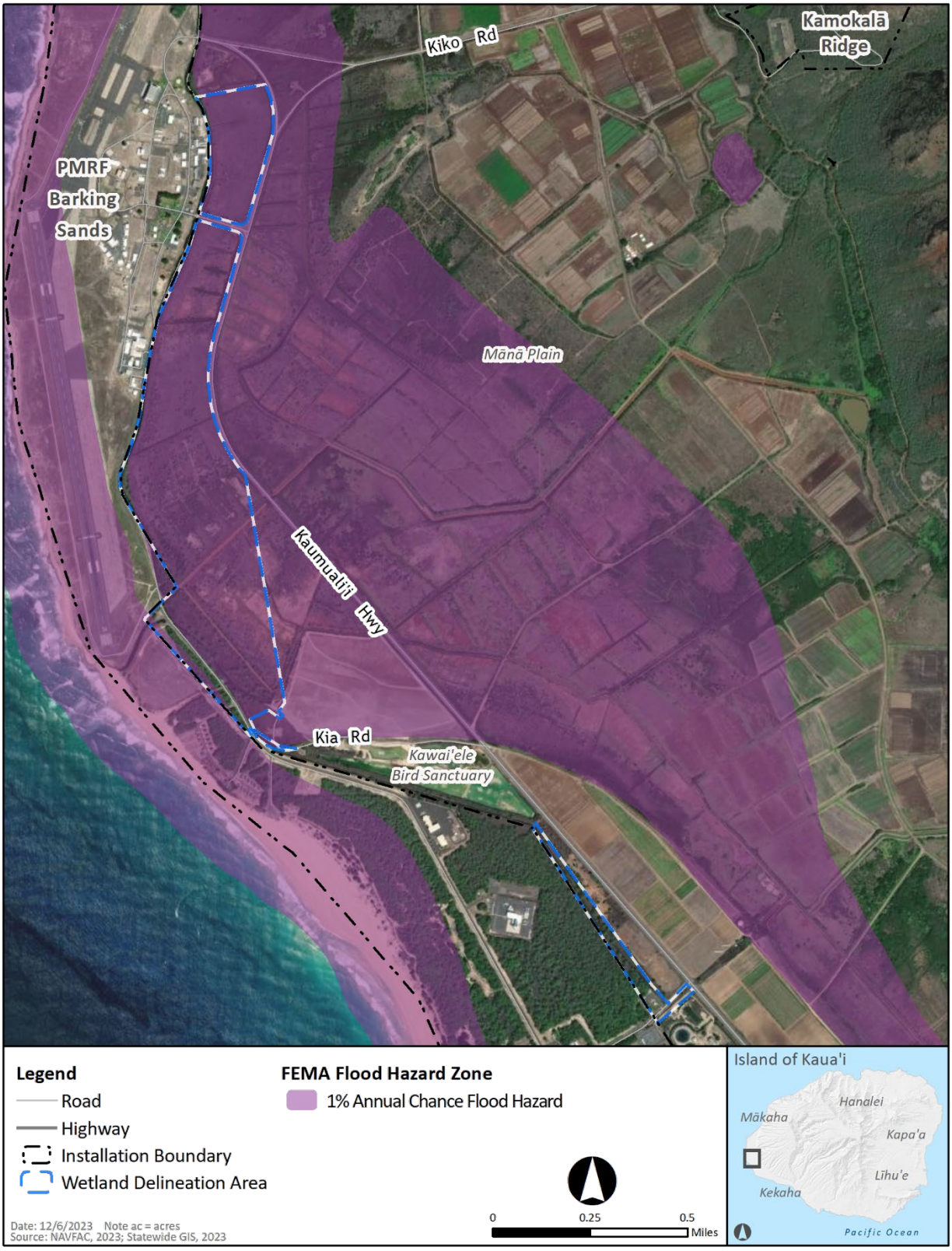

Figure 6 Wetland Delineation FEMA Map

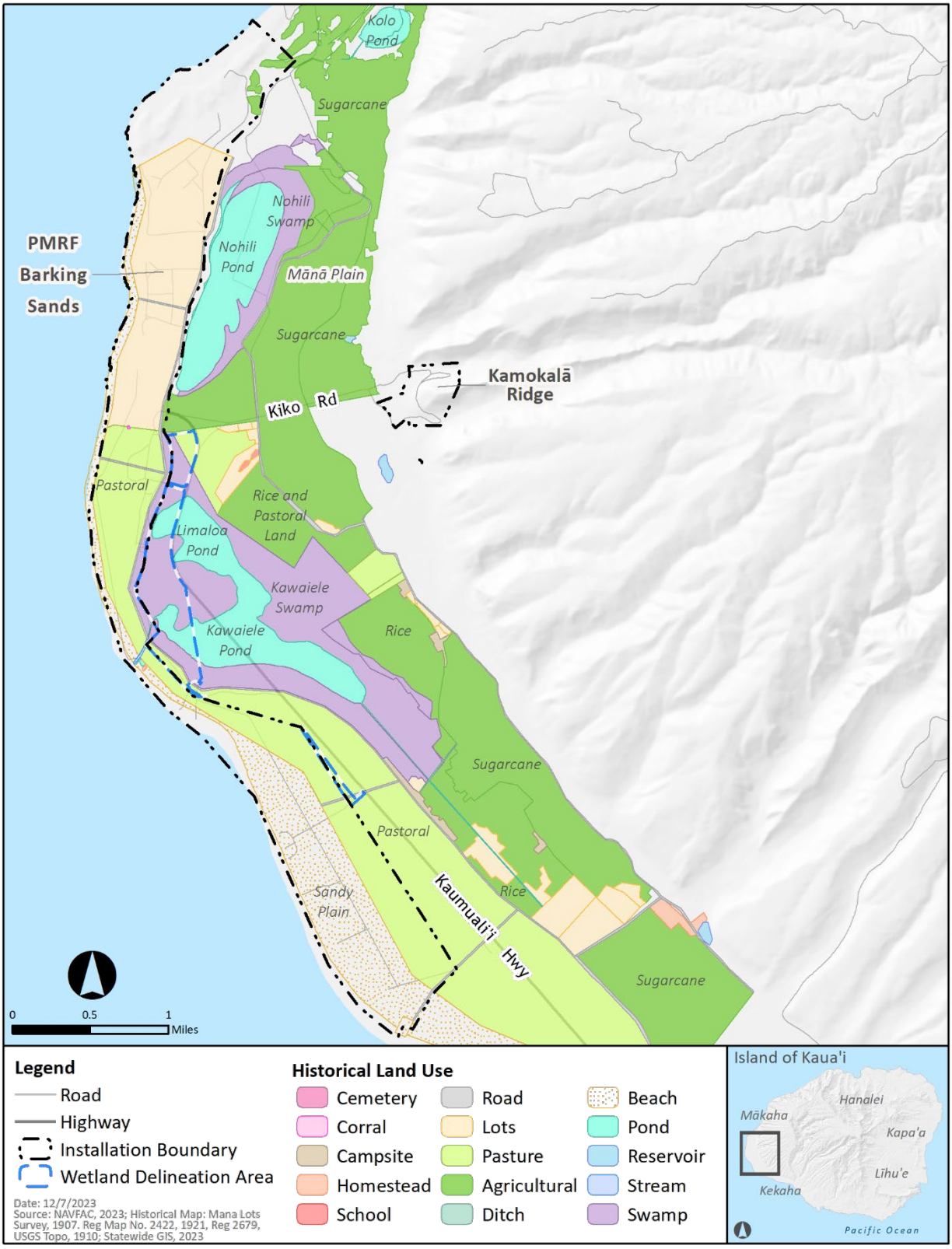

Figure 7 1907 and 1921 Historical Land Use Map

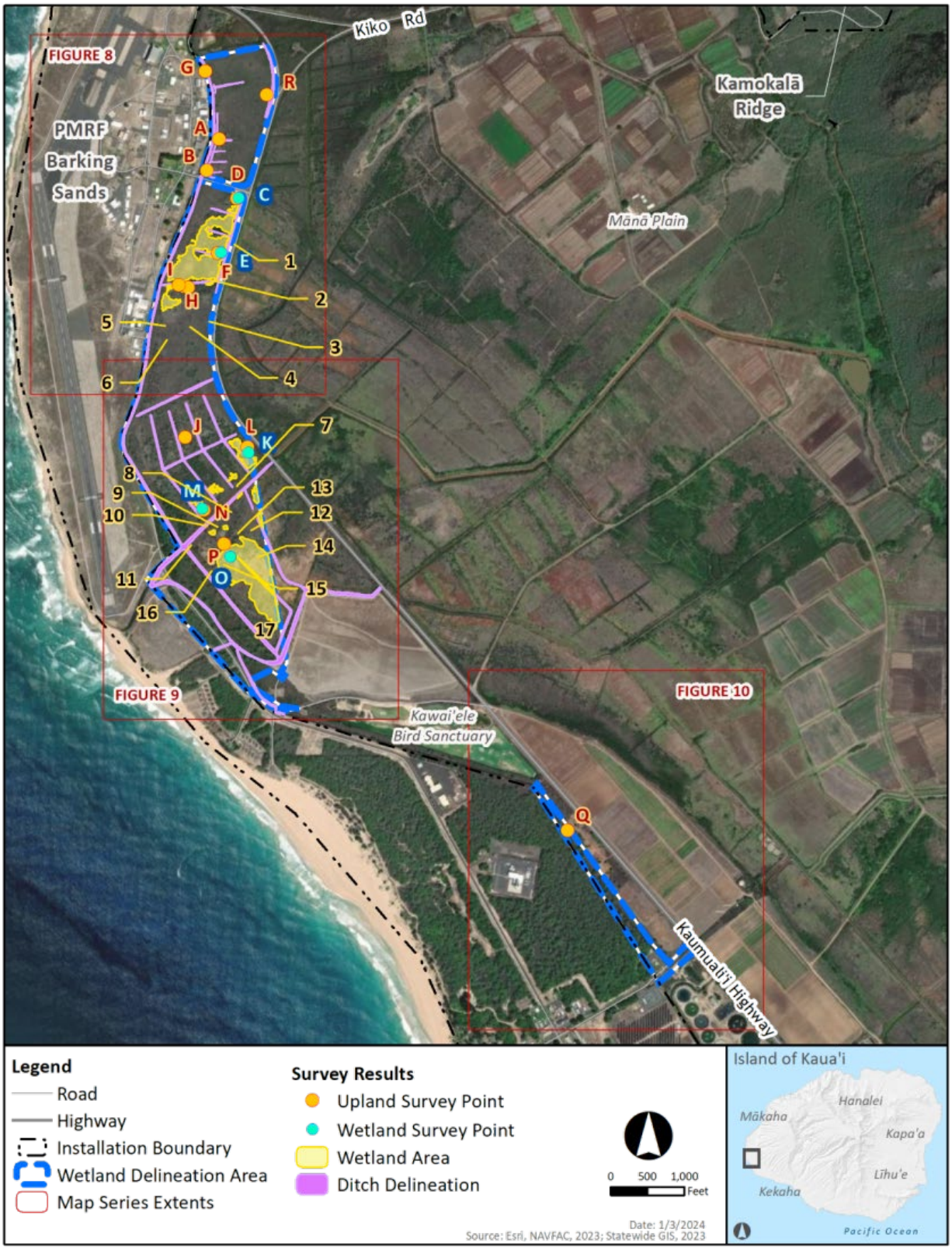

Figure 8 Wetland Delineation Survey Overview

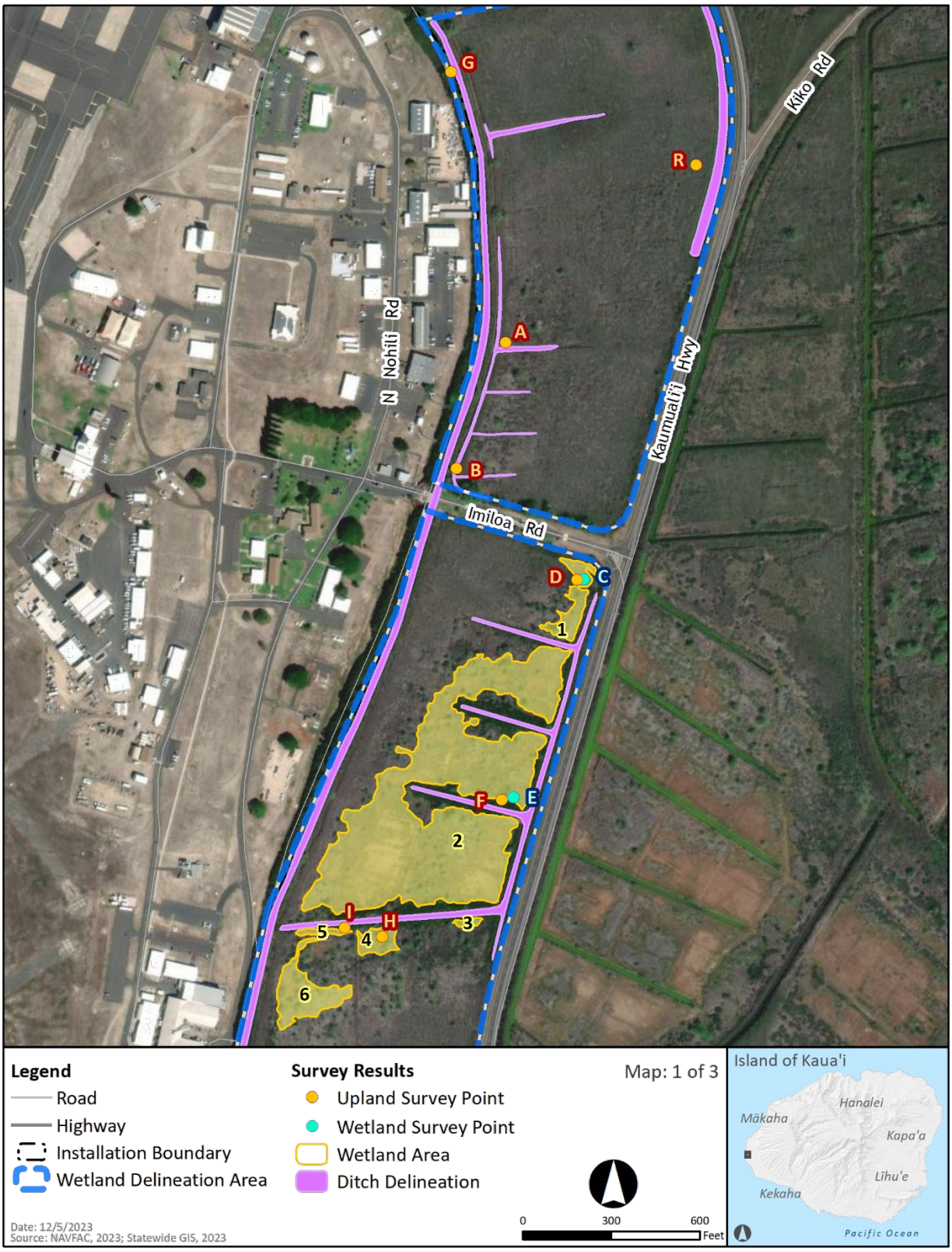

Figure 9 Wetland Delineation Survey 1 of 3

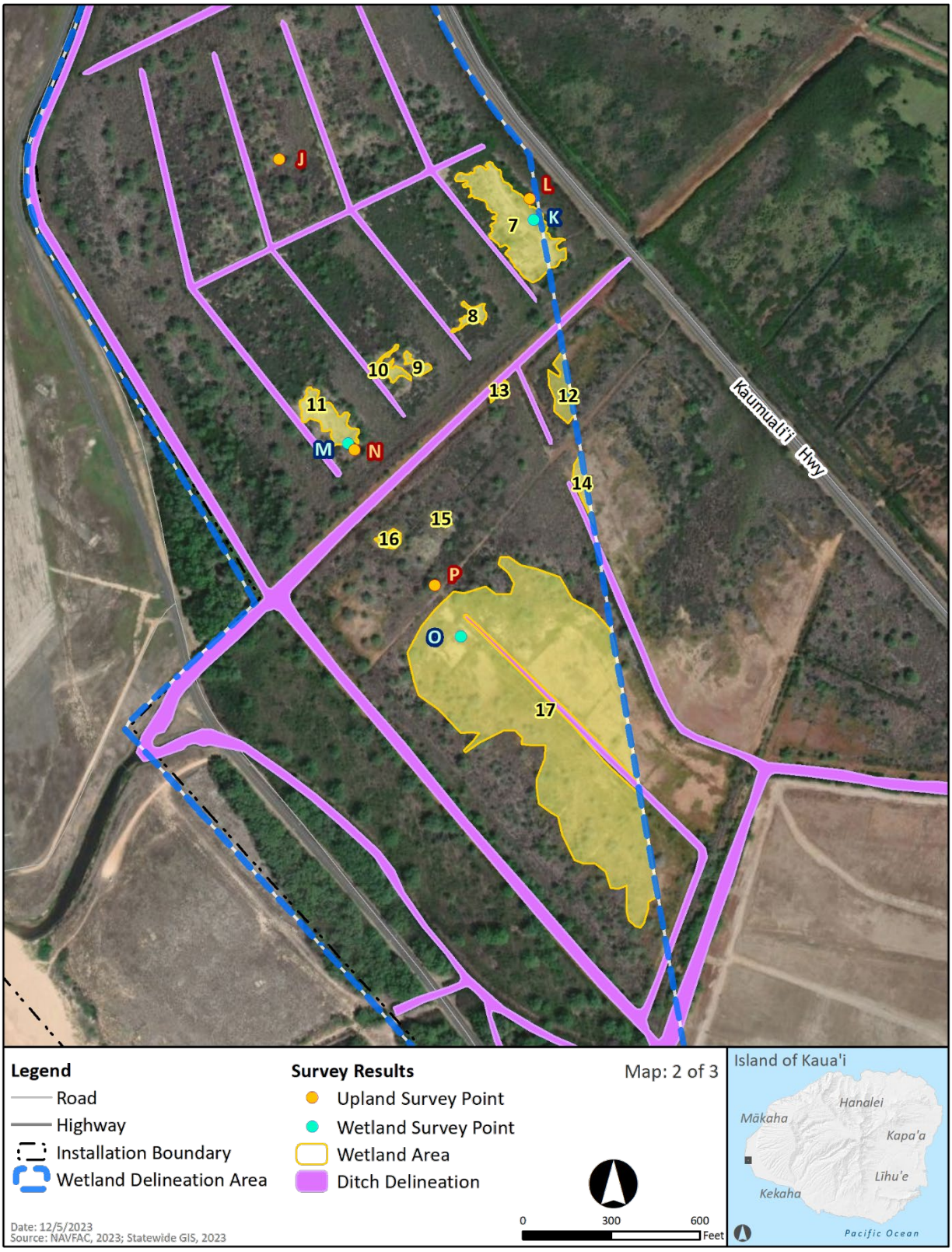

Figure 10 Wetland Delineation Survey 2 of 3

Figure 11 Wetland Delineation Survey 3 of 3

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Appendix B
Data Sheets

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 11:17
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: A
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
Terrace above/adjacent to agriculture ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. *Pluchea indica*	15	Yes	FAC
2. *Leucaena leucocephala*	10	Yes	UPL
3.			
4.			
5.			
	25	=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Megathyrsus maximus*	95	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals:	120 (A)		380 (B)

Prevalence Index = B/A = 3.17

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

SOIL

Sampling Point: A

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 14:10
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: B
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): slope Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 20
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Slope above agricultural ditch channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

Sapling/Shrub Stratum (Plot size: 3m radius)			
1. *Pluchea indica*	40	Yes	FAC
2. *Leucaena leucocephala*	25	Yes	UPL
3. *Pluchea carolinensis*	2	No	FAC
4.			
5.			
	67	=Total Cover	

Herb Stratum (Plot size: 1 m radius)			
1. *Heliotropium curassavicum*	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5	=Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	47	x 3 =	141
FACU species	0	x 4 =	0
UPL species	25	x 5 =	125
Column Totals:	72 (A)		266 (B)
Prevalence Index = B/A =			3.69

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

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SOIL

Sampling Point: B

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-14	7.5YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 15:25
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: C
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): slightly concave
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Depressional wetland with large areas devoid of vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Sesuvium portulacastrum*	60	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		180 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

SOIL

Sampling Point: C

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	5YR 3/1	100					Muck	
2-4	7.5YR 3/3	100					Loamy/Clayey	
4-12	7.5YR 3/4	100					Loamy/Clayey	
12-18	5YR 4/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- X Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/3/2023 Time: 8:11
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: D
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland terrace adjacent to wetland area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

Sapling/Shrub Stratum (Plot size: 3x1m)			
1. *Pluchea indica*	70	Yes	FAC
2.			
3.			
4.			
5.			
	70	=Total Cover	

Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
		=Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		210 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

SOIL

Sampling Point: D

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4	7.5YR 3/2	100					Loamy/Clayey	
4-16	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
? Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/3/2023 Time: 9:46
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: E
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): slightly concave
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

Herb Stratum (Plot size: 1m radius)			
1. *Sesuvium portulacastrum*	80	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80	=Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	80 (A)		240 (B)
Prevalence Index = B/A =			3.00

Hydrophytic Vegetation Indicators:

____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: E

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	5YR 3/1	100					Muck	
2-16	7.5YR 3/3	100					Mucky Loam/Clay	
16-24	10R 6/2	70	7.5YR 6/8	30	C	M	Mucky Loam/Clay	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- X Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/3/2023 Time: 10:00
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: F
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): slope Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 5
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Upland adjacent to ditch and palustrine emergent wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	

Sapling/Shrub Stratum (Plot size: 3x1 m)			
1. *Pluchea indica*	90	Yes	FAC
2.			
3.			
4.			
5.			
	90	=Total Cover	

Herb Stratum (Plot size: 1x1 m)			
1. *Sesuvium portulacastrum*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20	=Total Cover	

Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	2	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		330 (B)
Prevalence Index = B/A =			3.00

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: F

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5	7.5YR 3/2	100					Loamy/Clayey	
5-16	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/3/2023 Time: 11:47
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: G
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Terrace above ditch channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Syzygium cumini*	25	Yes	FAC
2.			
3.			
4.			
5.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m radius)			
1. *Leucaena leucocephala*	40	Yes	UPL
2. *Pluchea carolinensis*	20	Yes	FAC
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Cenchrus ciliaris*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	15	x 4 =	60
UPL species	40	x 5 =	200
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
____ 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

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SOIL

Sampling Point: G

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/3/2023 Time: 12:48
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: H
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Sesuvium portulacastrum*	95	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	95	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	95	x 3 =	285
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	95 (A)		285 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

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SOIL Sampling Point: H

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-9	7.5YR 3/3	100					Loamy/Clayey	
9-16	10R 6/2	85	7.5YR 6/8	15	C	M	Mucky Loam/Clay	Prominent redox concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/3/2023 Time: 1:00
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: I
Investigator(s): Scheuerman, De Guzman TMK/Parcel:
Landform (hillside, coastal plain, etc.): hillslope Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 5
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Slope of channelized ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	____ =Total Cover		
Sapling/Shrub Stratum (Plot size: 3x1 m)			
1. *Pluchea indica*	100	Yes	FAC
2.			
3.			
4.			
5.			
	100 =Total Cover		
Herb Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	____ =Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ =Total Cover		

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	100	x 3 =	300
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	100 (A)		300 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

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SOIL

Sampling Point: I

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/3	100					Loamy/Clayey	sandy

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? Yes ____ No X Depth (inches): ____
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrolgy.

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/4/2023 Time: 9:08
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: J
Investigator(s): Scheuerman, De Guzman, Chaplin TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Terrace area adjacent to and above channelized ditch system.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 3x1 m)			
1. *Pluchea carolinensis*	15	Yes	FAC
2. *Pluchea indica*	5	Yes	FAC
3.			
4.			
5.			
	20	=Total Cover	
Herb Stratum (Plot size: 1x1 m)			
1. *Atriplex semibaccata*	20	Yes	FAC
2. *Sesuvium portulacastrum*	10	No	FAC
3. *Chloris barbata*	35	Yes	FACU
4.			
5.			
6.			
7.			
8.			
	65	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	50	x 3 =	150
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	85 (A)		290 (B)

Prevalence Index = B/A = 3.41

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: J

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology.

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/5/2023 Time: 8:30
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: K
Investigator(s): Scheuerman, Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): slightly concave
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Depressional area, similar to other wetlands in the area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 1x1 m)			
1. *Sesuvium portulacastrum*	60	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		180 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: K

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1	5YR 3/1	100					Muck	
1-10	7.5YR 3/3	100					Loamy/Clayey	
10-16	10R 6/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
X Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
X Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 10
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 8

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/5/2023 Time: 8:45
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: L
Investigator(s): Scheuerman, Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prosopis pallida*	40	Yes	FACU
2.			
3.			
4.			
5.			
	40	=Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m radius)			
1. *Pluchea indica*	75	Yes	FAC
2. *Pluchea carolinensis*	10	No	FAC
3.			
4.			
5.			
	85	=Total Cover	
Herb Stratum (Plot size: 1 m radius)			
1. *Sesuvium portulacastrum*	20	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	20	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	105	x 3 =	315
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	145 (A)		475 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:
____ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
____ 3 - Prevalence Index is ≤3.0[1]
____ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: L

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5YR 3/3						Loamy/Clayey	sandy

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology.

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/5/2023 Time: 9:34
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: M
Investigator(s): Scheuerman, Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): slightly concave
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes X** **No ____**
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Depressional wetland, similar to other wetlands in the area.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 1 m radius)			
1. *Sesuvium portulacastrum*	70	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	70	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	70	x 3 =	210
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	70 (A)		210 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X** **No ____**

Remarks:

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SOIL

Sampling Point: M

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 3/2	92	2.5YR 5/6	8	C	M	Loamy/Clayey	Prominent redox concentrations
10-12	10R 6/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- X Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ___ Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- X Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ___ Depth (inches): ___
Water Table Present? Yes ___ No ___ Depth (inches): ___
Saturation Present? Yes ___ No ___ Depth (inches): ___
(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Surface soil cracks, sparse vegetation, and salt deposits are consistent with other similar wetlands in the area.

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 6/5/2023 Time: 9:52
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: N
Investigator(s): Lowenthal, Scheuerman, De Guzman, Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5 m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Prosopis pallida*	20	Yes	FACU
2.			
3.			
4.			
5.			
	20	=Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m radius)			
1. *Pluchea indica*	15	Yes	FAC
2.			
3.			
4.			
5.			
	15	=Total Cover	
Herb Stratum (Plot size: 1 m radius)			
1. *Atriplex semibaccata*	30	Yes	FAC
2. *Chloris barbata*	10	Yes	FACU
3.			
4.			
5.			
6.			
7.			
8.			
	40	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	30	x 4 =	120
UPL species	0	x 5 =	0
Column Totals:	75 (A)		255 (B)
Prevalence Index = B/A =			3.40

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

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SOIL

Sampling Point: N

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/2	100					Loamy/Clayey	sandy

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): ____
Water Table Present? Yes ____ No X Depth (inches): ____
Saturation Present? Yes ____ No X Depth (inches): ____
(includes capillary fringe)

Wetland Hydrology Present? **Yes** ____ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
No indicators of wetland hydrology.

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 15:25
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: O
Investigator(s): Lowenthal Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): depression Local relief (concave, convex, none): slightly concave
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Depressional wetland with large areas devoid of vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Sesuvium portulacastrum*	60	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	60	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	60 (A)		180 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
X 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:

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SOIL

Sampling Point: O

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2	5YR 3/1	100					Muck	
2-5	7.5YR 3/2	100					Loamy/Clayey	
5-12	7.5YR 3/1	100					Loamy/Clayey	
12-18	5YR 4/1	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Muck Presence (A8)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
- ___ Dark Surface (S7)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ? Stratified Layers (A5)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Tilapia Nests (B17)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- X Thin Muck Surface (C7)
- ___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- X Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

ENG FORM 6116-6, JUL 2018 Hawai'i and Pacific Islands – Version 2.0

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 11:47
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: Q
Investigator(s): Lowenthal Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Terrace above ditch channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Syzygium cumini*	25	Yes	FAC
2.			
3.			
4.			
5.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m radius)			
1. *Leucaena leucocephala*	40	Yes	UPL
2. *Pluchea carolinensis*	20	Yes	FAC
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Cenchrus ciliaris*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	15	x 4 =	60
UPL species	40	x 5 =	200
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

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SOIL

Sampling Point: Q

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 11:47
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: Q
Investigator(s): Lowenthal Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:
Terrace above ditch channel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Syzygium cumini*	25	Yes	FAC
2.			
3.			
4.			
5.			
	25	=Total Cover	
Sapling/Shrub Stratum (Plot size: 3 m radius)			
1. *Leucaena leucocephala*	40	Yes	UPL
2. *Pluchea carolinensis*	20	Yes	FAC
3.			
4.			
5.			
	60	=Total Cover	
Herb Stratum (Plot size: 1m radius)			
1. *Cenchrus ciliaris*	15	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	15	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	45	x 3 =	135
FACU species	15	x 4 =	60
UPL species	40	x 5 =	200
Column Totals:	100 (A)		395 (B)

Prevalence Index = B/A = 3.95

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:

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SOIL

Sampling Point: Q

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/4	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Hawai'i and Pacific Islands Region
See ERDC/EL TR-12-5; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: PMRF Land Lease EIS City: Kekaha Sampling Date: 10/2/2023 Time: 10:23
Applicant/Owner: U.S. Navy State/Terr/Comlth.: Hawai'i Island: Kauai Sampling Point: 1
Investigator(s): Scheuerman, Lowenthal, De Guzman, Gabitzer TMK/Parcel:
Landform (hillside, coastal plain, etc.): terrace Local relief (concave, convex, none): none
Lat: Long: Datum: Slope (%): 0
Soil Map Unit Name: NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
Terrace area adjacent to agriculture ditch.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
		=Total Cover	
Sapling/Shrub Stratum (Plot size: 3m radius)			
1. *Leucaena leucocephala*	50	Yes	UPL
2.			
3.			
4.			
5.			
	50	=Total Cover	
Herb Stratum (Plot size: 1 m radius)			
1. *Megathyrsus maximus*	75	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	75	=Total Cover	
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
		=Total Cover	

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	75	x 3 =	225
FACU species	0	x 4 =	0
UPL species	50	x 5 =	250
Column Totals:	125 (A)		475 (B)

Prevalence Index = B/A = 3.80

Hydrophytic Vegetation Indicators:
___ 1 - Rapid Test for Hydrophytic Vegetation
___ 2 - Dominance Test is >50%
___ 3 - Prevalence Index is ≤3.0[1]
___ Problematic Hydrophytic Vegetation[1] (Explain)
[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

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SOIL Sampling Point: 1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-16	7.5YR 3/2	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Muck Presence (A8)
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6) **(Guam, CNMI, and American Samoa)**
___ Dark Surface (S7)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

___ Stratified Layers (A5)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)
___ High Water Table (A2)
___ Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
___ Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
___ Water-Stained Leaves (B9)
___ Aquatic Fauna (B13)
___ Tilapia Nests (B17)
___ Hydrogen Sulfide Odor (C1)
___ Oxidized Rhizospheres on Living Roots (C3)
___ Presence of Reduced Iron (C4)
___ Recent Iron Reduction in Tilled Soils (C6)
___ Thin Muck Surface (C7)
___ Fiddler Crab Burrows (C10) **(Guam, CNMI, and American Samoa)**
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Dry-Season Water Table (C2)
___ Salt Deposits (C5)
___ Stunted or Stressed Plants (D1)
___ Geomorphic Position (D2)
___ Shallow Aquitard (D3)
___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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Appendix C
Site Photographs

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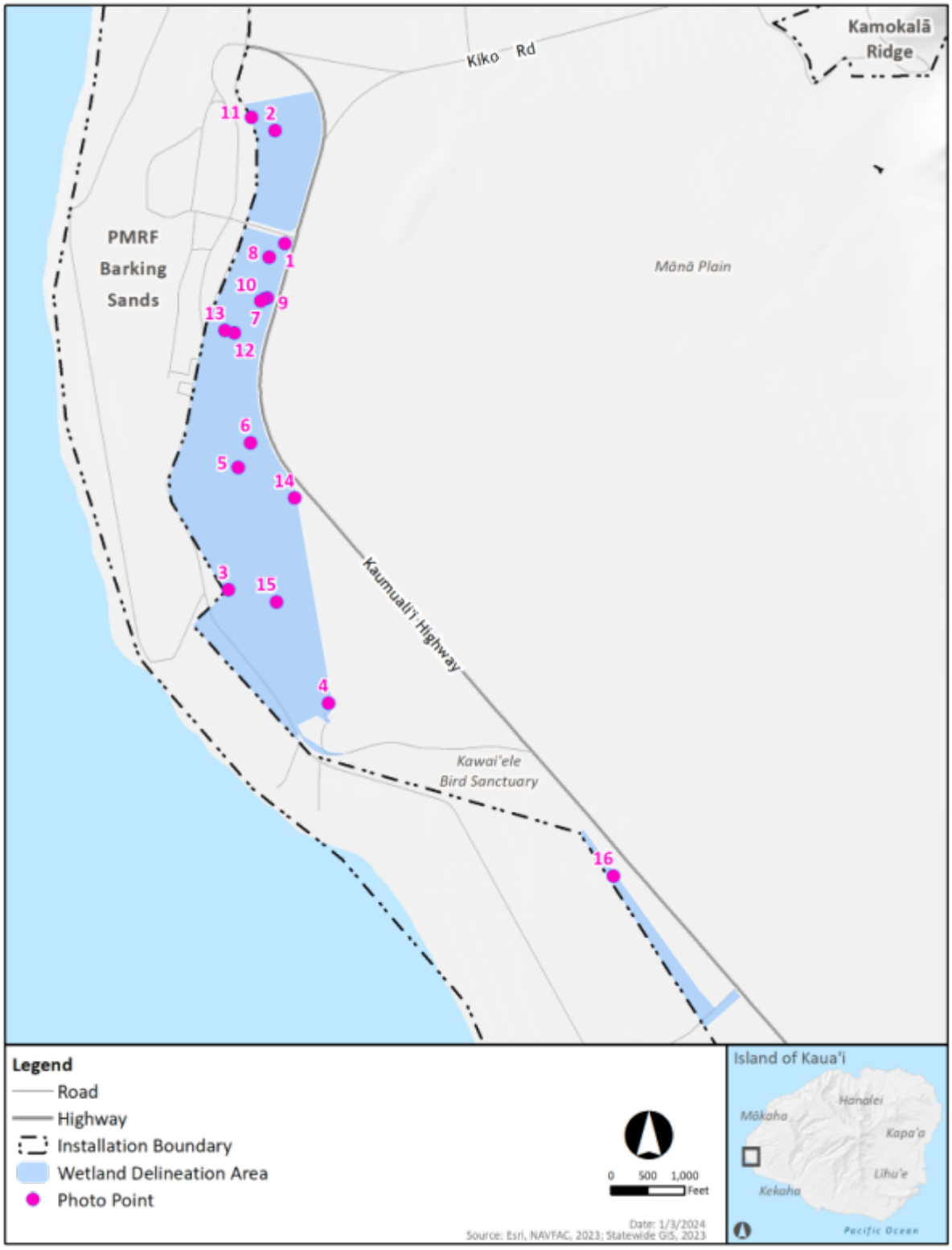

Figure 12 Location of Photo Points

Photo 1. Data Point C, Wetland

Photo 2. Smaller Ditch, Typical

Photo 3. Larger Ditch, Typical

Photo 4. Larger Ditch, Typical

Photo 5. Smaller Ditch, Typical

Photo 6. Smaller Ditch, Typical

Photo 7. Smaller Ditch, Typical

Photo 8. Smaller Ditch, Typical

Photo 9. Data Point E, Wetland

Photo 10. Data Point F, Upland

Photo 11. Data Point G, Upland

Photo 12. Data Point H, Upland

Photo 13. Data Point I, Upland

Photo 14. Data Point K, Wetland

Photo 15. Data Point O, Wetland

Photo 16. Data Point Q, Upland

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