PACIFIC MISSILE RANGE FACILITY LAND-BASED TRAINING AND TESTING

FINAL ENVIRONMENTAL ASSESSMENT

August 2025









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Final
Environmental Assessment
Pacific Missile Range Facility
Land-Based Training and Testing

Lead Agency:	United States Department of the Navy
Action Proponent:	Commander, United States Pacific Fleet
Cooperating Agency:	Missile Defense Agency
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Abstract

The United States Department of the Navy (Navy) prepared this Environmental Assessment (EA) to comply with the National Environmental Policy Act. In this EA, the Navy evaluates the potential environmental impacts of conducting land-based training and testing activities at launch areas and other locations under the authority of Pacific Missile Range Facility (PMRF).

The Study Area consists of lands within PMRF at Barking Sands, beginning at the high tide line and extending inland to the installation boundary, and Kaula[1] Island (an offshore islet where inert (non-explosive) gunnery and bombing exercises occur).

The Proposed Action, which is to continue previously analyzed land-based activities and conduct an increased number of land-based, multi-domain training and testing activities in the Study Area, is analyzed as the Preferred Alternative in this EA. The No Action Alternative, which is to continue ongoing levels of Navy-led training and testing activities at Barking Sands and Kaula Island, is also analyzed and would represent no change to ongoing training and testing activities within the Study Area.

The resources evaluated in this EA include air quality, greenhouse gases, noise, public health and safety, terrestrial biological resources, and cultural resources.

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[1] The Navy honors Native Hawaiian culture and respects the importance of diacritical marks in clarifying pronunciation and meaning in the Hawaiian language. However, to ensure compliance with Section 508 of the Rehabilitation Act and functionality of reading assistance technology, this document does not apply diacritical marks to text.

EXECUTIVE SUMMARY

ES.1 Proposed Action

ES.1.1 Introduction

The United States (U.S.) Department of the Navy (Navy), the lead agency and the real estate manager of lands under federal jurisdiction of the United States that comprise the Pacific Missile Range Facility (PMRF), has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) and the Department of Defense (DoD) NEPA Implementing Procedures released on June 30, 2025. For this EA, the Action Proponent is the Commander, U.S. Pacific Fleet. The Missile Defense Agency (MDA) is a Cooperating Agency because of its launch activities at PMRF. The U.S. Army (Army), U.S. Air Force (Air Force), and U.S. Marine Corps (Marine Corps) are participating in the development of this EA as additional training units.

ES.1.2 Background

Strategically situated in the Hawaiian Islands, PMRF provides integrated range services in a modern, dynamic, multi-domain environment that ensures the safe conduct and evaluation of training and research, development, test, and evaluation missions. Accordingly, training and testing activities have been conducted at PMRF for decades. PMRF has supported various missile test and evaluation programs that include target launches and flight tests of missile interceptors. The mission of PMRF is to oversee and coordinate training events from unit-level to multi-national exercises (including foreign militaries by invitation with Navy support) while simultaneously conducting and supporting research, development, test, and evaluation of Navy, DoD, and other federal agency programs and platforms. Activities conducted at PMRF are monitored with real-time tracking and command/control capabilities located at or connected to land-based PMRF facilities. PMRF 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 Barking Sands, and inert (non-explosive) air-to-surface gunnery and bombing exercises on Kaula Island. Kaula Island has been under federal jurisdiction since 1924 and used by the military for target practice since the 1950s. The Navy has used the island's 11-acre southern inert ordnance impact area for inert (non-explosive)-only target practice since at least 1981. Previous evaluation use of Kaula Island for this training was conducted in the Hawaii Range Complex Environmental Impact Statement in 2008 (U.S. Department of the Navy, 2008a, 2008b). The ability to conduct training and testing at Barking Sands and Kaula Island is vital to military readiness.

ES.1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide U.S. military services and MDA with land-based, multi-domain training and testing at a level that supports military readiness into the reasonably foreseeable future. The need for the Proposed Action is to ensure U.S. military services and MDA are able to organize, train, and equip service members and personnel to meet their respective national defense missions in accordance with their congressionally mandated requirements, as set forth in 10 United States Code (U.S.C.) Section 7062 (Army), 10 U.S.C. Section 8062 (Navy), 10 U.S.C. Section 8063 (Marine Corps), 10 U.S.C. Section 9062 (Air Force), and 10 U.S.C. Section 205 (MDA).

ES.1.4 Proposed Action

As a Major Range and Test Facility Base (commonly known as MRTFB), PMRF is part of the designated core set of DoD Test and Evaluation infrastructure and associated workforce components, which are

national assets that must be preserved 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 operations and Navy Fleet training.

PMRF has supported various missile test and evaluation programs that include target launches and flight tests of missile interceptors. The tempo and types of training and testing activities at PMRF have fluctuated over the years because of the introduction of new technologies, the evolving nature of international events, advances in training and warfighting doctrine and procedures, evolving joint exercise cycles, and changes in force structure (e.g., organization of ships, weapons, and personnel). Such developments influence the frequency, duration, intensity, and location of required training and testing activities at PMRF.

The Proposed Action is to continue to conduct land-based, multi-domain training and testing activities to support military training readiness at launch areas and other locations within the existing PMRF footprint, which includes the Main Base (hereinafter referred to as Barking Sands) and Kaula Island. The Proposed Action also includes increases in training and testing activities conducted by the Army, Air Force, Marine Corps, and MDA. Training and testing activities may also include the participation of foreign militaries by invitation with Navy support. No new types of training and testing activities are being proposed at Barking Sands or Kaula Island; all activities included in the Proposed Action have been previously conducted there at some point over the past 20 years and have been analyzed in relevant environmental documentation.

In developing the Proposed Action, the Navy engaged with the Army, Air Force, Marine Corps, and MDA to identify training and testing activities that were not being supported at other locations and for which PMRF was already supporting due to the availability of facilities and range assets. These activities were then assessed based on increased tempo requirements against factors of safety, range capability, and capacity given current operational and testing scheduling and deconfliction. Based on this assessment, the Navy determined the tempo of training and testing activities that PMRF could support into the reasonably foreseeable future. The tempo under the Proposed Action is the minimum necessary for the services to fulfill their Title 10 responsibilities. It is for these reasons that no other action alternative was carried forward for analysis. This EA reflects the most up-to-date compilation of land-based training and testing activities deemed necessary to accomplish military readiness requirements.

ES.1.5 Summary of Alternatives Considered but Eliminated

Alternatives eliminated from further consideration included alternative training and testing locations, eliminating military training activities on Kaula Island, and simulated training and testing. No other location matches the attributes necessary to support effective training and testing, which includes proximity to region of Hawaii Homeport and Service Commands, access to shore-based facilities, suitable facilities for military families, and optimal environmental conditions. Kaula Island is a contingency location for Navy units and is strategically important for Army and Air Force as a primary site for maritime-based and joint long-range fires training activities; as such, eliminating Kaula Island from military training does not meet the purpose and need of the Proposed Action. Simulation that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action due to its significant limitations. As such, the Navy determined that these alternatives did not meet the purpose of and need for the Proposed Action.

ES.2 Summary of Environmental Resources Evaluated in the Environmental Assessment

NEPA specifies that an EA should address those resources potentially subject to adverse effects. In addition, the level of analysis should be commensurate with the anticipated level of environmental effects. The following resource areas have been addressed in this EA: air quality, greenhouse gases, noise, public health and safety, terrestrial biological resources, and cultural resources.

ES.3 Summary of Potential Environmental Consequences of the Alternatives and Major Mitigating Actions

Table ES-1 provides a summary of the potential impacts on resource areas from each of the alternatives analyzed.

ES.4 Public Involvement

The Draft EA was released for a 30-day public review on August 30, 2024. The Navy informed the public of the Proposed Action and the potential environmental impacts through a Notice of Availability published in *The Garden Island* and the *Honolulu Star-Advertiser*. The notices included information about the availability of the Draft EA for public review and comment; physical and electronic locations where the public can access the Draft EA; date, time, and location of the public meeting; and how to submit comments on the Draft EA.

The Navy received a total of 1,889 comment letters, form letters, and emails from agencies, organizations, elected officials, and the public during the public commenting period. Each comment was reviewed and categorized into specific topics representing the general issues or concerns expressed during the public review and comment period. Substantive public comments and responses are documented in Appendix D (Public Comments and Responses). The Navy considered these comments in the Final EA and conducted additional engagement with community groups, Native Hawaiian Organizations (NHOs), and elected officials. These engagements included a Congressional Delegation brief in October 2024, a meeting with the Kauai Port Allen Fishermen's Association in February 2025, a meeting with the Office of Hawaiian Affairs in March 2025, and multiple meetings with NHOs and the Hawaii State Historic Preservation Division since November 2025 to discuss potential impacts and gather feedback on the Proposed Action.

Table ES-1: Summary of Potential Impacts on Resource Areas

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	Kaula Island
Air Quality	There would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas as previously analyzed in relevant environmental documentation. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training and testing areas. Therefore, no increases in air quality impacts from activities would occur.	Vehicle operations, aircraft, launch activities, generators, and personnel movement between training and testing areas associated with the Proposed Action would generate emissions; however, the emissions would not result in a significant change from the environmental baseline and would have minor impacts on the ambient air quality of the region. Due to the relatively low criteria pollutant and HAP emissions, the infrequent occurrence of emissions, and the distance to downwind human sensitive receptors, these emissions are not expected to interfere with the attainment of AAQS or cause any discernable increase to human health risks from HAP exposure in areas where public presence is expected. The state of Hawaii is designated as being in attainment for all criteria pollutants and therefore does not require a general conformity determination. As such, impacts on air quality would be less than significant.	GUNEX and BOMBEX activities associated with the Proposed Action would generate aircraft emissions. However, the emissions would not result in a significant change from the environmental baseline and would have minor impacts on the ambient air quality of the region. Due to the relatively low criteria pollutant and HAP emissions and infrequent occurrence, these emissions are not expected to interfere with the attainment of AAQS. Additionally, Kaula is uninhabited by humans, and no human sensitive receptors are near the vicinity. Thus, emissions would not contribute to human health risks from HAP exposure. The state of Hawaii is designated as being in attainment for all criteria pollutants and therefore does not require a general conformity determination. As such, impacts on air quality would be less than significant.
Greenhouse Gases	There would be no change from current levels of Navy-led training and testing activities and these activities would continue to occur within the same designated areas as previously analyzed in relevant environmental documentation. Proposed increases in land-based training and testing activities	The Proposed Action would increase GHG emissions by 7,602 MT of CO_2e per year as compared to the No Action Alternative. The increase in GHG emissions is conservatively estimated assuming all activities would occur within the same year at their highest average tempo and maximum number of personnel. The increase in GHG emissions is equivalent to approximately 0.00001 percent of the global GHG emissions, approximately 0.0001 percent of the reported U.S. emissions in 2021, and	Due to the comprehensive nature of the analysis and region of influence, impacts from the Proposed Action on GHGs resulting from activities conducted at Kaula are not meaningfully different than those analyzed at Barking Sands. Therefore, greenhouse impacts would be less than significant.

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	Kaula Island
	would not occur, and there would be no change in designated training and testing areas. Therefore, no additional impacts on greenhouse gases would occur.	approximately 0.03 percent of the 2019 GHG emissions reported for Kauai County. Expected GHG emissions are relatively minor and make up a negligible percentage of the global GHG emissions. Therefore, greenhouse impacts would be less than significant as a result of implementation of the Proposed Action.	
Noise	There would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training and testing areas. Current noise levels would remain the same with no increase. Noise would continue to be sporadic and intermittent across all training and testing locations. Therefore, no significant impacts on noise would occur.	Under the Proposed Action, activities that could generate noise include those that would use military vehicles and equipment, such as missile launcher setup, aircraft operations conducted in association with FARP and LZ activities, C5ISRT setup activities, and large unit bivouacking. These activities could create temporary increases in noise levels that would quickly attenuate with increasing distance. The nearest human sensitive noise receptors are residences, located approximately 10,000 feet (about 2 miles) south of the western edge of Barking Sands. Due to this distance, noise from almost all land-based training and testing activities, even with an increase in training and testing, is anticipated to be inaudible and would not meaningfully change DNL near human sensitive noise receptors. Proposed increases in training and testing activities would not result in an appreciable increase in noise levels in the vicinity of human sensitive noise receptors or the general public. Therefore, noise impacts would be less than significant.	Under the Proposed Action, GUNEX and BOMBEX training utilizing aircraft would continue to be conducted at Kaula Island. Inert munitions impact, weapons firing, and aircraft noise would be the primary noise sources during these activities; however, noise generated from inert munitions impacts would be minimal since there would not be an associated explosion, and there are no human sensitive noise receptors on the island. Thus, there would be no potential for degradation of the human noise environment, and noise impacts would be less than significant.
Public Health and Safety	There would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur	Potential public health and safety hazards on Barking Sands consists of EMR associated with radars and explosive safety associated with launch and firing activities. Under the Proposed Action, there would be no changes in the type of land-	Kaula Island is uninhabited by humans, and the public is restricted from accessing the island. Under the Proposed Action, standard operating procedures, such as the issuance of a Local Notice to Mariners and a Notice to Airmen, and

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	Kaula Island
	within the same designated areas previously analyzed in relevant environmental documentation. Proposed increases in land-based training and testing would not occur, and there would be no change in designated training and testing areas. Public health and safety risk would remain the same as currently. At present there is low risk to public health and safety. PMRF has not experienced a reportable major, work-related, ground incident in over 10 years. Given the historical data related to limited incidents creating low probability of elevated risk to public health and safety, no significant impacts on public health and safety would occur.	based training and testing activities that currently occur at Barking Sands, although the number of activities may increase. Each activity would still receive the same amount of attention and fall under the same SOPs as current activities—regardless of the service conducting the training or testing. Based on the adherence to established procedures, increasing activity would not increase risk to public health and safety. Proposed increases in activities would not pose any increased risks to military personnel or the general public. Therefore, public health and safety impacts would be less than significant.	verification that the range is clear of non-participants before initiating any potentially hazardous activity prior to any training event, would continue to be implemented. Public health and safety impacts would be less than significant. The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. The proposed revision would open the waters within a three-nautical-mile radius of the island, with restrictions only occurring during active training activities.
Terrestrial Biological Resources	There would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation. Impacts on terrestrial biological resources	• Vegetation. Damage to vegetation from movement of personnel, vehicles, and equipment across the beach and into upland areas during Amphibious Warfare Training is not likely since the movement would be limited to existing routes that are regularly used for this activity. Damage to vegetation from other activities such as bivouacking and ground maneuvers is also unlikely since troops would stay within previously disturbed	• Vegetation. Although inert weapons lack ignition or explosive capabilities, their impact and potential ricochets can, on exceedingly rare occasions, generate sparks leading to vegetation fires. Nevertheless, potential vegetation impacts would be less than significant because the island's vegetation is very sparse, and gunnery and inert ordnance practice would continue to be confined to only 8 percent of the island. Brush fires from

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	Kaula Island
	would remain as they do today, and activities would continue with the same SOPs and mitigation measures as presently conducted. Proposed land-based training and testing activities would not occur, and there would be no change in designated training areas. Therefore, no significant impacts on terrestrial biological resources would occur.	areas. Ground disturbance during missile launch activities may occur during implementation of the stabilizing system, but this ground disturbance is minimal, localized, and would not significantly impact vegetation communities. Additionally, launch pads are kept clear of vegetation, and surrounding areas are maintained/landscaped in accordance with SOPs and established wildfire mitigation measures. Therefore, impacts on vegetation would be less than significant. • Wildlife. Impacts on wildlife could result from temporary increases in noise, increased potential of electromagnetic radiation exposure, the use of artificial lighting, personnel or vehicle movement, or airfield operations. However, all proposed increases in activities would be short in duration and occur within regularly used training and testing sites. Any displacement of wildlife as a result of the Proposed Action would be temporary and short term. In addition, wildlife species have occurred at Barking Sands for decades during current training and testing activities, and no adverse effects have been observed. Wildlife species continue to use the habitats of Barking Sands before, during, and after training and testing activities. Established SOPs would continue to be implemented to minimize impacts from invasive species, noise, and physical disturbance to wildlife. As such, impacts on wildlife would be less than significant. • Special Status Species – ESA-Listed Species.	these activities are highly unlikely, and there have been no reports of fires from previous training activities. Therefore, impacts on vegetation would be less than significant. • Wildlife. Surveys summarized in Appendix E indicate that the seabird species composition of Kaula Island has remained consistent over time despite ongoing GUNEX and BOMBEX activities (using only inert gun ammunition, bombs and missiles). All activities would occur on a small portion within the first 1,000 feet of the southeast tip of the island and would continue to adhere to established SOPs. As such, impacts on wildlife would be less than significant. • Special-Status Species – ESA Listed Species. Increases in GUNEX and BOMBEX activities may affect Hawaiian monk seals hauled out at Kaula Island. Monk seals are known to haul out on rocky ledges at sea level outside of the designated ordnance delivery area. Per SOPs, if monk seals are observed hauled out on Kaula Island, any planned ordnance delivery is prohibited. Therefore, impacts under the Proposed Action to Hawaiian monk seals would be less than significant. • To address potential impacts on ESA-listed terrestrial species and in accordance with Section 7 of the ESA, the Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	**Kaula Island**
		Impacts on ESA-listed species at Barking Sands could result from temporary increases in noise, increases in radar operations, increases in personnel and vehicle movements, and the use of artificial lighting at night. However, increases in noise would be short-term. Activities conducted on unpaved areas would occur on maintained landscaped or low-quality habitat within areas regularly used for training and testing activities. Artificial night lighting would be minimal and limited to short-term events, and Dark Skies would be observed from September 15 to December 15 annually. Impacts would be short term, and no long-term impacts would occur under the Proposed Action. Established SOPs would continue to be implemented to minimize impacts from invasive species, noise, and physical disturbance to ESA-listed species. Therefore, impacts on terrestrial biological resources would be less than significant. To address potential impacts on ESA-listed terrestrial species and in accordance with Section 7 of the ESA, the Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to the United States Fish and Wildlife Service (USFWS) on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's	adversely affect the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and the plant known as *Portulaca villosa*. Effects on monk seals from training and testing activities are covered under the Hawaii-California Training and Testing EIS/OEIS. • MBTA-Listed Species. The impacts on MBTA-listed species from the proposed training and testing activities and associated noise at Kaula Island would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species on Kaula Island protected under the MBTA.

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	**Kaula Island**
		shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat. Effects on monk seals from training and testing are covered under a National Oceanic and Atmospheric Administration consultation for the Hawaii-California Training and Testing EIS/OEIS. • MBTA-Listed Species. Impacts on MBTA-listed species from the proposed training and testing activities and associated noise would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species protected under the MBTA.	
Cultural Resources	There would be no change from current levels of Navy-led training and testing activities and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation. Impacts on cultural resources would remain as they do today, and activities would continue with the same SOPs and minimization measures as presently conducted. Proposed increases in land-based training and testing	Impacts on cultural resources could occur from ground disturbance associated with training and testing activities. Historic properties have been recorded within the North Launch Area 1, Palai Olani, and Waiapuaa Bay Amphibious Staging training and testing areas. Identified historic properties would be avoided. All activities under the Proposed Action would be conducted on previously disturbed land, and personnel would not deviate from designated pathways. Any ground disturbing activities would require prior installation approval to establish appropriate avoidance and/or minimization measures. The Navy is fulfilling NHPA Section 106 requirements for this undertaking in accordance with the 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on	• The Navy is fulfilling NHPA Section 106 requirements for this undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii. Under the 2012 PA, and in response to public comments received on the Draft EA, the Navy is engaging with Native Hawaiian Organizations, Office of Hawaiian Affairs, and the Hawaii State Historic Preservation Division regarding the identification of Kaula Island as a TCP and the determination that the undertaking would result in adverse effects on the TCP. The Navy has initiated consultation with Native Hawaiian

Resource Area	No Action Alternative	Proposed Action	
		Barking Sands	Kaula Island
	activities would not occur, and there would be no change in designated training areas. Therefore, no significant impacts on cultural resources would occur.	Historic Preservation and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii. Avoidance and/or minimization measures in established SOPs and BMPs would continue to be implemented to ensure that there would be no adverse effect on historic properties. Per SOPs, if unanticipated cultural resources are encountered during any activity, all activities will cease in the immediate vicinity of the find and Navy archaeologist shall be notified to complete SOPs. Adverse effects would be minimized through the Memorandum of Agreement; therefore, impacts on cultural resources would be less than significant.	Organizations, State Historic Preservation Division, and other consulting parties to resolve adverse effects and develop a Memorandum of Agreement in accordance with Stipulation IX.C.1 of the 2012 PA and 36 Code of Federal Regulations section 800.6. • GUNEX and BOMBEX activities at Kaula Island would only occur within the southern inert ordnance impact area. All activities would remain confined to the previously disturbed impact area, where no archaeological sites have been identified. Adverse effects would be minimized through the Memorandum of Agreement; therefore, impacts on cultural resources would be less than significant.

Notes: AAQS = Ambient Air Quality Standards, BOMBEX = Bombing Exercise, C5ISRT = Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting, CO_2e = carbon dioxide equivalent, DNL = Average Day-Night Sound Level, EIS/OEIS = Environmental Impact Statement/Overseas Environmental Impact Statement, EMR = Electromagnetic Radiation, ESA = Endangered Species Act, FARP = Forward Arming and Refueling Point, GHG = greenhouse gas, GUNEX = Gunnery Exercise, HAP = Hazardous Air Pollutant, HRC = Hawaii Range Complex, LZ = Landing Zone, MT = Metric Tons, NHPA = National Historic Preservation Act, PA = Programmatic Agreement, PMRF = Pacific Missile Range Facility, ROI = Region of Influence, SOP = Standard Operating Procedure, TCP = Traditional Cultural Place, USFWS = U.S. Fish and Wildlife Service

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Acronyms and Abbreviations

Acronym	Definition
°F	degrees Fahrenheit
AAQS	Ambient Air Quality Standards
ACHP	Advisory Council on Historic Preservation
AICUZ	Air Installations Compatible Use Zone
AOR	Area of Responsibility
ARDEL	Advanced Radar Detection Laboratory
ARPA	Archaeological Resources Protection Act
BASH	Bird Aircraft Strike Hazard
BMP	Best Management Practice
BOMBEX	Bombing Exercise
C5ISRT	Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting
CAA	Clean Air Act
CDZ	Circular Drop Zone
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
CONUS	Continental United States
CR	Cultural Resource
CRM	Cultural Resource Management
CZMA	Coastal Zone Management Act
dB	Decibel(s)
dBA	A-weighted decibel(s)
DLNR	Department of Land and Natural Resources
DNL	Day-Night Level
DoD	Department of Defense
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMR	Electromagnetic Radiation
EO	Executive Order
ESA	Endangered Species Act

Acronym	Definition
ESQD	Explosive Safety Quantity Distance
FAA	Federal Aviation Administration
FACSFAC	Fleet Area Control and Surveillance Facility
FARP	Forward Arming and Refueling Point
FR	Federal Register
GHG	Greenhouse Gas
GUNEX	Gunnery Exercise
GWP	Global Warming Potential
HAP	Hazardous Air Pollutant
HAR	Hawaii Administrative Rules
HRC	Hawaii Range Complex
HRS	Hawaii Revised Statute
HSTT	Hawaii-Southern California Training and Testing
ICRMP	Integrated Cultural Resources Management Plan
JLTV	Joint Light Tactical Vehicle
KPGO	Kokee Park Geophysical Observatory
KTF	Kauai Test Facility
kW	Kilowatt
LNM	Local Notices to Mariners
LZ	Landing Zone
MBTA	Migratory Bird Treaty Act
MDA	Missile Defense Agency
MEP	Mobile Electric Power
mi.	Mile(s)
mm	Millimeter(s)
MOA	Memorandum of Agreement
MRTFB	Major Range and Test Facility Base
MSAT	Mobile Source Air Toxics
MT	Metric Ton(s)
N_2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act

Acronym	Definition
NASA	National Aeronautics and Space Administration
Navy	U.S. Department of the Navy
NEPA	National Environmental Policy Act
NHO	Native Hawaiian Organization
NHPA	National Historic Preservation Act
NM	Nautical Mile(s)
NO_2	Nitrogen Dioxide
NOTAM	Notice to Airmen
NO_x	Nitrogen Oxides
NRH	Navy Region Hawaii
NRHP	National Register of Historic Places
O_3	Ozone
OEIS	Overseas Environmental Impact Statement
OHA	Office of Hawaiian Affairs
OTB	Over-the-Beach
PA	Programmatic Agreement
Pb	Lead
PM_{10}	Particulate matter less than or equal to 10 microns
$PM_{2.5}$	Particulate matter less than or equal to 2.5 microns
PMRF	Pacific Missile Range Facility

Acronym	Definition
POV	Privately Owned Vehicle
RCA	Range Condition Assessment
RCRA	Resource Conservation and Recovery Act
RDT&E	Research, Development, Test, and Evaluation
ROI	Region of Influence
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Places
SME	Subject Matter Expert
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SO_x	Sulfur Oxides
sUAS	Small Unmanned Aircraft Systems
T&E	Test and Evaluation
TCP	Traditional Cultural Place
U.S.	United States
U.S.C.	United States Code
UAS	Unmanned Aircraft System
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	Volatile Organic Compound

1 Purpose and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy), has prepared this Environmental Assessment (EA) for land-based training and testing on lands under federal jurisdiction at the Pacific Missile Range Facility (PMRF) and Kaula Island in accordance with the National Environmental Policy Act (NEPA) and the Department of Defense (DoD) NEPA Implementing Procedures.

For this EA, the Action Proponent is the Commander, U.S. Pacific Fleet. The Missile Defense Agency (MDA) is a Cooperating Agency because of its launch activities at PMRF. The U.S. Army (Army), U.S. Air Force (Air Force), and U.S. Marine Corps (Marine Corps) are participating in the development of this EA as additional training units.

Proposed land-based training and testing activities would be conducted at PMRF, specifically at Main Base (hereinafter referred to as Barking Sands), and Kaula Island (Figure 1.3-1). Kaula Island is a crescent-shaped islet 20 nautical miles (NM) southwest of island of Niihau that has been under federal jurisdiction of the United States since 1924. Gunnery training that occurs on Kaula Island is coordinated through the Fleet Area Control and Surveillance Facility Pearl Harbor. The Proposed Action includes ongoing and proposed land-based training and testing activities at launch areas and other locations under federal jurisdiction at PMRF. Land-based training and testing activities contribute to fulfillment of the mission to protect and defend the United States and its allies; however, these activities have the inherent potential to affect the environment. A description of the Proposed Action is provided in Chapter 2 (Description of Proposed Action and Alternatives).

The goal of this EA is to assess reasonably foreseeable effects that the Proposed Action might have on the human environment (including the natural and biological environment) to assist in agency planning and determine whether there are significant impacts. If there are significant impacts which cannot be mitigated to less than significant, then an Environmental Impact Statement (EIS) must be prepared. The potential environmental impacts associated with land-based training and testing activities within the PMRF Study Area are evaluated under this EA.

1.2 Background

Strategically situated on the island of Kauai, PMRF provides integrated range services in a modern, dynamic, multi-domain environment that ensures the safe conduct and evaluation of training and research, development, test, and evaluation (RDT&E) missions. PMRF is a component of the Navy's Hawaii Range Complex (HRC). Comprehensive environmental analysis of land-based training and testing activities at PMRF and Kaula Island was previously addressed in the 2008 HRC EIS. The mission of PMRF is to oversee and coordinate training events from unit-level to multi-national exercises (including foreign militaries by invitation with Navy support) while simultaneously conducting or supporting RDT&E of Navy, DoD, and other federal agency programs and platforms. Activities at PMRF are monitored with real-time tracking and command/control capabilities located at or connected to land-based PMRF facilities. PMRF 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.

1.3 Location

The PMRF is located approximately 100 miles (mi.) northwest of Oahu on the northwest coast of the Hawaiian island of Kauai. The Study Area for this EA consists of Barking Sands and Kaula Island (Figure 1.3-1 and Table 1.3-1).

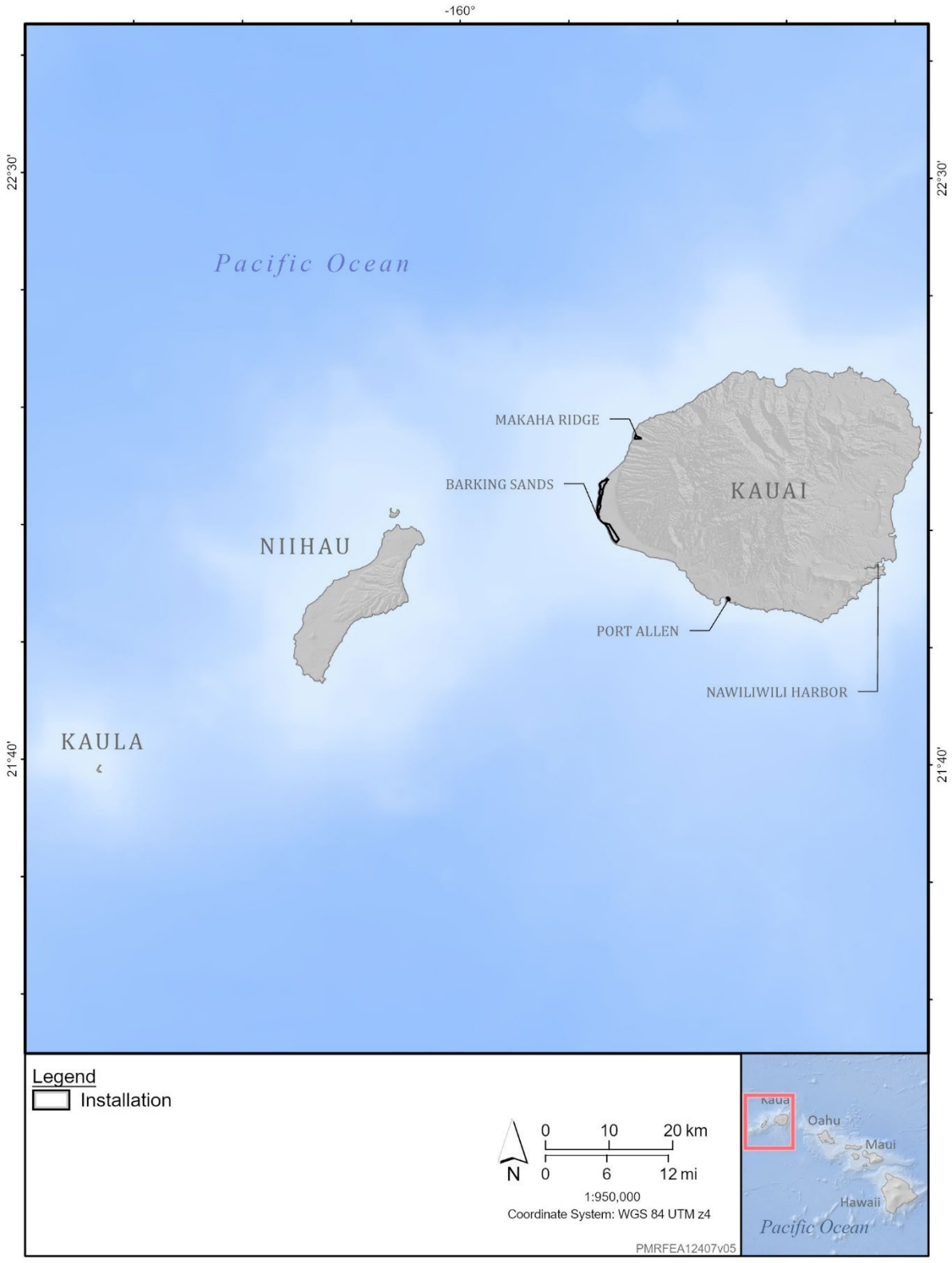


Figure 1.3-1: Regional Overview of PMRF Study Area

Table 1.3-1: Overview of PMRF Study Area

PMRF Land Areas	Uses	Total Acres
Barking Sands	Main Base and principal operations area for PMRF (within the installation boundaries) that are under federal jurisdiction; supports surface, subsurface, air, and space training and testing activities	1,933
Kaula Island	Inert aircraft gunnery and ordnance target practice	113[1]

[1] The area of impact on Kaula Island is approximately 11 acres.

1.4 Purpose and Need

The purpose of the Proposed Action is to provide U.S. military services and MDA with land-based, multi-domain training and testing at a level that supports military readiness into the reasonably foreseeable future.

The need for the Proposed Action is to ensure U.S. military services and MDA are able to organize, train, and equip service members and personnel to meet their respective national defense missions in accordance with their congressionally mandated requirements, as set forth in 10 United States Code (U.S.C.) section 7062 (Army), 10 U.S.C. section 8062 (Navy), 10 U.S.C. section 8063 (Marine Corps), 10 U.S.C. section 9062 (Air Force), and 10 U.S.C. section 205 (MDA).

1.5 Scope of Environmental Analysis

This EA compares the potential environmental impacts associated with the Proposed Action to the No Action Alternative (status quo) sufficient to determine whether there would be significant impacts that warrant preparation of an EIS. The Navy considered other alternatives (as explained in Section 2.1.1, Land-Based Training and Testing), but there are no other reasonable alternatives that can achieve the level of readiness the military services need to fulfill their Title 10 responsibilities.

The scope of this analysis focuses on the effects on land associated with land-based training and testing activities, to include airfield operations (aircraft landings, taxi, parking at idle power, and take-offs) conducted at the PMRF airfield in connection with Forward Arming and Refueling Point (FARP) and landing zone activities as discussed in Section 2.1 (Proposed Action). The airfield has been in use by the U.S. Navy since the mid-1950s and routine operations of the airfield and future usage have been evaluated under prior NEPA analysis, such as the 1998 PMRF EIS (U.S. Department of the Navy, 1998), as well as within the PMRF Air Installation Compatibility Use Zone Study, as discussed in Section 3.3 (Noise) (Naval Facilities Engineering Command Southwest, 2020). In addition, any effects in or over the water associated with land-based training and testing activities (e.g., launching a land-based missile towards a target at sea, in-water impacts from land-based missile launches, and amphibious operations) have been previously analyzed in prior related NEPA documents as listed below under Section 1.6 (Key Documents) and will be carried forward in future environmental planning documentation.

The scope of this EA does not include any of the lease or easement lands (Kokee, Makaha Ridge, Milolii Ridge, Kamokala, Mana Water Well, or lease lands that abut Barking Sands) that are currently under state jurisdiction. There are no proposed changes in use or operations in these locations and the current level of operations are analyzed in the PMRF and Kokee Park Geophysical Observatory Real Estate EIS

that is concurrently in development. The scope of this EA also does not include Port Allen or Niihau because there are no proposed changes in use or testing and training activities conducted at these locations, which are analyzed in the 2008 HRC EIS (U.S. Department of the Navy, 2008a).

The environmental resource areas analyzed in this EA include air quality, greenhouse gases, noise, public health and safety, terrestrial biological resources, and cultural resources. In accordance with NEPA, the description of the affected environment focuses on resources potentially subject to impacts from the Proposed Action.

1.6 Key Documents

Key documents are sources of information incorporated into this EA. Documents are considered key based on similar actions, analyses, or impacts that may apply to this Proposed Action. The DoD NEPA Implementing procedures encourage other environmental studies, surveys, and impact analyses be integrated as much as possible when developing environmental documentation and analyses. Documents listed in Table 1.6-1 are incorporated by reference.

Table 1.6-1: Documents Incorporated by Reference

Reference	Description
U.S. Army (1993)	Final Environmental Impact Assessment for the Restrictive Easement Kauai, Hawaii
U.S. Department of the Navy (1998, 1999b)	Pacific Missile Range Facility Enhanced Capability Final Environmental Impact Statement and Record of Decision for the Pacific Missile Range Facility Enhanced Capability Final Environmental Impact Statement
U.S. Department of the Navy (1999a)	Memorandum of Agreement Among the United States Department of the Navy, Pacific Missile Range Facility; The Hawaii State Historic Preservation Officer; and the Advisory Council on Historic Preservation Regarding Activities Proposed Within the Pacific Missile Range Facility Enhanced Capability Environmental Impact Statement, Barking Sands, Kauai, Hawaii
U.S. Department of the Navy (2001)	Integrated Natural Resources Management Plan: Pacific Missile Range Facility Hawaii
U.S. Department of the Navy (2003)	Programmatic Agreement Among the Commander Navy Region Hawaii, The Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii
U.S. Department of the Navy (2008a, 2008b)	Hawaii Range Complex Final Environmental Impact Statement/Overseas Environmental Impact Statement and Record of Decision
U.S. Department of the Navy (2009)	Environmental Assessment of the Advanced Radar Detection Laboratory (ARDEL), Pacific Missile Range Facility, Kauai, Hawaii
U.S. Department of the Navy (2010b)	Pacific Missile Range Facility Intercept Test Support Environmental Assessment/Overseas Environmental Assessment
U.S. Department of the Navy (2010a)	Finding of No Significant Impact (FONSI) for Pacific Missile Range Facility Intercept Test Support Environmental Assessment/Overseas Environmental Assessment at the Pacific Missile Range Facility, Kauai, Hawaii
U.S. Department of the Navy (2011)	Native American Graves Protection and Repatriation Act Comprehensive Agreement between U.S. Department of the Navy at Pacific Missile Range Facility, Kauai, Hawaii, and Na Ohana Papa O Mana

Reference	Description
U.S. Department of the Navy (2012c)	Programmatic Agreement Among the Commander Navy Region Hawaii, The Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii
U.S. Department of the Navy (2012a, 2012b)	Final Report Integrated Cultural Resources Management Plan for the Pacific Missile Range Facility Kaua'i Island, State of Hawaii Fiscal Year 2012-2017
U.S. Department of the Navy (2012b)	Integrated Natural Resource Management Plan Niihau Addendum: Pacific Missile Range Facility Islands of Kauai, Oahu, and Kaula, State of Hawaii
U.S. Department of the Navy (2013a, 2013b)	Hawaii-Southern California Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement and Record of Decision
National Marine Fisheries Service (2014)	Biological Opinion and Conference Report on U.S. Navy Hawaii-Southern California Training and Testing
U.S. Fish and Wildlife Service (2014)	Formal Consultation for Pacific Missile Range Facility Base-wide Infrastructure, Operations, and Maintenance Kauai
U.S. Fish and Wildlife Service (2018)	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
U.S. Department of the Navy (2018a, 2018b)	Hawaii-Southern California Training and Testing Final Environmental Impact Statement/Overseas Environmental Impact Statement and Record of Decision
Naval Facilities Engineering Command Southwest (2020)	Air Installations Compatible Use Zones Study Update for Pacific Missile Range Facility, Barking Sands, Kauai, Hawaii
Commander United States Pacific Fleet (2021)	Hawaii Range Complex Re-Initiation Terrestrial Biological Evaluation
U.S. Fish and Wildlife Service (2021a)	Concurrence on the Request for Re-Initiation of Informal Consultation for Ongoing Military Readiness Activities at Pacific Missile Range Facility, Kauai, Hawaii
Naval Facilities Engineering Systems Command Hawaii (2023)	Integrated Natural Resources Management Plan Pacific Missile Range Facilities Islands of Kauai, Kaula, and Niihau, State of Hawaii
U.S. Fish & Wildlife Service (2025)	Biological Opinion for Base Infrastructure Operations and Maintenance at Pacific Missile Range Facility Sites on Kauai, Hawaii

1.7 Relevant Laws and Regulations

The Navy has prepared this EA based upon applicable federal laws, statutes, regulations, and policies pertinent to the implementation of the Proposed Action, including the following:

- NEPA (42 U.S.C. sections 4321–4370h)
- Clean Air Act (42 U.S.C. section 7401 et seq.)
- Clean Water Act (33 U.S.C. section 1251 et seq.)
- Coastal Zone Management Act (16 U.S.C. section 1451 et seq.)
- National Historic Preservation Act (NHPA) (54 U.S.C. section 306101 et seq.)
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 et seq.)
- Endangered Species Act (16 U.S.C. section 1531 et seq.)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. section 703 et seq.)

- Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. section 9601 et seq.)
- Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)
- Emergency Planning and Community Right-to-Know Act (42 U.S.C. sections 11001–11050)
- Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments
- EO 13045, Protection of Children from Environmental Health Risks and Safety Risks

1.8 Public and Agency Participation and Intergovernmental Coordination

The Draft EA was released for a 30-day public review on August 30, 2024. The Navy informed the public of the Proposed Action and the potential environmental impacts through a Notice of Availability published in *The Garden Island* and the *Honolulu Star-Advertiser*. The notices included information about the availability of the Draft EA for public review and comment; physical and electronic locations where the public can access the Draft EA; date, time, and location of the public meeting (September 17, 2025 in Lihue, Kauai); and how to submit comments on the Draft EA.

The Navy received 1,889 comment letters, form letters, and emails from agencies, organizations, elected officials and the public during the public commenting period. Each comment was reviewed and categorized into specific topics representing the general issues or concerns expressed during the public review and comment period. Substantive public comments and responses are documented in Appendix D (Public Comments and Responses). The Navy considered these comments in the Final EA and conducted additional engagement with community groups, Native Hawaiian Organizations (NHOs), and elected officials. These engagements included a Congressional Delegation brief in October 2024, a meeting with the Kauai Port Allen Fishermen's Association in February 2025, a meeting with the Office of Hawaiian Affairs (OHA) in March 2025, and multiple meetings with NHOs and the Hawaii State Historic Preservation Division (SHPD) since November 2025 to discuss potential impacts and gather feedback on the Proposed Action.

Based on an evaluation of the effects of the Proposed Action discussed in the EA, the enforceable policies of Hawaii's Coastal Zone Management Program, and pursuant to 15 Code of Federal Regulations (CFR) section 930.35, the Navy determined that the implementation of the training and testing activities under the Proposed Action are on the list of Navy *de minimis* activities. The Navy submitted a notification letter of this determination to the Hawaii Office of Planning and Sustainable Development on September 19, 2024. Acknowledgment of receipt and acceptance of the Navy's use of the Coastal Zone Management Act (CZMA) *de minimis* list regarding the subject of PMRF land-based training and testing was provided by the Hawaii Office of Planning and Sustainable Development on September 30, 2024.

Informal consultation under Section 7 of the Endangered Species Act (ESA) was conducted with U.S. Fish and Wildlife Service (USFWS) to address potential impacts on ESA-listed terrestrial species. Due to proposed changes in the tempo of training and testing activities and consideration of additional species listed in 2016, the Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle; and the plants known as *Panicum niihauense* and its designated habitat, and *Portulaca villosa*.

The Navy met with the USFWS Migratory Bird Treaty Act (MBTA) office in November 2024 to discuss the Proposed Action as it relates to migratory birds; the Final EA has been updated in accordance with the outcome of that discussion.

The Navy is fulfilling its responsibilities under Section 106 of the NHPA for this undertaking in accordance with the 2012 Programmatic Agreement (PA) among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (U.S. Department of the Navy, 2012c) (hereinafter identified as the 2012 PA). Following the publication of the Draft EA in August 2024, the Navy received public comments regarding the religious and cultural significance of Kaula Island to Native Hawaiians. Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. The Navy shared information about prior surveys of Kaula Island, conducted additional information gathering and research, and engaged with NHOs regarding traditional knowledge and cultural practices pertaining to Kaula Island. Subsequently, the Navy determined Kaula Island meets the criteria of a traditional cultural place (TCP) eligible for listing on the National Register of Historic Places (NRHP) (hereinafter "Kaula Island TCP") and determined that the proposed undertaking would adversely affect the Kaula Island TCP. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the Advisory Council on Historic Preservation (ACHP), in an effort to resolve adverse effects and develop a Memorandum of Agreement (MOA) in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island).

2 Description of Proposed Action and Alternatives

2.1 Proposed Action

2.1.1 Land-Based Training and Testing

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, which are national assets that must be preserved 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 operations and Navy Fleet training.

Training and testing activities have been conducted at PMRF for decades. PMRF has supported various missile test and evaluation programs that include target launches and flight tests of missile interceptors. The tempo and types of training and testing activities at PMRF have fluctuated over the years because of the introduction of new technologies, the evolving nature of international events, advances in training and warfighting doctrine and procedures, evolving joint exercise cycles, and changes in force structure (e.g., organization of ships, weapons, and personnel). Such developments influence the duration, intensity, location, and frequency of required training and testing activities at PMRF, as described in Table 2.1-1 and Table 2.1-3.

The Proposed Action is to continue to conduct land-based, multi-domain training and testing activities to support military training readiness at launch areas and other locations within the existing federal jurisdiction PMRF footprint, to include Barking Sands and Kaula Island (Figure 2.1-1). The Proposed Action also includes increases in training and testing activities conducted by the Army, Air Force, Marine Corps, and MDA (to include, at times, participation of foreign militaries). Training and testing activities may also include the participation of foreign militaries by invitation with Navy support. No new types of training and testing activities are being proposed at Barking Sands or Kaula Island; all activities included in the Proposed Action have been previously conducted at these locations at some point over the past 20 years and have been analyzed in relevant environmental documentation listed in Table 1.6-1.

In developing the Proposed Action, the Navy engaged with the Army, Air Force, Marine Corps, and MDA to identify training and testing activities/capabilities that could not be supported at other locations and which PMRF was already supporting due to the availability of facilities and range assets. These activities were then assessed based on increased tempo requirements against factors of safety, range capability, and capacity given current operational and testing scheduling and deconfliction. Based on this assessment, the Navy determined the tempo of training and testing activities that PMRF could support into the reasonably foreseeable future. The proposed tempo under the Proposed Action is what is reasonably feasible at PMRF and is the minimum necessary for the services to fulfill their Title 10 responsibilities and training requirements. It is for these reasons that no other alternative was carried forward for analysis. This EA reflects the most up-to-date compilation of land-based training and testing activities deemed necessary to accomplish military readiness requirements.

2.1.2 Training and Testing Study Area

The overall Study Area (Figure 2.1-1) consists of the land portion of Barking Sands, a roughly 0.5 mi. wide and 7.5 mi. long area, beginning at the high tide line, and extending inland to the boundary of the PMRF installation. The Study Area also includes Kaula Island (an offshore islet where inert gunnery and bombing occurs). Collectively, the Study Area encompasses typical training and testing sites.

2.1.2.1 Barking Sands

Table 2.1-1 provides a list of unit-level and coordinated training and testing activities (including those conducted in major training exercises), activity descriptions, locations where activities would be conducted, annual tempo of ongoing activities, and annual activities proposed to occur at Barking Sands. The average number of annual activities reflects the current or ongoing tempo (status quo). A more detailed description of proposed training and testing activities is provided in Appendix A (Military Readiness Activity Descriptions). Training and testing activities as listed in Table 2.1-1 have current environmental coverage under the documents referenced in Table 1.6-1; the Proposed Action includes an increase in the tempo of these activities to accommodate evolutions in DoD services' training and testing needs. Proposed annual activity levels were determined by combining the Navy's peak historical usage with other services' requested events.

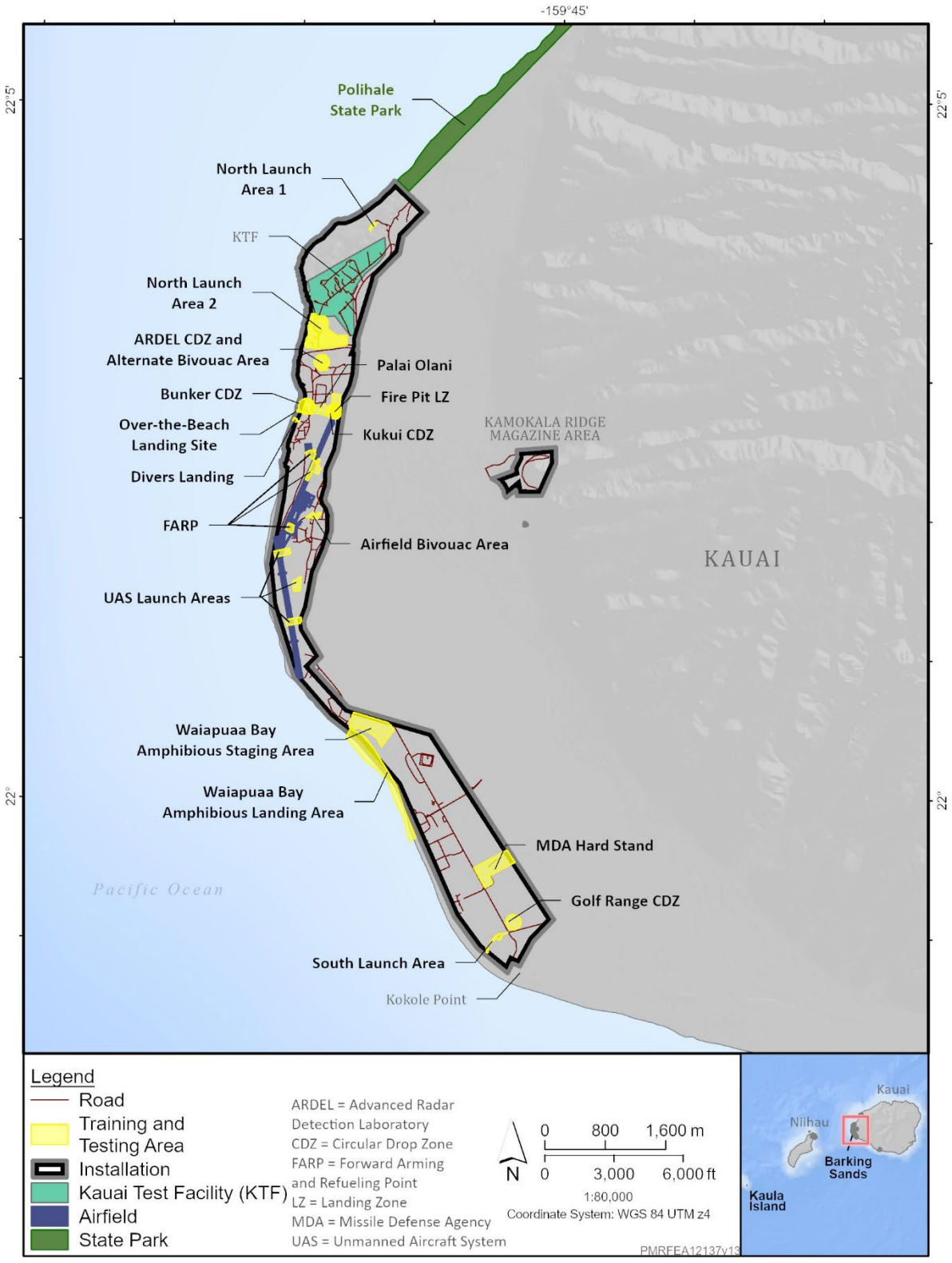


Figure 2.1-1: Training and Testing Sites in the Study Area – Barking Sands

Table 2.1-1: Proposed Training and Testing Activity Descriptions – Barking Sands

Activity Name	Activity Description	Training & Testing Area	Type of Munitions	Ongoing Average # of Annual Activities*	Proposed # of Annual Activities
Missile, Rocket, and Aerial Target Drone Launch	Terrestrial portion of launching missiles, rockets, and aerial target drones from established launch areas ashore. Aerial or surface target intercepts to occur offshore, on or above water.	North Launch Area 1	BQM-34, BQM-177, MK-5, GQM-163	10	15
		North Launch Area 2	Vertical Launch System (VLS), Terminal High Altitude Area Defense (THAAD), (Navy Marine Expeditionary Ship Interdiction System) NMESIS, Smokey Sams, Mid-Range Capability (MRC), High Mobility Artillery Rocket System (HIMARS)	7	20
Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Conduct non-live-fire missile or rocket system launch preparation by deploying, making ready for launch, and redeploying a transportable tactical missile or rocket system.	North Launch Area 1, North Launch Area 2, and South Launch Area	None	1	6
Artillery	Terrestrial portion of land-based forces live firing of artillery guns at surface (waterborne) or air targets.	North Launch Area 2	155mm artillery rounds	1	3
Amphibious Operations (Raid, Small Boat Operations, Swimmer Insertion/Extraction)	Raid. Company (unit-sized) forces move from amphibious ships at sea, conduct amphibious landing via various vessels/watercraft/vehicles, and conduct follow-on activities ashore. Return to amphibious ships at sea.	Waiapuaa Bay Amphibious Landing Area	None	1	2

Activity Name	Activity Description	Training & Testing Area	Type of Munitions	Ongoing Average # of Annual Activities*	Proposed # of Annual Activities
	Small Boat Operations. A Unit using small boats moves from offshore location to a beach landing site, carry boat to an inland site, conduct reconnaissance, and then return to the sea via small boat.	Waiapuaa Bay Amphibious Landing Area and Divers Landing	None	1	19
	Swimmer Insertion/Extraction. Personnel conduct Over-the-Beach water entry swimmer insertion and extraction training in Barking Sands amphibious landing areas.	Waiapuaa Bay Amphibious Landing Area, Divers Landing, and Over-the-Beach Landing	None	1	2
Forward Arming and Refueling Point (FARP) Operations	Establish, operate, and re-deploy a FARP site using the Tactical Airfield Fuel Dispensing Systems, Helicopter Expedient Refueling System, or similar type expeditionary aircraft refueling system. Aircraft examples: MV-22, KC-130, CH-47, AH-64, FA-18, F-35, P-8.	FARP Areas	None	1	20
Small Unmanned Aircraft Systems (sUAS) and Counter-Unmanned Aircraft Systems (UAS) Operations	Conduct sUAS operations. Launch and control sUAS. Conduct counter-UAS operations. Launch and control a counter-UAS system from a land location.	UAS Launch Area	None	1	45
Parachute Operations	Conduct parachute operations (land).	ARDEL Circular Drop Zone (CDZ), Bunker CDZ, Golf Range CDZ, and Kukui CDZ	None	1	16
Command, Control, Computing, Communications,	Establish and operate a tactical field command post, communication systems, radar tracking and	North Launch Area 1	None	1	30
		North Launch Area 2		3	12
		South Launch Area		1	18

Activity Name	Activity Description	Training & Testing Area	Type of Munitions	Ongoing Average # of Annual Activities*	Proposed # of Annual Activities
Cyber, Intelligence, Surveillance, Reconnaissance and Targeting Exercise to include Command Post Exercise, Communication Relay Exercise	surveillance systems, optical tracking systems, and electronic warfare equipment operated on concrete areas or by mobile vehicles.	MDA Hard Stand		1	10
Bivouac (unit, medium, large)	Establish and operate expeditionary field lodging for personnel conducting training.	Airfield Bivouac Area	None	1	26
		MDA Hard Stand		1	4
		Palai Olani		1	6
		North Launch Area 2		1	9
		Alternate Bivouac Area (ARDEL)		1	2
Helicopter/Tilt-Rotor Landing Zone (LZ) Operations (off airport surface)	Helicopter/Tilt-Rotor aircraft conduct LZ Operations (off airport surface). Deliver/recover personnel or equipment from/to unimproved landing zone locations.	Fire Pit LZ	None	1	12

*Quantity represents the average activity occurrences, over the period 2019–2023.

2.1.2.1.1 North Launch Area 1

North Launch Area 1, located in the north end of Barking Sands (Figure 2.1-2), is bounded by Polihale State Park to the north, agricultural lands to the east, Kauai Test Facility (KTF) to the south, and dunes of the Pacific Ocean to the west. The site is approximately 1 acre and contains launch pads, a launcher, and communication facilities.

2.1.2.1.2 North Launch Area 2

North Launch Area 2, located in the northern portion of Barking Sands (Figure 2.1-3), is bounded by KTF to the north, vegetated areas to the east, Nohili Ditch to the south, and dunes of the Pacific Ocean to the west. The site is approximately 38 acres and contains launch pads, launchers, and command and communication facilities.

2.1.2.1.3 South Launch Area

The South Launch Area (Kokole Point), located at the southern end of Barking Sands (Figure 2.1-4), is bounded by PMRF communication equipment areas to the north and east, and dunes of the Pacific Ocean to the south and west. The site is approximately 2 acres and contains a single launch pad area. Located northeast of the launch area, the Golf Range Circular Drop Zone (CDZ) is a 100-meter radius circular area used for personnel parachute landing training.

2.1.2.1.4 Palai Olani

The Palai Olani area (Figure 2.1-5) is approximately 20 acres and is bounded by fuel storage to the north; Nohili Road to the east; airfield parking and ordnance repair support facilities to the south; and with water entry/exit exceptions, dunes of the Pacific Ocean to the west. Areas co-located within or adjacent to Palai Olani include the following:

- Divers Landing: personnel using small boats move from an offshore location to a beach landing site, carry boats to an inland site, conduct reconnaissance, and return to the sea via small boat.
- Over-the-Beach (OTB) Landing Site: personnel train for water entry swimmer insertion and extraction.
- Fire Pit Landing Zone: Helicopter/Tilt-Rotor aircraft conduct landing zone operations (off the airfield's paved surface) to deliver or recover personnel or equipment.
- Bunker and Kukui CDZs: two 100-meter radius circular areas used for personnel parachute landing training.

2.1.2.1.5 Waiapuaa Bay

Waiapuaa Bay is located in the southern portion of Barking Sands (Figure 2.1-6), south of the airfield and north of PMRF housing. The bay is approximately 0.75 mi. long and includes the immediate beach area used to support amphibious training. The components of Waiapuaa Bay include the following:

- Waiapuaa Bay Amphibious Landing Area: amphibious vehicles and vessels come ashore to offload equipment and personnel for follow-on training. The area covers approximately 45 acres.
- Waiapuaa Bay Amphibious Staging Area: a temporary location for logistical supply cache, brought ashore from ships at sea. The area covers approximately 31 acres.

2.1.2.1.6 Missile Defense Agency Hard Stand

The MDA Hard Stand area is located in the southern portion of Barking Sands (Figure 2.1-7), with solar farms (photovoltaic collector panels) to the north and south, Kaumualii Highway and non-DoD lands to the east, and vegetated areas to the west. This site is 27 acres and supports radar testing.



Figure 2.1-2: North Launch Area 1



Figure 2.1-3: North Launch Area 2

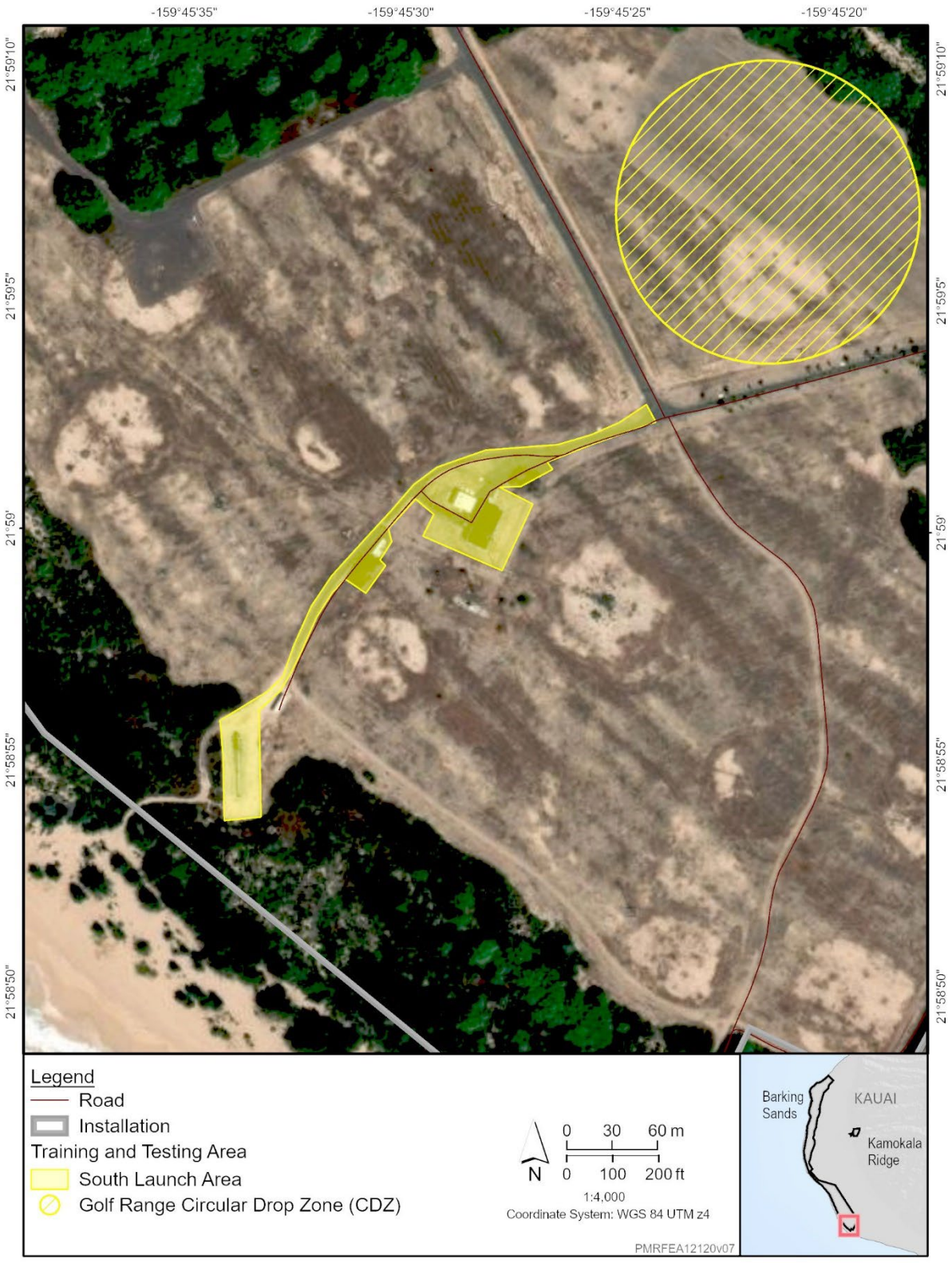


Figure 2.1-4: South Launch Area and Golf Range CDZ

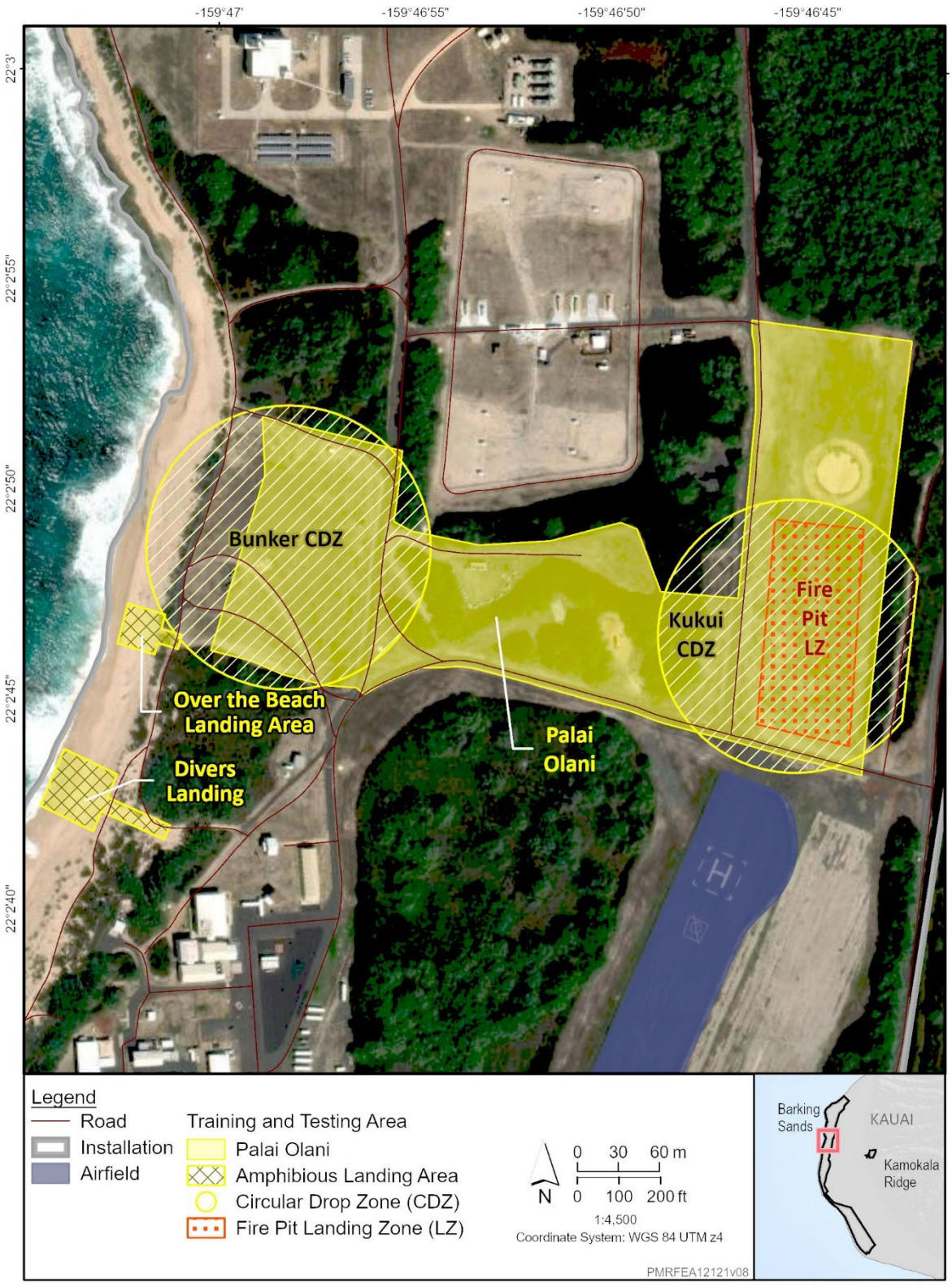


Figure 2.1-5: Palai Olani



Figure 2.1-6: Waiapuaa Bay

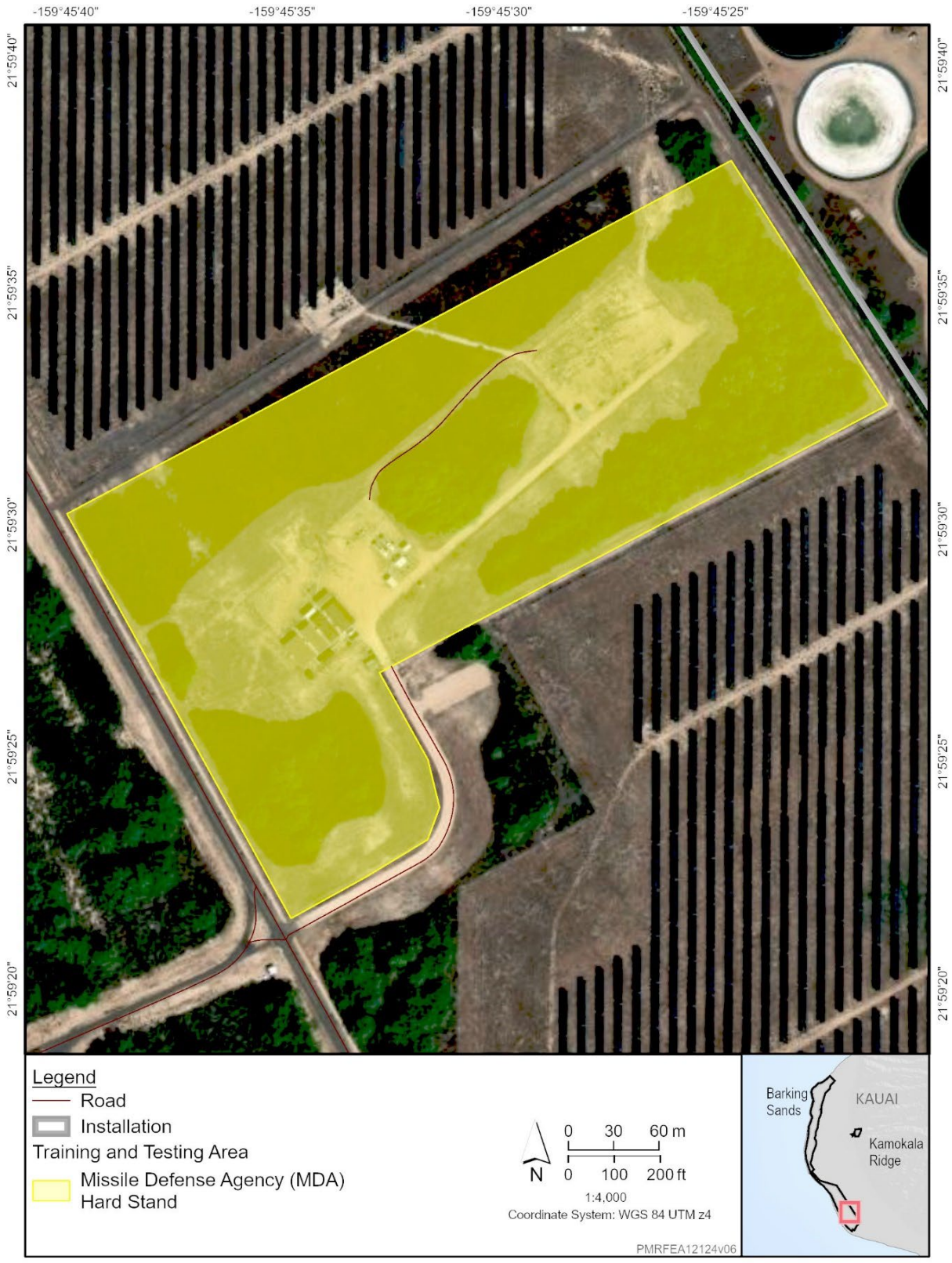


Figure 2.1-7: Missile Defense Agency Hard Stand

2.1.2.1.7 Airfield Bivouac Area

The Airfield Bivouac Area is located adjacent to the airfield site (Figure 2.1-8), straddling the main north-south road (Nohili Road). This area is 2 acres and has several logistical support buildings.

2.1.2.1.8 Alternate Bivouac Area

The Alternate Bivouac Area is located within the Advanced Radar Detection Laboratory (ARDEL) site (Figure 2.1-9), immediately south of Nohili Ditch. The area is approximately 5 acres. The ARDEL CDZ, a 100-meter radius circular area used for personnel parachute landing training, is co-located in this area.

2.1.2.1.9 Forward Arming and Refueling Point Areas

Forward Arming and Refueling Point areas (Figure 2.1-10) cover approximately 10 acres and are located on or abutting the airfield's paved aircraft parking ramps.

2.1.2.1.10 Unmanned Aircraft System Launch Area

The Unmanned Aircraft System (UAS) Launch Area (Figure 2.1-11) covers 4 acres and is adjacent to the runway for the launching catapult systems and on the PMRF runway for the UAS recovery system.



Figure 2.1-8: Airfield Bivouac Area



Figure 2.1-9: Alternate Bivouac Area and ARDEL CDZ



Figure 2.1-10: Forward Arming and Refueling Point Areas



Figure 2.1-11: Unmanned Aircraft System Launch Area

2.1.2.2 Kaula Island

Kaula Island (Figure 2.1-12) is located approximately 52 NM southwest of Barking Sands, and 20 NM from Niihau. The southern 1,000 feet of the island, covering approximately 11 acres (8 percent of the island), is used for air-to-ground bombing and gunnery training. Only delivery of inert (non-explosive) ordnance is permitted at Kaula Island. Use of live ordnance at Kaula Island is prohibited. No explosive munitions have been authorized at Kaula since at least 1981, and use of high-explosive munitions are not authorized; however, previous surveys have noted unexploded ordnance (UXO) may exist on the island (see Section 3.4.4.1.5, Aircraft Ordnance Delivery, for discussion).

The proposed number of training and testing activities on Kaula Island are shown in Table 2.1-3. Activity descriptions for Gunnery Exercises (GUNEX) and Bombing Exercises (BOMBEX), along with the types of munitions used, are also included. Since release of the Draft EA in August 2024, the Navy has reviewed past usage of Kaula to understand its extent. Current environmental coverage under the 2008 HRC EIS allows for 250 Navy BOMBEX activities and 18 GUNEX activities at Kaula Island on an annual basis. Past utilization of Kaula Island for BOMBEX and GUNEX events from 2013 to 2025 are included in Table 2.1-2, and Table A-12 and Table A-14 in Appendix A (Military Readiness Activity Descriptions). The information in Table 2.1-2 indicates much less usage of Kaula Island over the last 13 years than was originally evaluated in past environmental documents (U.S. Department of the Navy, 1998, 2008a). The annual average usage of Kaula Island is 67 percent less for GUNEX activities and 97 percent less for BOMBEX activities than what was permitted in the 2008 HRC EIS (Table 2.1-3). Many factors account for the fluctuation in usage of Kaula Island, including variations in cycles and deployment schedules that do not follow a traditional annual calendar but instead are influenced by in-theater demands and other external factors. Proposed GUNEX and BOMBEX training activities at Kaula Island are relevant for maritime conflict where islands can serve as strategic and logistic hubs. The ability to use Kaula Island, particularly for Navy units, serves as a contingency air-to-ground area for the occasional need of a deploying unit that has not been able to complete training/qualifications in the Southern California training areas. Training activities at Kaula Island also occur during large-scale exercises like Rim of the Pacific (commonly known as RIMPAC). Additionally, the Air Force, Army, and Marine Corps need to expand their capability to conduct air-to-ground combat in a maritime environment; this location offers local units from those services an opportunity they have not had in the past.

Table 2.1-2: Past Kaula Island Utilization for GUNEX and BOMBEX Events

Year	Number of GUNEX Events	Number of BOMBEX Events
2013	2	5
2014	13	23
2015	11	6
2016	8	9
2017	11	19
2018	12	14
2019	2	2
2020	6	1
2021	4	4
2022	0	4
2023	0	1
2024	0	0
2025*	0	0

*Usage as of July 31, 2025



Figure 2.1-12: Kaula Island

Table 2.1-3: Proposed Training and Testing Activity Descriptions – Kaula Island

Activity Name	Activity Description	Training & Testing Area	Type of Munitions	Ongoing Average # of Annual Activities*	Proposed # of Annual Activities Permitted	# of Annual Activities Permitted Under Existing Environmental Coverage*
Air-to-Ground Gunnery Exercise (GUNEX)	GUNEX involves strike fighter aircraft and helicopter crews employing inert gun ammunitions and inert rockets to attack ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel. Inert ordnance only. GUNEX may include the use of targeting laser.	Kaula Island	20–30mm machine gun bullets and 2.75-inch non-explosive rockets	6	24	18
Air-to-Ground Bombing Exercise (BOMBEX)	BOMBEX involves training of strike fighter aircraft delivery of inert ordnance only against land targets in day or night conditions and may include the use of targeting laser.	Kaula Island	Subscale, non-explosive practice munitions (25 pounds), laser-guided non-explosive training round (100 pounds), and non-explosive practice munitions (500 pounds)	7	31	250

* Source: 2008 HRC EIS (U.S. Department of the Navy, 2008a).

2.1.3 Training and Testing Aerial Vehicles/Weapons Systems

Table 2.1-4 lists the typical types of equipment that may be used during proposed training and testing activities within the Study Area. Each activity would require a specific mix of personnel, equipment, and supporting systems. Further, the particular goal of a single training evolution may require a specific set of equipment.

Table 2.1-4: Typical Equipment for PMRF Land-Based Training and Testing

Equipment Type	Description
Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting (C5ISRT)	
Communication Equipment, Satellite Receivers/Transmitters	Radios for receiving and transmitting voice and data information
Radar	Surveillance, acquisition, and targeting during interceptor flight tests
Electronic Warfare Equipment (vehicle-mounted)	Radio frequency detection equipment and mobile emitters, such as On-the-Move Networking systems
Ground Support Vehicles[1]	
Joint Light Tactical Vehicle (JLTV), High Mobility Multipurpose Wheeled Vehicle (HMWWV), Infantry Support Vehicle	Four-wheeled vehicles for transporting personnel and equipment
7-ton truck	Multi-wheeled vehicle for transporting personnel and heavy equipment
Heavy Expanded Mobility Tactical Truck (HEMTT)	Multi-wheeled vehicle for missile, rocket, and refueling support
Live-Fire Munitions	
Missile	Missile launcher, missile, train in employment of tactical missile launching, such as a land-launched Naval Strike Missile (NSM)
Rocket	Rocket launcher, rocket, train in employment of tactical rocket launching, such as the High Mobility Artillery Rocket System (HIMARS)
Aerial target drone	Aerial target drone launcher, drone, that support anti-air warfare training, such as the BQM-177 target drone
Artillery	Artillery, to include large mortars, for firing 105 millimeter (mm), 120mm, or 155mm artillery rounds
Aircraft	
Small Unmanned Aircraft System (sUAS)	sUAS, hand launched or catapult launched, with ground control system and flight vehicle, which may be fixed wing or rotary wing
Tilt-rotor aircraft	MV-22, both vertical and short take-off capabilities, for transport, personnel, and equipment
Rotary-wing aircraft	CH-53, heavy-lift helicopter, used for transporting personnel, equipment, or supplies; AH-64, UH-60, attack and utility helicopters, providing air-delivered munitions and logistics support

[1] Smaller vehicles may be used; however, the largest types of vehicles are listed for purpose of analysis.

2.2 Screening Criteria

NEPA requires agencies to consider alternatives in an EA. These regulations require the decision maker to consider the environmental effects of the Proposed Action and a reasonable range of alternatives to the Proposed Action. Alternatives were determined based on the criteria that an alternative should be technically and economically feasible; meet the purpose and need for the proposed action; and, where applicable, meet the goals of the applicant in accordance with the DoD NEPA Implementing Procedures.

The following screening criteria were developed to determine if a potential alternative is reasonable and meets the purpose and need if it supports:

- realistic military readiness activities for the Navy, Marine Corps, Army, and Air Force
- requisite air, surface, and sub-surface range tracking, instrumentation, and communications capabilities
- variable training and testing schedules through allowance of year-round training and testing
- training and testing in proximity to home ports and bases where crews are located in Hawaii
- maximum access to and utilization of existing and future offshore and land-based range infrastructure resources and facilities
- provision of training and testing access to diverse and variable marine environments that replicate real-world conditions where military personnel would be expected to operate

2.2.1 No Action Alternative

The purpose of including the No Action Alternative in environmental impact analyses is to allow agencies to compare the potential impacts of a proposed action with the known impacts of maintaining the status quo. The No Action Alternative is included in this EA as the existing, or baseline (current), level of activity at existing training and testing locations at PMRF required to support ongoing Navy-led training and testing activities. In other words, the No Action Alternative represents no change from current levels of Navy-led training and testing activities, and does not include additional proposed training or testing by the Army, Marine Corps, Air Force, and MDA not previously analyzed in prior documents listed in Table 1.6-1.

2.2.2 Alternatives Considered but Eliminated

Alternatives eliminated from further consideration are described below. The Navy determined that these alternatives did not meet the purpose of and need for the Proposed Action.

2.2.2.1 Alternative Training and Testing Locations

Decades of evolving improvements to the PMRF training range now allows for a full spectrum of multi-domain training and testing to occur in a single range complex. While some unit-level training and testing activities may require only one training element (e.g., airspace, sea surface space, undersea space), more advanced training and testing events require a combination of air, surface, and undersea space as well as access to land ranges. No other location matches these attributes, which are as follows:

- Proximity to the homeport region of Hawaii, and the Navy, Marine Corps, Army, and Air Force commands, ships, submarines, schools, and aircraft units stationed there. Training within Hawaii decreases transit time to equivalent overseas capabilities and ranges, shortens maintenance delays for equipment post-deployment, and reduces biosecurity concerns following overseas use of equipment.
- Proximity to shore-based facilities and infrastructure, joint headquarters, and the logistical support provided for training and testing activities.
- Possesses air, surface, and sub-surface range tracking, instrumentation, and communications capabilities.
- Proximity to military families, minimizing the length of time military personnel spend deployed away from home and benefitting overall readiness.
- Environmental conditions (e.g., topography, and weather) found in the Study Area that maximize the training realism and testing effectiveness.

- Operational conditions (e.g., a unit can come ashore and fire a live rocket or missile at a target ship for training purposes) within the Study Area that allows long range command and control operations with joint partners aligned under U.S. Indo-Pacific Command.

No other alternatives were identified that could fulfill the need for the Proposed Action. PMRF is the only feasible location within Hawaii to conduct the multi-service land-based training and testing activities listed in this Proposed Action, as it is an existing range that offers diverse and multi-dimensional capabilities and allows range users to develop and maintain high levels of military readiness. Existing Army ranges and training lands within Hawaii are significantly constrained due to space (geography and size) and demand from Army units in addition to supporting other DoD service components, to include the Marine Corps, Navy, and Air Force. Region-specific commands, such as the Multi-Domain Task Force, 8th Theater Sustainment Command, and the 94th Air and Missile Defense Command have maritime domain live fire training requirements that cannot be met on existing Army training areas. PMRF consists of instrumented, multi-environmental ranges that support long-range live fire and non-live-fire training capabilities absent on Marine Corps and Army ranges. This is due to the extensive at-sea range, expansive controlled airspace, and unique coastal geography that is not available on Marine Corps and Army training areas in Hawaii or the Continental U.S.

As such, the unique and interrelated nature of the features of PMRF (land ranges, undersea terrain, at-sea ranges, and controlled airspace) provides the training and testing venue needed to support complex military activities. There is no other integrated range in Hawaii that affords the required level of operational support and comprehensive integration of training and testing activities. Therefore, no other training and testing locations outside of PMRF meet the purpose and need for the Proposed Action.

2.2.2.2 Eliminating Military Training Activities on Kaula Island

In response to public comments on the Draft EA, the Navy considered eliminating training on Kaula Island. The Navy examined the last 13 years of usage data and determined that the island is necessary for conducting GUNEX and BOMBEX training. This type of GUNEX and BOMBEX training is essential in preparing for maritime conflicts, as islands can serve as strategic and logistical hubs, and Kaula Island provides a unique, controlled, and safe environment for these exercises. The island is a key asset for rapidly developing combat proficiency for Hawaii-based forces and those surging from the continental United States (CONUS). It is also the only location within the Hawaiian Islands where overwater training can currently occur. As such, Kaula Island is considered an irreplaceable training site for several reasons:

- The island's proximity to the Hawaiian Islands provides an opportunity for increased training capacity for both resident forces and those converging in the area before deploying west. It is the most logistically sensible location for training and certifying aircraft before they proceed toward the Western Pacific.
- The impact area on the southern tip of Kaula Island is the only sea-to-shore land-based target in the HRC that can support laser-guided training rounds and a variety of inert weapons up to 500 pounds. It is also part of an unparalleled combination of land ranges, operating areas, undersea terrain, and military airspace. This combination is essential for the realistic and effective training needed to certify naval forces for combat operations.
- While other ranges exist in CONUS or the Mariana Islands, they are not viable alternatives for all training. For instance, the Farallon de Medinilla range is 6,200 miles further west from the coast of CONUS. Using Farallon de Medinilla for inert weapons training would create scheduling

challenges and there are no plans for new activities. Additionally, requiring Hawaii-based units to return to CONUS to train at sites like San Clemente Island is less efficient and more costly due to fuel consumption.

- The only other land-based target training location in the HRC is the Pohakuloa Training Area. However, Pohakuloa Training Area does not provide the necessary sea-to-shore transition required for certain training qualifications. Furthermore, its availability is subject to inter-service demand, which could lead to scheduling challenges for Navy units.

A reduction or termination of access to Kaula Island would significantly impact the readiness and mission effectiveness of units in the U.S. Indo-Pacific Command (INDOPACOM) area of responsibility (AOR). Maintaining the Kaula Island target range is critical for the tactical combat training of Navy, Marine Corps, Army, and Air Forces to develop proficiency in long-range overwater strikes. This training is essential for forces to respond to contingencies in the Western Pacific or threats against the Hawaiian Islands or the continental U.S. The island serves as a critical asset for rapidly developing combat proficiency for Hawaii-based forces and forces surging from CONUS, enabling them to meet accelerated timelines and be combat-ready before entering the weapons engagement zone of peer competitors to the west. In the event of joint mobilization for a conflict in the Pacific, Kaula Island is the primary location for maritime and joint long-range fires rehearsals. It is the only location in the Hawaiian Islands where overwater training can occur with inert weapons, which is necessary for Army and Marine Corps aviation units operating in the INDOPACOM AOR.

The loss of Kaula Island would result in reduced unit qualifications in fire support, decreased deterrence, and limited operational flexibility in the INDOPACOM AOR. For Hawaii-based forces, this loss would create a gap in the ability to defend the Hawaiian Islands and to surge in a timely manner for combat operations. Relocating these forces to CONUS for proficiency training is not a viable option. Therefore, eliminating military training activities on Kaula Island does not meet the purpose of and need for the Proposed Action and has been eliminated from detailed study.

2.2.2.3 Simulated Training and Testing Only

The Services currently use simulators for training and testing whenever possible (e.g., command and control exercises conducted without operational forces); however, simulation has significant limitations, and its use cannot replace live training or testing. Live training remains essential for its realism and its ability to help trainees develop physical skills, improve teamwork, increase adaptability, manage risk, and account for human factors (e.g., physical fatigue, fear) as part of training. It complements and enhances the overall training experience, ensuring comprehensive readiness for real-world operations. Furthermore, operational training and testing cannot be based exclusively on computer modeling or simulation (see 10 U.S.C. sections 2366 and 2399). Therefore, simulation as an alternative that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action and has been eliminated from detailed study.

2.3 Standard Operating Procedures Included in the Proposed Action

To avoid and minimize potential environmental effects from the Proposed Action, Standard Operating Procedures (SOPs) and minimization measures would continue to be followed for training and testing activities. These measures are listed for each applicable resource section of this EA (Sections 3.1–3.6). The impact assessment provided in this EA accounts for the implementation of these measures. SOPs are existing policies, practices, and measures that the Navy uses to reduce the environmental impacts of proposed activities, functions, or processes, and are inherently part of the Proposed Action.

3 Affected Environment and Environmental Consequences

3.0 Introduction

This section presents a description of the environmental resources and existing conditions that may be adversely affected as a result of implementation of the Proposed Action, and an analysis of potential direct or indirect effects. All potentially relevant environmental resource areas were considered for analysis in this EA. In compliance with NEPA, the discussion of the affected environment (i.e., the current state of the environment based on best available data) focuses on only those resource areas potentially subject to adverse effects. Additionally, the level of detail used in describing a resource is commensurate with the anticipated level of potential environmental impact.

The analysis presented in this section focuses on air quality, greenhouse gases, noise, public health and safety, terrestrial biological resources, and cultural resources, and potential impacts on these resources as a result of implementation of the Proposed Action and No Action Alternative. Potential impacts on the resource areas listed in Table 3.0-1 are considered to be negligible or non-existent and therefore were not analyzed further in this EA. The Proposed Action does not include construction and would not result in an increase or decrease in the local workforce.

Table 3.0-1: Resource Areas Not Carried Forward for Further Analysis

Resource Area	Justification
Water Resources	The Proposed Action is not expected to impound, divert, drain, control, or otherwise modify the waters of any stream or other body of water. Proposed training and testing activities do not involve changes to drainage patterns and therefore are not expected to introduce pollutants to surface waters or groundwater in the Study Area. Spill response and prevention procedures would comply with PMRF's Spill Prevention, Control, and Countermeasure Plan and Spill Contingency Plan to prevent and respond to any potential spills associated with proposed activities. Therefore, water quality is not expected to be measurably impacted.
Geological Resources	The Proposed Action does not include construction. Any ground-disturbing activities (i.e., placement of grounding rods) would not occur in undisturbed areas without prior approval and if approved would be minimized through implementation of SOPs and protective measures. Therefore, geological resources in the Study Area are not expected to be measurably impacted.
Visual Resources	The Proposed Action does not include the construction of permanent new structures over any undisturbed areas and therefore is not expected to permanently alter views or scenic quality associated with publicly recognized vistas, viewsheds, overlooks, or features within the Study Area or surrounding area.
Airspace Management	The Proposed Action does not include changes to airspace designation or restriction in the existing airspace within the Study Area or surrounding area.
Infrastructure	The Proposed Action does not include changes to infrastructure within the Study Area. Therefore, any disruption or change to existing wastewater, water, telecommunication, or other utility services with implementation of the Proposed Action is not expected. Proposed increases in training and testing and associated personnel would not impact the existing capacity of PMRF utility systems (i.e., water, sewer, electricity, etc.).
Transportation	The Proposed Action is not expected to alter transportation facilities or traffic patterns of a public roadway. Any changes to traffic associated with the increases in training and testing activities would be limited to the installation boundaries and are not expected to impact the general public.

Resource Area	Justification
Socioeconomics	Proposed activities are consistent with the type of training and testing activities that have historically occurred at PMRF. Although the continuation of these activities would occur at an increased tempo depending on activity, there would not be an increase in stationed personnel associated with the Proposed Action. Therefore, there would be no short-term or long-term impacts on the population or demographics within the Study Area and surrounding area. As a result, proposed activities are not expected to cause a measurable change in the following socioeconomic characteristics: population; availability of affordable housing; accessibility to public services; social conditions linked to population shifts; and economic factors, including employment, income, and spending.
Environmental Justice and Protection of Children (Note: Per EO 14173, issued on January 21, 2025, EO 12898 has been revoked. Per EO 14148, issued on January 20, 2025, EO 13990, EO 14008, and EO 14096 have been revoked.)	Activities associated with the Proposed Action may result in changes in the natural and physical environment (e.g., air quality, greenhouse gases, noise, public health and safety, terrestrial biological resources, and cultural resources); however, these changes are not expected to result in any adverse environmental or health effects. Therefore, there would be no disproportionate or adverse impacts on minority or low-income populations, or children within the Study Area and surrounding area.

Notes: GHG = Greenhouse Gas(es), HAP = Hazardous Air Pollutant, PMRF = Pacific Missile Range Facility, SOP = Standard Operating Procedure

3.1 Air Quality

3.1.1 Definition of Resource

This section describes the air quality in the Study Area and discusses potential adverse effects on air quality that could result from the Proposed Action. Air pollution can damage the health of people, plants, animals, and water bodies as well as the exteriors of buildings, monuments, and statues. It also creates haze or smog that reduces visibility and interferes with aviation. A region's air quality is influenced by many factors, including the type and amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the local meteorological conditions. Ambient air quality is reported as the atmospheric concentrations of specific air pollutants at a particular time and location. The units of measure are expressed as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million by volume).

3.1.2 Regulatory Setting

3.1.2.1 Clean Air Act

Congress passed the CAA in 1970 and its amendments in 1977 and 1990 to improve air quality and reduce air pollution, set regulatory limits on air pollutants, and ensure basic health and environmental protection from air pollution. The CAA applies to U.S. land mass and coastal waters within 3 NM of shore.

3.1.2.1.1 Criteria Pollutants and Ambient Air Quality Standards

Under the CAA, the U.S. Environmental Protection Agency (USEPA) establishes National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. NAAQS have been established for six major pollutants of concern, called "criteria pollutants": carbon monoxide (CO), lead (Pb), nitrogen

dioxide (NO_2), ozone (O_3), sulfur dioxide (SO_2), and coarse and fine particulate matter (with an aerodynamic size less than or equal to 10 microns [PM_{10}] and with an aerodynamic size less than or equal to 2.5 microns [$PM_{2.5}$]). Primary standards provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

Criteria air pollutants are classified as either primary or secondary pollutants. Primary air pollutants are emitted directly into the atmosphere from the source of the pollutant, such as volatile organic compounds (VOCs) emitted by industrial solvents. Secondary air pollutants are those formed through atmospheric chemical reactions. For example, ozone is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (VOC, nitrogen oxides [NO_x], and suspended PM_{10}).

Areas that meet the NAAQS are designated as attainment. Areas with one or more criteria pollutants that exceed the NAAQS are designated as nonattainment. An area may be nonattainment for some pollutants and attainment for others. Nonattainment areas for some criteria pollutants are further classified as marginal, moderate, serious, severe, and extreme, depending on the severity of the air quality problem. An area that was formerly designated as nonattainment but has attained the standard is designated as maintenance. Maintenance areas are subject to a USEPA-approved maintenance plan to ensure continued attainment of the area over two consecutive 10-year periods.

The CAA sections 111 and 112 allow USEPA to transfer primary implementation and enforcement authority for most of the federal standards to state, territory, local, or tribal regulatory agencies. These agencies' authority to implement the CAA requirements is through USEPA-approved State Implementation Plans, or by delegation.

States may establish ambient air quality standards (AAQS) that are more stringent than the NAAQS.

Table 3.1-1 presents the current NAAQS and Hawaii AAQS for criteria pollutants.

Table 3.1-1: National and State Ambient Air Quality Standards

Air Pollutant	Averaging Time	Hawaii Standard	Federal Primary Standard	Federal Secondary Standard
Carbon monoxide (CO)	1-hour	9 ppm	35 ppm	–
	8-hour	4.4 ppm	9 ppm	–
Lead (Pb)	3-month	1.5 µg/m^3 (Calendar quarter)	0.15 µg/m^3	Same as primary
Nitrogen dioxide (NO_2)	1-hour	–	100 ppb	–
	Annual	0.04 ppm	53 ppb	Same as primary
Particulate matter less than or equal to 10 microns in diameter (PM_{10})	24-hour	150 µg/m^3	150 µg/m^3	Same as primary
	Annual	50 µg/m^3	–	–
Particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)	24-hour	–	35 µg/m^3	Same as primary
	Annual	–	9 µg/m^3	15 µg/m^3
Ozone (O_3)	8-hour	0.08 ppm	0.070 ppm	Same as primary
Sulfur dioxide (SO_2)	1-hour	–	75 ppb	–
	3-hour	0.5 ppm	–	–

Air Pollutant	Averaging Time	Hawaii Standard	Federal Primary Standard	Federal Secondary Standard
	24-hour	0.14 ppm	–	–
	Annual	0.03 ppm	–	10 ppb
Hydrogen sulfide (H_2S)	1-hour	25 ppb	–	–

Sources: (U.S. Environmental Protection Agency, 2024b), last updated December 16, 2024 (State of Hawaii Department of Health, 2015).
Notes: ppb = parts per billion, ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter.

3.1.2.1.2 Hazardous Air Pollutants

In addition to the six criteria pollutants, the USEPA currently designates 188 substances as hazardous air pollutants (HAPs) under the federal CAA. HAPs are air pollutants known or suspected to cause cancer or other serious health effects, or adverse environmental and ecological effects (U.S. Environmental Protection Agency, 2016). HAP emissions are typically one or more orders of magnitude smaller than concurrent emissions of criteria air pollutants. NAAQS are not established for these pollutants; however, the USEPA has developed rules and control standards to limit emissions of HAPs from specific stationary and mobile sources. The stationary source HAP regulations are called National Emissions Standards for Hazardous Air Pollutants, codified in 40 CFR parts 61 and 63. These emissions control standards are intended to achieve the maximum degree of reduction in emissions of the HAPs, taking into consideration the cost of emissions control, non-air-quality health and environmental impacts, and energy requirements.

The Mobile Source Air Toxics (MSAT) rules reduce HAPs emitted by mobile sources, such as highway vehicles and non-road equipment, with 21 compounds identified and six compounds specifically identified as having the greatest influence on health: benzene, 1,3 butadiene, formaldehyde, acrolein, acetaldehyde, and diesel particulate matter (U.S. Environmental Protection Agency, 2015). To assess risk from exposure to toxics, the USEPA has tabulated long-term (chronic) and short-term (acute) dose-response assessments that could be used for risk assessments of HAPs (U.S. Environmental Protection Agency, 2024a).

3.1.2.2 Hawaii Air Pollution Control Standards and Regulations

The State of Hawaii Department of Health Clean Air Branch is responsible for air pollution control in the state. Air pollution requirements are implemented through Hawaii Administrative Rules (HAR), Title 11, Chapters 59, Ambient Air Quality Standards, and 60.1, Air Pollution Control. The State of Hawaii has established AAQS for the six criteria pollutants and a state standard for hydrogen sulfide (Table 3.1-1). Hydrogen sulfide was not analyzed in this EA because it is not emitted by any emission source from the Proposed Action. Permits are required for Covered and Noncovered stationary emission sources. Internal combustion engines propelling mobile sources such as automobiles, trucks, construction vehicles and aircraft are exempt from permit requirements.

3.1.3 Approach to Analysis

The generated air emissions are evaluated based on the geographical and spatial locations where emissions occur, as well as pollutants emitted, type of emission source, and levels of emissions. All the air emissions associated with the Proposed Action are expected to occur on land and within 3 NM from shore.

The General Conformity Analysis is not applicable to the Proposed Action because the state of Hawaii is not designated as nonattainment or maintenance for any criteria pollutants.

3.1.3.1 National Environmental Policy Act

Analysis of health-based air quality impacts under NEPA includes estimates of total direct and indirect criteria air pollutants and HAPs emissions from all activities, including aircraft, missiles, or targets released at or below 3,000 feet above mean sea level, or that involve vessels in U.S. territorial seas (within 12 NM). NEPA impacts include those that occur over U.S. land mass and within 3 NM from coastline. Total direct and indirect emissions consider all emission increases and decreases that are reasonably foreseeable and are possibly controllable. The analysis considers the future emissions in the area with the action versus the future emissions without the action (i.e., the Baseline Condition/Affected Environment).

The air quality impact analysis summarizes the emissions estimated for each alternative and provides a qualitative discussion of short-term and long-term impacts of the emissions to air quality. The location and initial dispersion of emissions, duration of exposure, meteorological conditions, wind patterns, buoyancy of pollutants, and other relevant factors are considered and discussed as part of the analysis.

3.1.4 Region of Influence

The region of influence (ROI) for air quality depends on the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. For example, ground-level ozone, a component of smog, is formed in the lower troposphere when its precursor emissions, VOCs, and NO_x, react in the presence of sunlight. Because of the reaction time involved, the highest ozone concentrations often occur far downwind of the precursor emissions.

The ROI for the Proposed Action includes the areas within and downwind of the PMRF training and testing sites and Kaula Island over land or within 3 NM from the coastline.

3.1.5 Affected Environment

3.1.5.1 Meteorological Conditions and Topography of the Study Area

Pollution dispersion in the air is influenced by meteorological conditions, such as wind speed and wind direction, temperature, and atmospheric stability. Wind direction determines the dispersion path pollutants take; higher wind speeds disperse pollutants over a larger area. Lower wind speeds tend to favor a coherent plume. When warmer air traps cooler air near the surface, stable conditions result in slower dispersion, whereas unstable atmospheric conditions can facilitate dispersion. Topography is another factor that influences pollutant dispersion. Urban areas with tall buildings can disrupt wind patterns and downwash plumes to trap pollutants. Mountains and valleys in the absence of an atmospheric inversion can channel air and promote dispersion.

PMRF is located just south of the Tropic of Cancer and has a mild and semi-tropical climate. Typical temperatures for the area are 80–84 degrees Fahrenheit (°F) during the day and 65–68°F during the night. Trade winds are from the northeast and are typically light. Precipitation in the area averages 20 inches annually. Most of the rain falls during the October through April wet season. Figure 3.1-1 depicts wind rose data, for the December 31, 2018, to December 30, 2023, period, collected by the Kekaha weather station at the PMRF airfield, and the location of the weather station relative to the activity areas.

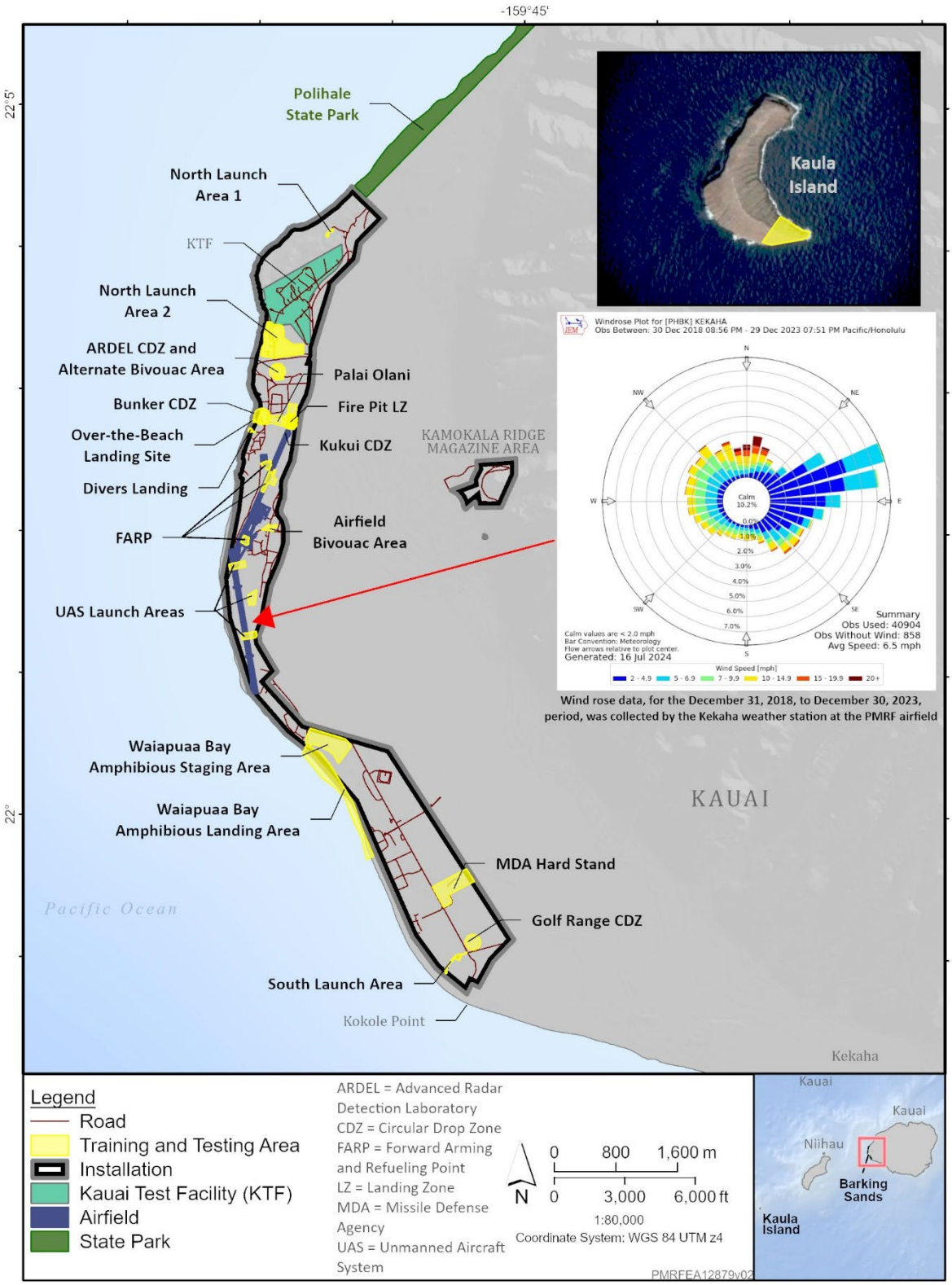


Figure 3.1-1: Kauai Wind Rose and Location Relative to Activity Areas

3.1.5.2 Existing Conditions

Air quality in Hawaii is generally good because of the small number of major stationary sources and strong ventilation provided by frequent trade winds. The State of Hawaii Department of Health, Clean Air Branch plans, operates, and maintains the statewide ambient air quality monitoring network. A Special Purpose Monitoring station on Kauai was established to measure SO_2 from cruise ship emissions. Monitoring for NO_2 and $PM_{2.5}$ on Kauai was discontinued at the site on March 31, 2022 (State of Hawaii Department of Health, 2023). Monitored air pollutant concentrations support the classification of the entire State of Hawaii as attainment for all NAAQS and State AAQS.

The main stationary and portable sources of emissions operated by PMRF include diesel-fueled engines that are used to power generators during training and testing events to provide electricity when demand is high. These engine/generator sets operate under Noncovered Source Permits. Mobile source emissions are generated from aircraft operations, diesel- and gasoline-fueled vehicles, and rocket launches, which are exempt from permitting.

3.1.5.2.1 Receptors

Identification of receptors, including sensitive receptors, is part of describing the existing air quality environment. Sensitive receptors are individuals who are more susceptible to adverse effects of exposure to air pollutants and they are often at hospitals, schools, daycare facilities, elderly housing and convalescent facilities, or other sites. Some of the sites, such as North Launch Areas 1 and 2 are close to public receptors including Polihale State Park and Kokole Point. Other sites, such as Waiapuaa Bay and Unmanned Aircraft System Launch Area are close to an on-base public receptor, Barking Sand Beach Cottages. Kekaha Elementary School is the closest sensitive receptor to the sites. Appendix B (Air Quality Calculations, Table B-23) presents the location and distance of closest public receptor and closest sensitive receptor relative to each site.

3.1.5.3 Sources of Emissions

This analysis considers the increase in direct and indirect criteria pollutants and HAP emissions associated with the Proposed Action. Direct emissions are those emissions caused by the Proposed Action and that occur at the same time and place as the action. This includes emissions from all mobile, area and stationary sources. Indirect emissions are those emissions that are a result of the Proposed Action, but that may occur later in time or may be farther removed in distance from the action itself but that are still reasonably foreseeable. No construction activities are planned as part of the Proposed Action.

For ongoing activities, emissions were estimated for the increase in the tempo or number of events. No new activities are proposed at any of the sites. Conservative operating scenarios (e.g., longest average durations, heaviest vehicles) were used to estimate the emissions. Even though not all locations within the training and testing study areas may be utilized over a given year period, emission estimates assumed that all planned activities would occur each year.

Emission sources vary by activity and by training and testing sites within the Study Area. The following activities would generate criteria pollutants and HAP emissions, primarily generated by the combustion of fuel:

- Military vehicles operations in support of training and testing activities. Depending on the exercise, Joint Light Tactical Vehicles (JLTVs), seven-ton trucks, or Amphibious Combat Vehicles may be used. Estimated emissions include dust generated from vehicle travel on unpaved roads.

- Generators utilized to provide power in support of certain activities. Mobile Electric Power (MEP)-531A 2-kilowatt Military Diesel Generators are expected to be the only generators used, except for missile launch, missiles set up/no launch, and Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting (C5ISRT), which would use 60-kilowatt (kW) generators. It is assumed that all generators are diesel-fueled; the MEP-531A generators meet the USEPA Tier 2 emission standards for Nonroad Compression-Ignition Engines; and the 60 kW generators meet the USEPA Tier 3 emission standards for Nonroad Compression-Ignition Engines.
- Aircraft utilized in support of FARP and Helicopter/Tilt-Rotor Landing Zone operations, Air-to-Ground GUNEX, and Air-to-Ground BOMBEX. Criteria pollutant and HAP emissions were estimated up to 3,000 feet above ground level, which is the default mixing height above which emissions would not affect the ambient air quality.
- Launches or firing of missiles and rockets, and inert munitions. This includes "Smokey Sam" rockets launched from North Launch Area 2 supporting the Electronic Warfare training exercises.
- Emissions from additional personnel travel to training and testing areas.

Table 3.1-2 presents the sources of emissions by area and activity.

Table 3.1-2: Sources of Emissions by Area and Activity

Activity Name	Training & Testing Area	Emission Sources
Missile, Rocket, and Aerial Target Drone Launch	North Launch Area 1 North Launch Area 2	Military Vehicles, combustion emissions and fugitive dust Privately-Owned Vehicles (POV), combustion emissions and fugitive dust Generators Missiles and rockets
Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	North Launch Area 1, North Launch Area 2, and South Launch Area	Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Generators
Artillery	North Launch Area 2	Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Munitions
Amphibious Operations - Raid	Waiapuaa Bay	Landing Craft Air-Cushioned (LCAC) Amphibious Combat Vehicle (combustion emissions and fugitive dust)
Amphibious Operations - Small Boat Operations	Waiapuaa Bay and the Divers Landing Area	Combat Rubber Raiding Craft (CRRC)
Amphibious Operations - Swimmer Insertion/Extraction)	Waiapuaa Bay, Divers Landing area, and the Over-the-Beach Landing area	POV, combustion emissions and fugitive dust

Activity Name	Training & Testing Area	Emission Sources
Forward Arming and Refueling Point Operations	Airport Aircraft Parking Area - Forward Arming and Refueling Point Areas	Aircraft (takeoffs and landings and operation during refueling) Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Generators Negligible fugitive VOC emissions from JP-8 refueling
Small Unmanned Aircraft Systems (sUAS) and Counter-Unmanned Aircraft Systems Operations	Airfield – sUAS Launch and Recovery Areas	Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Generators
Parachute Operations	Palai Olani (ARDEL CDZ, Bunker CDZ, Golf Range CDZ, and Kukui CDZ)	POV, combustion emissions and fugitive dust
Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting	North Launch Area 1	Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Generators
	North Launch Area 2	
	South Launch Area	
	MDA Hard Stand	
Bivouac (unit, medium, large)	Bivouac Area 1	Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust Generators
	MDA Hard Stand	
	Palai Olani	
	North Launch Area 1	
	Alternate Bivouac Area (ARDEL)	
Air-to-Ground Gunnery Exercise	Kaula Island	Inert Munitions Rotary wing aircraft (takeoffs and landings and hover)
Air-to-Ground Bombing Exercise	Kaula Island	Inert Munitions
Helicopter/Tilt-Rotor Landing Zone Operations	Fire Pit LZ	Aircraft (takeoffs and landings and operation with Engines on, on deck or above LZ Fire Pit) Military Vehicles, combustion emissions and fugitive dust POV, combustion emissions and fugitive dust

3.1.6 Environmental Consequences

Effects on air quality are based on estimated increases in direct and indirect emissions associated with implementation of the Proposed Action. The expected areas of impact from air pollutants released by the Proposed Action are downwind of the activities over land or within 3 NM from the Kauai coastline.

The impact analysis includes direct effects from the proposed change in training or testing activities (such as increase in generator operations or movement of a launch system or troops to launch location) and indirect effects (such as personnel travel to the sites) as well as cumulative effects. It does not include airfield operations conducted at the PMRF airfield, except for takeoff and landing in support of FARP, Helicopter/Tilt-Rotor Landing Zone Operations, and Air-to-Ground GUNEX and BOMBEX on Kaula Island. In addition, effects associated with land-based training and testing activities in the water (e.g., land-based missile launch towards a target at sea) have been previously analyzed in prior relevant NEPA documentation (see Table 1.6-1 for a list of documents incorporated by reference).

3.1.6.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities, described in Table 2.1-1, and these activities would continue to occur within the same designated areas as previously analyzed in relevant environmental documentation listed in Table 1.6-1. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training and testing areas. Therefore, no increases in air quality impacts from activities would occur as a result of the No Action Alternative.

3.1.6.2 Proposed Action

This section discusses the potential short-term and long-term effects on air quality that could result from implementation of the Proposed Action. The criteria pollutant and HAP emissions all occur within 3 NM from shore.

Table 3.1-3 presents a summary of pollutant emissions for Barking Sands and Kaula Island. Detailed emissions, by site, are presented in Appendix B (Air Quality Calculations). The calculations conservatively assume that the proposed activities all occur within the same year at their highest average tempo and maximum number of personnel. For example, the typical duration of C5ISRT events is between 3 and 10 days. The analysis assumes all but one annual event occurs over a 10-day period, and one annual event is 60 days in duration. Similarly, the Missile, Rocket, Aerial Target Drone Launch activities are modeled as three-day events except for one annual event with a 40-day duration. Most of the emissions are due to generator operations and dust generated by military vehicles and personnel travel to the sites where C5ISRT events, Missile, Rocket, Aerial Target Drone Launch, and Bivouac activities are planned.

Table 3.1-3: Increase in Criteria Pollutant Emissions

Site/Emissions	Total Emissions, ton/year					
	NO_x	SO_x	CO	VOCs	PM_{10}	$PM_{2.5}$
Barking Sands	31.24	8.05	70.05	10.18	164.54	21.56
Kaula Island	0.31	0.01	2.68	0.81	0.20	0.20
Total	**31.55**	**8.06**	**72.73**	**10.99**	**164.74**	**21.76**

For the Proposed Action, HAPs are primarily generated, in addition to criteria air pollutants, by combustion of fuels. Table 3.1-4, Table 3.1-5, and Table 3.1-6 present the estimated increase in total HAPs of concern, grouped based on their potential cancer, non-cancer chronic and acute health impacts, which would be emitted under the Proposed Action. Similar to criteria pollutant emissions, HAP emissions were also calculated based on conservative assumptions. For example, hourly HAP emissions

were calculated assuming that all activities would occur within the same hour over the span of 13 days per year, which is the average duration of activities.

Table 3.1-4: Estimated Increase in Total Carcinogenic HAP Emissions

Pollutant	Total, ton/year	Main Contributing Activity
1,3 Butadiene	0.0218	Personnel Commute to Sites
Acetaldehyde	0.0249	
Benzene	0.0887	
Ethylbenzene	0.0385	
Formaldehyde	0.0514	
Propanal (Propionaldehyde)	0.0017	

Table 3.1-5: Estimated Increase in Total Non-Cancer Chronic HAP Emissions

Pollutant	Total, ton/year	Main Contributing Activity
Acetaldehyde	0.0249	Personnel Commute to Sites
Benzene	0.0887	
Ethylbenzene	0.0385	
Formaldehyde	0.0514	
Hexane	0.0361	
Toluene	0.1883	
Styrene	0.0307	
Xylenes	0.1521	

Table 3.1-6: Estimated Increase in Total Non-Cancer Acute HAP Emissions

Pollutant	Total, lb/hour	Main Contributing Activity
Acetaldehyde	3.84	Personnel Commute to Sites
Benzene	13.64	
Formaldehyde	7.91	
Hexane	5.55	
Propanal (Propionaldehyde)	0.27	
Toluene	28.97	
Styrene	4.72	
Xylenes	23.39	

Criteria pollutants and HAP emissions would be generated during launch activities and while using systems, vehicles, generators, and other necessary equipment during training and testing activities. There would be no permanent or continuously emitting sources of criteria pollutant emissions associated with the Proposed Action.

Figure 3.1-2 presents the locations of closest receptors to the sites. Some sensitive receptors, such as Polihale State Park and Kokole Point, are close to some of the sites as discussed below.

Vehicle criteria pollutant and HAP emissions are short term (i.e., lasting less than 24 hours). At the highest average operational tempo (e.g., 40 days and 60 days per event for some launch and C5ISRT

events, respectively), approximately 62,000 military vehicle miles traveled are estimated at Barking Sands annually from increased activities. As a conservative estimate, approximately 4 million vehicle miles represent the increased personnel travel distance associated with the Proposed Action. Emissions from vehicles operations are expected to initially rise in the immediate vicinity of the activity; however, wakes developed from wind flowing past the equipment body or equipment in motion cause downwash of the exhaust plume. Downwash is expected to overcome any plume rise that could have resulted from buoyancy and momentum and increase ground-level concentrations.

Generator sets are used in some of the areas in support of training and testing exercises. The criteria pollutant and HAP emissions generated from the diesel engines powering these generators could last several hours over a period of several days, depending on the exercise. Some of the sites, including North Launch Area 1 and South Launch Area, are relatively close to sensitive receptors, such as Polihale State Park and Kokole Point. The prevailing northeasterly winds would help to disperse the emissions generated at North Launch Area 1 toward the ocean and away from the state park while during other periods, emissions would be transported toward Polihale State Park. Kokole Point is downwind of the South Launch Area where human exposure to emissions could occur. However, given the distance (approximately 0.2 mi.) and the magnitude of the emissions, occurring infrequently, any impact is expected to be minor. These emissions are not expected to cause any discernable increase in human health risks from HAP exposure in areas where public presence is expected. For all other sites, the prevailing northeasterly winds would help to disperse the emissions away from the receptors while during other periods, emissions would be transported toward the receptors. However, the magnitude of emissions, occurring infrequently, are low enough that only minor impacts would be expected.

Due to the relatively low criteria pollutant and HAP emissions, occurring infrequently and given the distance to downwind receptors, emissions are not expected to interfere with the attainment of AAQS or cause any discernable increase to human health risks from HAP exposure in areas where public presence is expected.

Therefore, air quality impacts would be less than significant as a result of implementation of the Proposed Action.

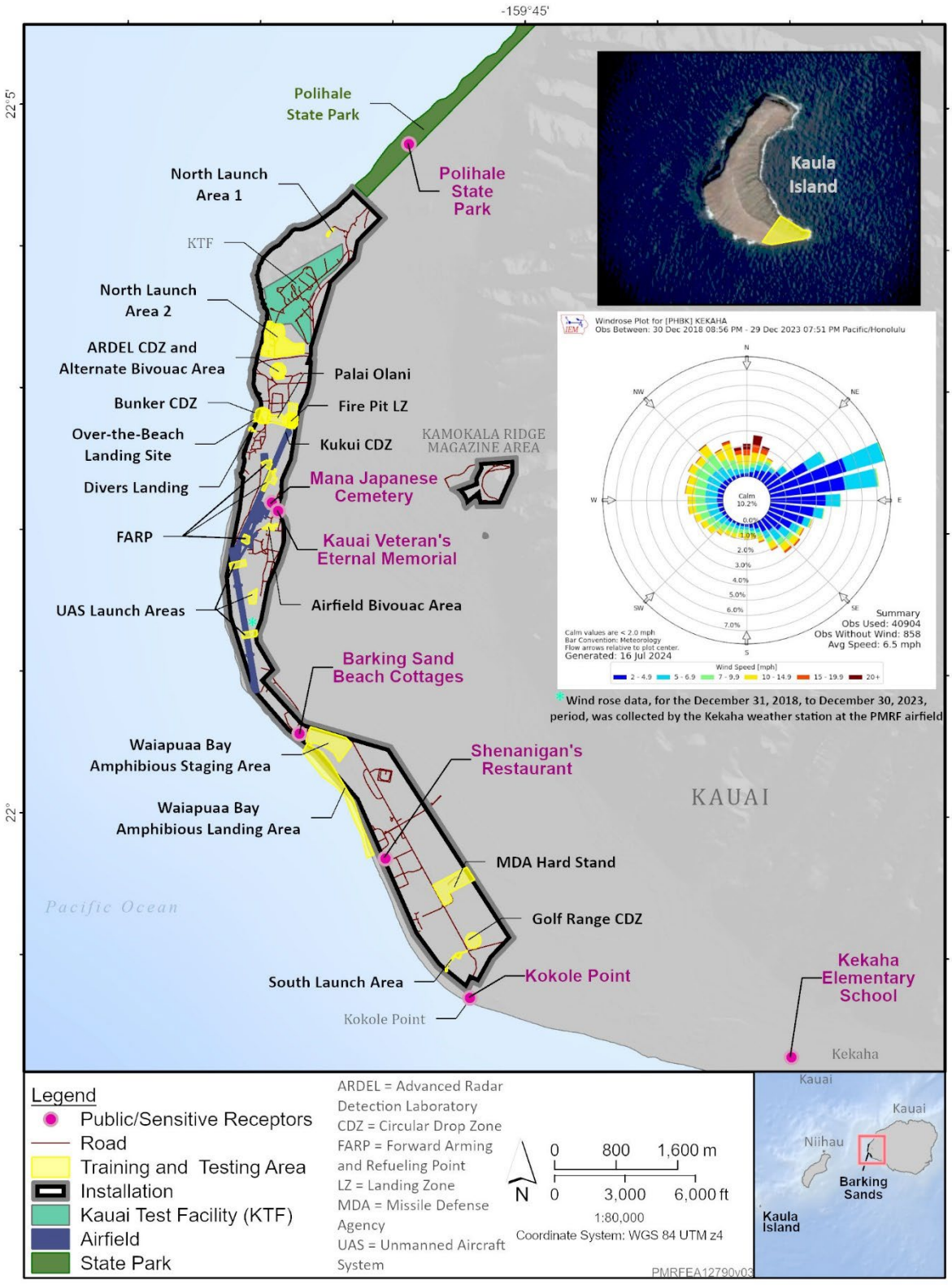


Figure 3.1-2: Proximity of Nearest Receptors to the Sites

3.2 Greenhouse Gases

3.2.1 Definition of Resource

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. These emissions are generated by both natural processes and human activities. The accumulation of GHGs in the atmosphere helps regulate the earth's temperature. GHGs include water vapor, carbon dioxide, methane, nitrous oxide, ozone, and several hydrocarbons and chlorofluorocarbons. Each GHG has an estimated global warming potential, which is a function of its atmospheric lifetime and its ability to absorb and radiate infrared energy emitted from the earth's surface.

3.2.2 Regulatory Setting

The USEPA specifically identified carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride as GHGs (U.S. Environmental Protection Agency, 2009) (74 Federal Register [FR] 66496). These gases influence global climate by trapping heat in the atmosphere that would otherwise escape to space. Increased concentrations of these gases due to human activities is the primary cause of global warming observed over the last 70 years (National Resource Council, 2020). GHGs have varying global warming potential (GWP). GWP is a measure of how much energy the emissions of 1 ton of a gas absorb over a given period of time (usually 100 years), relative to the emissions of 1 ton of CO_2 (U.S. Environmental Protection Agency, 2023a).

3.2.2.1 State of Hawaii Greenhouse Gas Program

The State of Hawaii Department of Health established the Hawaii GHG Program to reduce GHG emissions. Act 15 of the 2018 Legislature established a statewide carbon net-negative goal by 2045. Act 238 of the 2022 Legislature established a goal for the level of statewide GHG emissions to be at least 50 percent below 2005 levels by the year 2030 (including airplane emissions). The program utilizes the Air Pollution Control Permit process of the Clean Air Branch to regulate GHG emissions statewide.

On June 30, 2014, HAR, Chapter 11-60.1 was amended to adopt the new Hawaii GHG program. The main requirements of the program are set forth in Subchapter 11, Greenhouse Gas Emissions. To reduce GHGs, the rules specify a 16 percent GHG emission cap for large existing stationary sources ("affected sources") with potential carbon dioxide equivalent (CO_2e) emissions at or above 100,000 tons per year. Each affected source must submit a GHG emission reduction plan for establishing measures used to meet the emission cap.

3.2.3 Analysis Framework

The Proposed Action is anticipated to release GHGs into the atmosphere. These emissions are quantified for the Proposed Action and compared to the No Action Alternative.

3.2.4 Region of Influence

The ROI for GHG is the global atmosphere.

3.2.5 Affected Environment

3.2.5.1 Existing Conditions

Global GHG in 2022 reached a high of 53.85 billion metric tons (MT) of CO_2e (Ritchie et al., 2020). CO_2e is a measurement of the total greenhouse gases emitted, expressed in terms of the equivalent

measurement of carbon dioxide. As shown in Table 3.2-1, in 2021, the U.S. emitted over 6,300 million MT of CO_2e.

Table 3.2-1: Trends U.S. Greenhouse Gas Emissions, Million MT CO_2e

Economic Sector	2017	2018	2019	2020	2021
Industry	1,973.9	2,033.2	2,011.2	1,852.9	1,909.2
Transportation	1,846.0	1,876.2	1,879.2	1,629.2	1,809.5
Commercial	1,060.4	1,074.5	1,029.7	930.5	972.2
Residential	962.3	1,034.9	982.0	918.3	953.8
Agricultural	693.0	709.8	690.7	671.5	671.5
U.S. Territories	26.3	26.3	25.1	23.6	24.1
Total	6,561.8	6,754.8	6,617.9	6,026.0	6,340.2

Source: (U.S. Environmental Protection Agency, 2023b)
Note: Numbers may not add up exactly due to rounding.

In 2019, total GHG emissions in Hawaii were 22.01 million MT of CO_2e. Net emissions, including carbon sinks, were 19.42 million MT CO_2e. Emissions from the Energy sector accounted for 88.4 percent of total emissions in Hawaii, followed by the Agriculture, Forestry, and Other Land Use sector at 6.0 percent, the Industrial Processes and Product Use sector at 3.8 percent, and the Waste sector at 1.9 percent. In 2019 Kauai County accounted for 4.4 percent of the total emissions, with 77.6 percent of Kauai County emissions attributed to the Energy sector (Hawaii State Department of Health, 2023).

3.2.5.2 Sources of Emissions

The following activities would generate GHG emissions, primarily by the combustion of fuel.

- Military vehicles operations in support of training and testing activities. Depending on the exercise, JLTVs, 7-ton trucks, or Amphibious Combat Vehicles may be used.
- Generator utilized to provide power in support of certain activities. MEP-531A 2-kilowatt Military Diesel Generators are expected to be the only generators used, except for missile launch, missiles set up/no launch, and C5ISRT, which would use 60-kW generators.
- Aircraft utilized in support of FARP and Helicopter/Tilt-Rotor Landing Zone operations, Air-to-Ground GUNEX, and Air-to-Ground BOMBEX. GHG emissions were estimated for all altitudes, as applicable.
- Launches or firing of missiles, rockets, and munitions.
- Personnel travel to training and testing areas.

3.2.6 Environmental Consequences

Increasing concentrations of GHG in the atmosphere is a global issue. GHG emissions generated from the Proposed Action contribute to and could potentially affect the global atmosphere, regardless of the specific location within the ROI that they are produced. Table 3.2-2 presents the increase in GHG emissions that would result from implementing the Proposed Action.

Table 3.2-2: Increase in GHG Emissions, CO_2e (MT) Per Year

Source Type	Emissions Increase, CO_2e (MT) per year
Generators	2,192
Aircraft	3,353
Privately Owned Vehicles	1,702
Vessels (within 3 NM)	268
Military Vehicles	76
Missiles, Rockets, and Munitions	11
Total	**7,602**

3.2.6.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities, described in Table 2.1-1, and these activities would continue to occur within the same designated areas as previously analyzed in relevant environmental documentation listed in Table 1.6-1. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training and testing areas. Therefore, no additional impacts on greenhouse gases would occur as a result of the No Action Alternative.

3.2.6.2 Proposed Action

The Proposed Action would increase GHG emissions by 7,602 MT of CO_2e per year as compared to the No Action Alternative. The estimated GHG emissions are comparable to approximately 1,653 cars per year on the road, as a typical passenger vehicle emits approximately 4.6 tons of CO_2 per year. The emissions are equivalent to 0.00001 percent of the global GHG emissions, approximately 0.0001 percent of the reported U.S. Emissions in 2021, and approximately 0.03 percent of the 2019 GHG emissions reported for Kauai County. Expected GHG emissions are relatively minor and make up a negligible percentage of the global GHG emissions. Therefore, greenhouse impacts would be less than significant as a result of implementation of the Proposed Action.

3.3 Noise

3.3.1 Definition of Resource

Noise is defined as unwanted or annoying sound that interferes with or disrupts normal human activities. Although continuous and extended exposure to high noise levels (e.g., through occupational exposure) can cause hearing loss, the principal human response to noise is annoyance. The response of different individuals to similar noise events is diverse and is influenced by the type of noise, perceived importance of the noise, its appropriateness in the setting, time of day, type of activity during which the noise occurs, and sensitivity of the individual. Potential impacts on biological species from noise are discussed in Section 3.5 (Terrestrial Biological Resources).

The loudest sounds that can be detected comfortably by the human ear have intensities that are a trillion times higher than those of sounds that can barely be detected. This vast range means that using a linear scale to represent sound intensity is not feasible. The decibel (dB) is a logarithmic unit used to represent the intensity of a sound, also referred to as the sound level. All sounds have a spectral content, which means their magnitude or level changes with frequency, where frequency is measured in

cycles per second or Hz. To mimic the human ear's non-linear sensitivity and perception of different frequencies of sound, the spectral content is weighted. For example, environmental noise measurements are usually on an "A-weighted" scale that filters out very low and very high frequencies in order to replicate human sensitivity. It is common to add the "A" to the measurement unit in order to identify that the measurement has been made with this filtering process (A-weighted decibels [dBA]). In this document, the dB unit refers to A-weighted sound levels. Table 3.3-1 provides a comparison of how the human ear perceives changes in loudness on the logarithmic scale.

Table 3.3-1: Subjective Responses to Changes in A-Weighted Decibels

Change	Change in Perceived Loudness
3 dB	Barely perceptible
5 dB	Quite noticeable
10 dB	Dramatic – twice or half as loud
20 dB	Striking – fourfold change

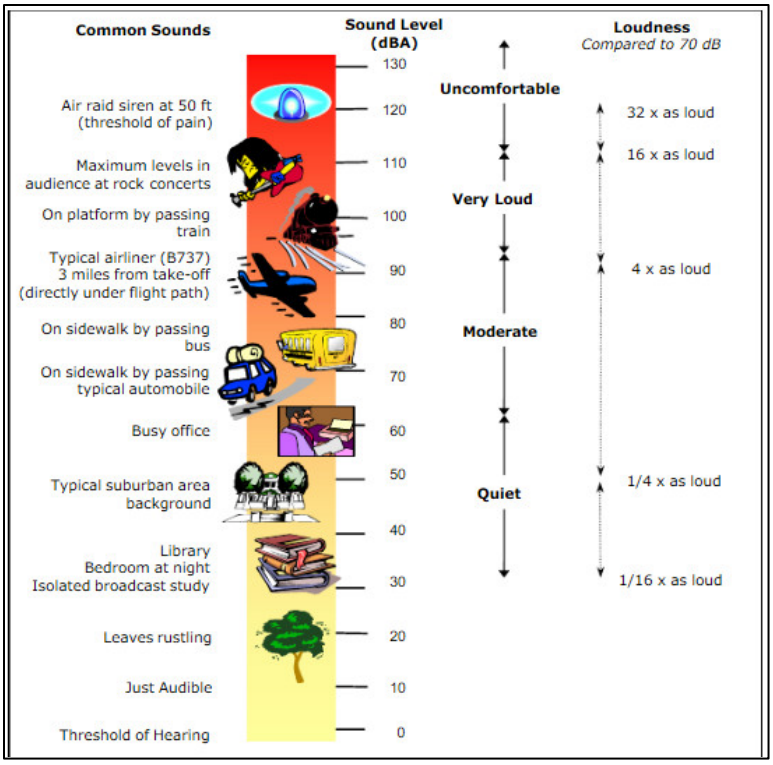
Note: dB = decibel(s)

Figure 3.3-1 provides a chart of A-weighted sound levels from typical noise sources. Some noise sources (e.g., air conditioner, vacuum cleaner) are continuous sounds that maintain a constant sound level for some period of time. Other sources (e.g., automobile, heavy truck) are the maximum sound produced during an event like a vehicle pass-by. Other sounds (e.g., urban daytime, urban nighttime) are averages taken over extended periods of time.

3.3.2 Regulatory Setting

3.3.2.1 Noise Control Act

The Noise Control Act of 1972, as amended, directs all federal agencies to carry out programs within their jurisdiction in a manner that promotes an environment free from noise that jeopardizes health and welfare, to the fullest extent within agency authority.



Source: Cowan (1994)

Figure 3.3-1: A-Weighted Sound Levels from Typical Sources

3.3.2.2 Federal Interagency Committee on Urban Noise

The federal government suggests land-use compatibility criteria for different noise zones; however, land use compatibility is regulated at the local level. Based on the guidelines in the Federal Interagency Committee on Urban Noise guidelines (Federal Interagency Committee on Urban Noise, 1980), residential areas and schools are considered compatible where the Day-Night average sound level (DNL) is less than or equal to 65 dBA. Outdoor recreational activities are compatible with noise levels less than or equal to 70 dBA. Parks are compatible with noise levels less than or equal to 75 dBA (Federal Interagency Committee on Urban Noise, 1980).

3.3.2.3 United States Environmental Protection Agency Noise Standards

The USEPA determined a 24-hour exposure level of 70 dB as the level of environmental noise at which no measurable hearing loss would be expected to occur over a lifetime (U.S. Environmental Protection Agency, 1974). This exposure level is also the threshold for hearing loss avoidance.

3.3.2.4 U.S. Occupational Safety and Health Administration

Title 29 of the CFR contains the principal set of rules and regulations from the U.S. Occupational Safety and Health Administration issued by federal agencies regarding occupational noise exposure. Specifically, regulations and standards governing general industry are provided in 29 CFR Part 1910.95.

3.3.3 Approach to Analysis

3.3.3.1 Noise Metrics

A metric is a system for measuring or quantifying a particular characteristic of a subject. Since noise is a complex physical phenomenon, multiple noise metrics help to quantify the noise environment more accurately. The noise metrics used in this EA are summarized below.

3.3.3.2 Day-Night Average Sound Level

The DNL metric is the energy-averaged sound level measured over a 24-hour period, with a 10 dB penalty assigned to noise events occurring between 10 p.m. and 7 a.m. (acoustic night). DNL values are average quantities, mathematically representing the continuous sound level that would be present if all variations in sound level that occur over a 24-hour period were averaged to have the same total sound energy. DNL is the standard noise metric used by the U.S. Department of Housing and Urban Development, Federal Aviation Administration (FAA ATO NAS Analytics - AJV-W25), USEPA, and the DoD. Most people are exposed to sound levels of 50–55 DNL or higher on a daily basis. Research indicates about 87 percent of the population is not highly annoyed by outdoor sound levels below 65 dB DNL (Federal Interagency Committee on Urban Noise, 1980).

3.3.3.3 Equivalent Sound Level

The Equivalent Sound Level, measured in dB, is a cumulative noise metric that represents the average sound level (on a logarithmic basis) over a specified period of time—for example, an hour, a school day, daytime, nighttime, weekend, facility rush periods, or a full 24-hour day (the equivalent sound level for a full 24-hour day is similar to the DNL metric but for the fact that the DNL metric includes the additional 10 dB for those events during acoustic night).

3.3.3.4 Noise Effects

Some studies have linked increases in noise with human health effects, such as hearing impairment, sleep disturbance, cardiovascular effects, and psychophysiological effects (U.S. Army Corps of Engineers, 2012; van Kempen et al., 2002). Both short- and long-term exposure to very loud noises and long-term exposure to lower levels of sound (chronic exposure) can affect health. Damage to hair cells of the cochlea (the auditory portion of the inner ear) and hearing impairment can be caused by acute exposure to sounds greater than 120 dB (Babisch, 2005; Goelzer et al., 2001).

3.3.3.5 Propagation of Sound in the Environment

In an ideal setting in which sound propagates away from a point source in air without any outside influence (e.g., a barrier reflecting or attenuating the sound), sound energy radiates uniformly outward in all directions from the source in a pattern referred to as spherical spreading (noise in relation to biological resources, as well as how sound propagates in water, is discussed in Section 3.5, Terrestrial Biological Resources). As sound energy propagates away from the sound source, both the sound level and frequency change. For each doubling of distance from the source, the sound level attenuates (or drops off) at a rate of 6 dBA.

When a sound is not from a single point source but is instead from multiple sources along a line, like the noise made by the continuous movement of vehicles on a highway, the source of the sound appears to emanate from a linear source rather than from a point source. The sound level from a linear source decreases by approximately 3–4 dBA with a doubling of the distance from the source (Goelzer et al., 2001).

In a real-world setting, a number of factors can influence how sound propagates in the environment; the ideal case of spherical spreading is an approximation of reduction with distance. Wind is the single most important meteorological factor within approximately 500 feet of the sound source, while vertical air temperature gradients are more important in sound propagation over longer distances. Other atmospheric conditions such as air temperature, humidity, and turbulence also can have a major effect on received sound levels.

Whether natural or man-made, a large object or barrier in the path between a sound source and a receptor can reduce sound levels substantially. The impact of this shielding depends on the size and material of the object as well as the frequency content of the sound source. Natural terrain, buildings, and walls can serve as noise barriers, often reducing sound levels by 5–10 dB.

3.3.4 Region of Influence

For the purposes of the noise analysis, based on the types of activities and resources present, the ROI is comprised of two main areas (Figure 2.1-1):

- Barking Sands (North Launch Area 1, North Launch Area 2, South Launch Area, Palai Olani Area, Waiapuaa Bay Amphibious Staging Area, MDA Hard Stand, Airfield Bivouac Area, Alternate Bivouac Area, FARP Areas, UAS Launch Area, and Ground Maneuver Areas) (Figure 2.1-2 through Figure 2.1-11)
- Kaula Island (Figure 2.1-12)

Defining the ROI for each particular location is based on knowledge of the type of noise-generating activities, noise levels of equipment, length of time the noise would be generated, and proximity to human sensitive noise receptors, such as multi- and single-family residences, parks, churches, schools, and outdoor recreational areas.

3.3.5 Affected Environment

3.3.5.1 Barking Sands

Primary noise sources at Barking Sands include airfield and range operations and missile, rocket, and drone launches. Airfield operations include takeoffs and landings of high performance and cargo/passenger aircraft (such as KC-130, FA-18, F-35, and P-8) as well as tilt-rotor or helicopter operations (such as MV-22, CH-47, and AH-64). Range operations include training and research and development activities support. Ambient noise levels from natural sources include wind, surf, and wildlife. The nearest off-base residential area is Kekaha, which is approximately 8 mi. south of the northern launch areas and 2 mi. from the southern launch sites.

Noise generated at the PMRF airfield is from one active runway, four helicopter operating spots, and maintenance operations. Noise levels produced by airfield operations tend to be relatively continuous. Existing noise levels near the runway may average as high as 75 dBA. Noise levels farther away from the runway are more characteristic of a commercial park, with levels not exceeding 65 dBA. In 2020, an Air Installations Compatible Use Zone (AICUZ) study was conducted to evaluate and document the impact of noise from military operations at PMRF on the surrounding community. The primary purpose of the AICUZ study is to ensure the safety and welfare of the public while maintaining the operational capabilities of the military installation. The study analyzed noise contours and identified land use compatibility issues to help guide local planning and zoning decisions to prevent incompatible development near PMRF. The 2020 PMRF AICUZ study specifically focused on updating noise exposure

maps and assessing the potential impacts of noise on nearby residential areas, recreational spaces, and other human sensitive noise receptors.

In the AICUZ study, noise zones are used to determine the compatibility of various land uses around military airfields. Noise Zone I (below 65 dB DNL) is generally considered compatible with most land uses, including residential areas, schools, and hospitals. Noise Zone II (65-75 dB DNL) requires more careful land use planning, where less noise-sensitive uses such as industrial, commercial, and certain recreational activities are preferred.

Noise contours presented in the Navy's 2020 AICUZ Study Update represent the projected 2025 flight operations and generated contours (in 5 dB increments from 60 dB to greater than 75 dB) based on all flight activities at PMRF airfield (Naval Facilities Engineering Command Southwest, 2020). The 2020 PMRF AICUZ study determined that noise levels within the most affected areas, particularly Noise Zone II (65-75 dB DNL), are largely contained within the installation boundary with minimal off-base impact (Table 3.3-2). The analysis indicates that the nearest residential areas and other sensitive land uses are either outside the significant noise impact zones or subject to noise levels comparable to existing ambient conditions. The study did find that the 60 to 65 dB DNL noise zone affects 38 acres off-base; however, this land is vacant and not populated. Consequently, the study confirms that military activities at PMRF do not substantially elevate noise levels or adversely affect the quality of life in the surrounding community.

Table 3.3-2: DNL Footprint

DNL Noise Contour (dB)	On-Base (acres)	Off-Base (acres)		Total
		Over Water	Over Land	
60–65	140	995	38	1,173
65–70	115	481	9	606
70–75	99	57	-	156
> 75	25	1	-	26
Total	**379**	**1,535**	**47**	**1,961**

The activity with the most noticeable sound events is the launch of missiles, rockets, drones, and artillery firing events. Launches and artillery firing events result in high-intensity, short-duration sound events. Typical launches at Barking Sands (including KTF launch sites) include Strategic Target System, Terminal High Altitude Area Defense, NMESIS, Mid-Range Capability (MRC), and High Mobility Artillery Rocket System (HIMARS) launches (see Appendix A, Military Readiness Activity Descriptions). These launch activities have not resulted in public noise complaints. Each missile launch generates individual acoustical events that are very loud near the launch pad, but they attenuate rapidly with distance. For example, noise levels for the strategic target system launch at a distance of 575 feet was 125.3 dB, but less than 98 dB at a distance of 10,000 feet (U.S. Department of the Navy, 2008a). However, these events are relatively short in duration, non-impulsive, and lasting approximately 5–10 seconds each. Noise levels generated by each test vary, depending on missile system configuration, trajectory, and weather conditions. Similarly, artillery firing events are very loud (up to 181 dB) at the firing location but attenuate rapidly with distance, with received noise levels less than 115 dB at a distance of 10,000 feet.

In general, noise during the launches and in flight soon after launch as well as artillery firing events are clearly audible to nearby areas both on and off Barking Sands. None of the noise levels outside the ground hazard areas, where non-essential personnel and the public are excluded, exceed either DoD or

Occupational Safety and Health Administration's safety requirements. Data collected in the nearest town, Kekaha (Figure 3.3-2), indicated that launch levels were no louder than noise generated from passing vehicles on a nearby highway. For the larger launch systems described above, recorded noise levels in Kekaha were noted at 54 dB (U.S. Department of the Navy, 2008a). For artillery firing events, while noise at the firing source (North Launch Area 2) during the training activity can reach levels up to 181 dB, the received noise levels from this impulsive event in the Kekaha area reach up to 104 dB. However, artillery guns are oriented such that the artillery round is shot directly toward the open ocean, all within PMRF's restricted airspace, which reduces the received noise levels by 5 dB, below 99 dB. At a received noise level of 99 dB, a single firing event lasting less than a second, or even a series of multiple firing events lasting several seconds or minutes, would not elevate community DNL levels in the Kekaha area above 65 dB.

No noise-sensitive land uses are affected by existing noise levels.

3.3.5.2 Kaula Island

Kaula Island is located over 52 NM from Barking Sands. The southern 1,000 feet of the island is used for inert bombing and gunnery training. While no noise level data collection has occurred on Kaula Island, inert munition impact, weapons firing, and aircraft noise are likely the primary military-related noises at this location. There are no human sensitive noise receptors on Kaula Island; refer to Section 3.5.5.2 (Proposed Action) for the analysis of noise impacts on biological resources.

3.3.6 Environmental Consequences

When evaluating noise effects, several aspects are examined, including (1) the degree to which noise levels generated by training and operations would be higher than the ambient noise levels, (2) the degree to which there would be hearing loss or annoyance, and proximity of human sensitive noise receptors (e.g., residences, schools, hospitals, parks) to the noise source. An environmental analysis of noise includes the potential effects on the local population and estimates the extent and magnitude of the noise generated by the Proposed Action.

3.3.6.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation listed in Table 1.6-1. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training and testing areas. Noise levels would remain the same with no increase. Noise would continue to be sporadic, intermittent across all training and testing locations. Therefore, no significant impacts on noise would occur as a result of implementation of the No Action Alternative.

3.3.6.2 Proposed Action

3.3.6.2.1 Barking Sands

Under the Proposed Action, there would be no changes in the type of land-based training and testing activities that currently occur at Barking Sands; however, the continuation of these activities would occur at increased numbers depending on the activity type. The majority of training and testing activities described in Chapter 2 (Description of Proposed Action and Alternatives) are not significant noise-generating activities. Some activities generate noise from use of military vehicles and equipment, such as missile launcher setup, C5ISRT setup activities, and large unit bivouacking that could result in temporary noise levels between 74 and 90 dBA at a distance of 50 feet (Washington State Department

of Transportation, 2020). However, noise levels from training and testing activities would quickly attenuate with increasing distance. A 90 dB noise at 50 feet would propagate outward, but the received noise level would decrease with increased distance from the source. At a distance of 1,000 feet from the activity, the received noise level would be below 65 dB. As described above, the nearest human sensitive noise receptors are residences, located approximately 10,000 feet (about 2 miles) south of the western edge of Barking Sands, in the community of Kekaha (Figure 3.3-2). Due to this distance, noise from almost all land-based training and testing activities, even with an increase in training and testing, is anticipated to be inaudible and would not meaningfully change DNL levels near human sensitive noise receptors.

The Proposed Action includes an increase in aircraft activities. As noted in Chapter 2 (Description of Proposed Action and Alternatives), the Navy proposes FARP Operations as well as Helicopter/Tilt-Rotor Landing Zone Operations at the Fire Pit Landing Zone. Both the FARP and Landing Zone locations (Figure 2.1-1) are located near or adjacent to the existing four helicopter operating spots. The majority of aircraft operations associated with both FARP and Landing Zone include the MV-22. Approach/landing noise for the MV-22 has been documented at approximately 83 dB at a distance of 500 feet (U.S. Marine Corps, 2012). As these activities are adjacent to the airfield and would be flying in a concentrated area, it is unlikely that the DNL contours would expand greatly. As with propagation loss, the received noise level would be below 65 dB at a distance of 4,000 feet from the activity. Additionally, the closest of FARP and Landing Zone areas to the nearest sensitive noise receptor, Kekaha, is over 5.3 mi. away (Figure 3.3-2). Received noise levels in the community of Kekaha would be less than 50 dB. As such, aircraft operations associated with proposed FARP and the Landing Zones could be audible but would not significantly contribute to the noise environment at nearby human sensitive noise receptors.

Activities with the most noticeable sound events are the launch of missiles and rockets at North Launch Area 1 and North Launch Area 2, and howitzer artillery firing at North Launch Area 2. As previously discussed, launches would result in high-intensity, non-impulsive short-duration sound events lasting approximately 5–10 seconds each. While received noise levels from a missile launch at North Launch Area 1 and North Launch Area 2 could create a brief noise event in Kekaha ranging between 82 and 94 dB, it would only minimally influence the community noise levels (e.g., DNL) in the Kekaha area because of the extremely short duration.

Artillery firing activities are proposed to increase from one to three annual activities (up to 300 rounds per four-day activity) at North Launch Area 2, which is approximately 6.5 mi. north of the Kekaha area. Although the number of firing events increases under the Proposed Action, a single firing event lasting less than a second, or even a series of multiple firing events lasting several seconds or minutes, would not elevate community DNL levels in the Kekaha area above 65 dB.

Given the sound environment in Kekaha, launch or firing noise would be higher than typical ambient levels but would be comparable to a large truck passing by on the road or low-altitude airplane overflight. Most launch and firing events are short in duration, distributed over time, and have minimal contribution to DNL levels. Therefore, an increase of launches from any launch area at Barking Sands (as shown in Table 2.1-1) or artillery firing activities, while audible, would not significantly degrade the noise environment.

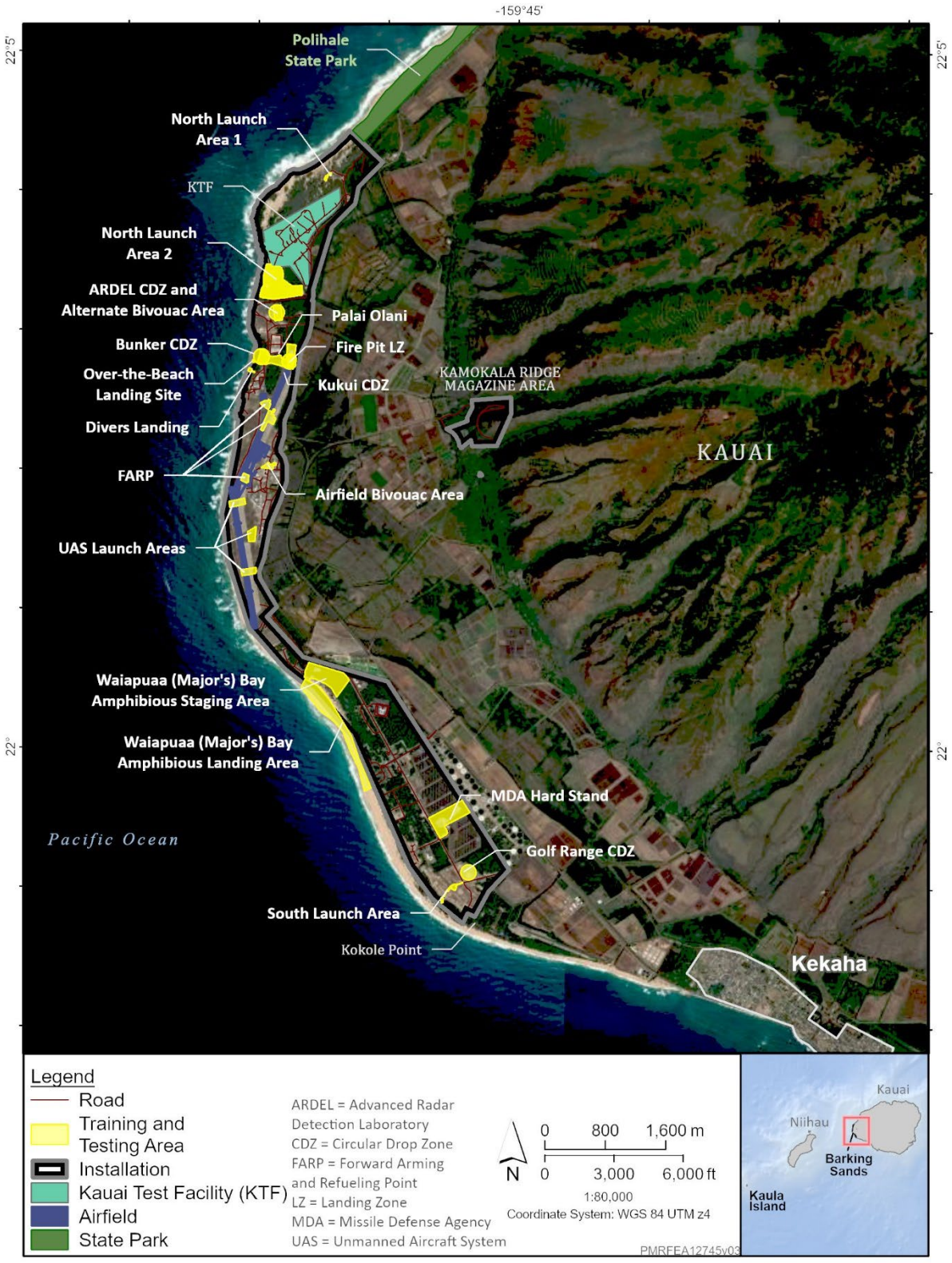


Figure 3.3-2: Location of PRMF Barking Sands and Nearest Off-Base Residential Area

Proposed increases in training and testing activities would not result in an appreciable increase in noise levels in the vicinity of human sensitive noise receptors or the general public. Therefore, noise impacts would be less than significant as a result of implementation of the Proposed Action.

3.3.6.2.2 Kaula Island

Under the Proposed Action, GUNEX and BOMBEX training utilizing aircraft would increase at Kaula Island. Inert munition impact, weapons firing, and aircraft noise would be the primary noise sources during these activities. However, there are no human sensitive noise receptors on the island, there would be no potential for degradation of the human noise environment. Therefore, noise impacts would be less than significant as a result of implementation of the Proposed Action.

3.4 Public Health and Safety

3.4.1 Definition of Resource

This discussion of public health and safety considers any ground activities, that have the potential to affect the safety, well-being, or health of military and civilian personnel or members of the public. Ground safety considers issues associated with activities that support training and testing, such as missile launching and firing artillery from Barking Sands shore locations.

3.4.2 Regulatory Setting

All U.S. government personnel and contractors working on PMRF are responsible for following applicable federal safety regulations and conducting activities in a manner that does not increase risk to workers or the public. U.S. Navy, Air Force, Army, and applicable Occupational Safety and Health Administration regulations and standards are used to implement safety and public health requirements for all workers on Hawaii's DoD installations.

PMRF takes every reasonable precaution during the planning and execution of range training and testing activities to prevent injury to human life or property. Training and testing activities under the Proposed Action would continue to be conducted in compliance with all applicable laws and regulations concerning the impact of toxic materials in the environment, including the requirements under the Resource Conservation and Recovery Act (RCRA) (42 U.S.C. Section 6921).

The PMRF Range Safety Office establishes and enforces safety restrictions related to potentially hazardous activities. PMRF procedures require a Range Safety Approval, reviewed by Range Safety and approved by the PMRF Commanding Officer, prior to commencing training and testing activities.

3.4.3 Region of Influence

The ROI for assessing potential impacts on public health and safety are the land-based training and testing areas within the PMRF Study Area (Figure 2.1-1). These include areas at Barking Sands (North Launch Area 1, North Launch Area 2, South Launch Area, Palai Olani, Waiapuaa Bay, MDA Hard Stand, Airfield Bivouac Area, Alternate Bivouac Area, FARP Areas, UAS Launch Area, Ground Maneuver Area) and Kaula Island. The population of concern primarily consists of DoD personnel and contractors directly involved with the Proposed Action, the local Kauai communities, and the public that access and use adjacent land and water areas for recreational and commercial purposes.

3.4.4 Affected Environment

3.4.4.1 Existing Conditions

The U.S. Navy's Range Sustainment Program is designed to ensure that the Navy's training and testing ranges remain operational while protecting human health and the environment for nearby communities. Crash/Fire and Rescue teams, which include nationally registered Emergency Medical staff, are located at the airfield Air Traffic Control Tower, to provide safety, emergency, and basic life support services for military, civil service, and non-government personnel at PMRF 24 hours a day, 7 days a week. Fire protection and firefighting services are provided by Crash/Fire and Rescue. Personnel are trained to respond with basic first aid and to activities in support of airfield operations, hazardous material incidents, confined space rescue, and hypergolic fuel releases, plus structural and brush fire fighting, fire prevention instruction, and fire inspections. More extensive emergency medical services are available from the West Kauai Medical Center in Waimea, 16 km (10 mi.) from the PMRF main gate.

3.4.4.1.1 Launch Hazards

PMRF conducts missile launches from land-based launching pads at Barking Sands. Potential hazards associated with missile launches include chemical contamination, non-ionizing radiation, lasers, and wildfire. All range users must (1) provide a list of project materials, items, or test conditions that could present hazards to personnel or material through toxicity, combustion, blast, acoustics, fragmentation, electromagnetic radiation, radioactivity, ionization, or other means; (2) describe radiation, toxic, explosive, or ionization problems that could accumulate as a result of their tests; (3) provide warhead information (if any), aerodynamic and flight control information, and system destruction information; (4) submit plans, specifications, and procedural or functional steps for operations involving explosives; and (5) provide complete operational specifications of any laser to be used and a detailed description of its planned use. To reduce the likelihood of launch-related wildfires, PMRF ensures that launch area flammable vegetation is maintained and therefore has 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.

Range Control is charged with surveillance, clearance, and real-time range safety, with the Range Control Officer solely responsible for determining range status and setting range firing conditions. The Range Safety Approval and the Range Safety Operation Plan documents are required for all weapons systems using PMRF. PMRF uses Range Commanders Council 321-23, Common Risk Criteria Standards for National Test Ranges,[2] a document which sets requirements for minimally acceptable risk criteria to personnel and facilities during range operations.

PMRF is responsible for establishing ground hazard areas and launch hazard areas (overwater areas) beyond which no potentially hazardous debris from an early flight termination is expected to fall. The hazard area is determined by size and flight characteristics of the missile, individual flight profile of each exercise or flight test, and reaction time between recognition of a flight malfunction and the decision to terminate flight. Any failure of the missile system that would cause potentially hazardous debris to fall outside the ground hazard area would be detected by the Missile Flight Safety Officer, who would terminate the missile flight before it could escape the hazard boundary. Data processed by ground-based or onboard missile computer systems may be used to recognize malfunctions and terminate

[2]https://www.trmc.osd.mil/wiki/spaces/publicRCC/pages/113019901/321+Common+Risk+Criteria+Test+Ranges?preview=%2F113019901%2F257167897%2F321-23_Common_Risk_Criteria_Test_Ranges.pdf

missile flight. The Safety Officer monitors the flight continuously and always retains the capability to terminate the flight, if necessary.

To ensure the protection of all persons and property, safety procedures have been established and implemented for airspace, sea space, and ground hazard areas. These standard operating procedures include establishing road control points, clearing the area using vehicles and helicopters (if necessary), and water pre-soaking areas adjacent to launch pads. The road control points are established three hours prior to launch to allow security forces to monitor traffic as it passes through the ground hazard area. At 20 minutes prior to launch, the area is determined to be clear of the public to ensure that, in the unlikely event of early flight termination, no injuries or damage to persons or property would occur. After the Range Safety Officer declares the area safe, the security force gives the all-clear signal, and the public is allowed to reenter the area. No inhabited structures are located within the off-base sections of the ground hazard area. To further minimize the potential for launch associated hazards, PMRF has a Missile Accident Emergency Team assembled for all launches and on-call status for PMRF launches.

Firing artillery from Barking Sands shore locations follows safety procedures and approvals similar to those described above for the missile launches.

3.4.4.1.2 Ordnance Transportation

Ordnance is delivered to Barking Sands via aircraft. All ordnance is transported in accordance with U.S. Department of Transportation regulations. Ordnance is stored in caves at the Kamokala Magazine area. Aircraft deliver ordnance to the on-base airfield. All ordnance is transported in accordance with the Department of Transportation regulations and PMRF procedures which cover the handling and transportation of ammunition, explosives, and hazardous materials on the facility.

PMRF's ordnance safety procedures minimize hazards and prevent exposure of personnel and property to unnecessary risks. The PMRF Range Control Branch (commonly referred to as "Range Safety") is responsible for (1) detailed analysis of all proposals concerning missiles or explosives and their proposed operation on the range; (2) establishing procedures for surveillance and control of traffic when inside and when entering hazard areas; (3) reviewing the design of facilities in which ordnance items are to be handled to ensure that safety protection meets DoD requirements; (4) training, certifying, and providing Launch Control Officers, Safety Monitors, and Ordnance personnel for operations involving explosive ordnance; (5) assuming responsibility for the control of all emergency facilities, equipment, and personnel required in the event of a hazardous situation from a missile inadvertently impacting on a land area; providing positive control of the ordering, receipt, issue, transport, and storage of all ordnance items; and ensuring that only properly certified handling personnel are employed in any handling of ordnance. When an approved procedure is not available for a range user's ordnance item, the safety specifications in a PMRF-prepared Explosive Safety Approval are followed.

Barking Sands has defined Explosive Safety Quantity Distance (ESQD) arcs. These arcs represent the prescribed minimum distance between sites storing explosive material and specified locations (e.g., inhabited buildings, public highways) to afford an acceptable degree of protection and safety. The size of the ESQD arc is proportional to the net explosive weight present. The arcs at PMRF are generated by the launch pads, the Kamokala Magazine ordnance storage area, the Interim Ordnance Handling Pad, and the Missile Assembly Building. The ESQD arcs are incorporated into ground hazard area calculations.

3.4.4.1.3 Aviation Ground Safety

Aviation-related ground activities on the PMRF airfield include aircraft ground refueling and UAS launch and recovery. They require PMRF Airfield Manager coordination and approval. These activities are conducted using published safety procedures.

3.4.4.1.4 Electromagnetic Radiation

Electromagnetic radiation (EMR) zones around transmitter sites and tracking radars are designated at various locations on Barking Sands. High-density electromagnetic power may constitute a hazard to personnel (Hazards of Electromagnetic Radiation to Personnel [HERP]), explosives (Hazards of Electromagnetic Radiation to Ordnance [HERO]), or fuels (Hazards of Electromagnetic Radiation to Fuels [HERF]) or may interfere with nonmilitary electronic equipment. As directed by Navy procedures, PMRF uses a combination of establishing safety zones and conducting sector blanking (no radiation) in occupied areas to avoid potential EMR exposure. To ensure exposure risks to personnel are minimal, the Navy conducts regular radiation hazard surveys every five years and before any modifications to a unit are made or when new radar equipment is installed. In addition, all radar units have red (radar unit is on) and blue (radar unit is emitting EMR) warning lights. EMR generated from radar units at Barking Sands do not expose the public to any hazardous radiation. Potential impacts on biological species from EMR are discussed in Section 3.5 (Terrestrial Biological Resources).

3.4.4.1.5 Aircraft Ordnance Delivery

Aerial inert bombing and gunnery occur on the southern tip of the Kaula Island; no other hazardous operations occur on the island. To minimize health and safety risks and to ensure an adequate margin of safety to both personnel and equipment during the conduct of inert bombing and gunnery training operations by the military, a Danger Zone surrounding Kaula Island was established in which no person, vessel, or other craft shall enter or remain in the areas within a circular area with a radius of 4.8 kilometers (3 mi.) centered on the island at any time except as authorized by the enforcing agency (33 CFR 334.1340).

The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. The proposed revision would open the waters within a 3 NM radius of the island (latitude 21°39'30", longitude 160°32'30"), with restrictions only during active training activities. This area is closed to persons, vessels, or other craft during training events only after a Local Notice to Mariners (LNM) is published on the U.S. Coast Guard website[3] for five continuous days prior to a training event. Additionally, a Notice to Airmen (NOTAM) is issued by the Federal Aviation Administration[4] to close the airspace surrounding Kaula Island. The durations of closures vary and are dependent on the activity being conducted. Under the proposed revision, the area would re-open upon the expiration of the LNM (33 CFR 334.1340). The Navy is exploring how the public would be notified if the danger zone were to be accessible for recreational activities outside of training event closures.

Live ordnance was used at Kaula Island until 1981, at the latest; as such, UXO may be present on or just below the surface of Kaula Island and the adjacent waters from possible misfires of live ordnance prior to 1978. Therefore, the island and tidal shoreline are closed to unauthorized personnel at all times. Furthermore, military personnel conduct a flyover of the island prior to any release of inert ordnance in

[3] https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/
[4] https://notams.aim.faa.gov/notamSearch/nsapp.html#/

order to ensure the area is clear of people and hauled out monk seals, and to determine if it is safe to conduct the training mission.

Munitions constituents are the chemical compounds and metals that can be released from military munitions and other related materials; those associated with GUNEX and BOMBEX activities at Kaula Island under the Proposed Action are included in Appendix A (Military Readiness Activity Descriptions). All records of inert ordnance expenditures from GUNEX and BOMBEX activities at Kaula Island are captured, recorded, and tracked by the Navy. The Navy has required reporting of any misfire of ordnance at Kaula Island since 1978 (U.S. Department of the Navy, 1978). A thorough review of Navy records indicates no reported instances of weapon misfires into the ocean from 1978 (the year reporting requirements were established) to the present. While some fishermen have reported seeing ordnance in waters around Kaula Island in the past, such remnants are likely pre-dating historical data and current policies since early 2000s. Regular range clearance operations are not conducted on the range because physical access is limited due to difficult terrain and sea states around the island. Kaula Island is densely populated with several bird species year-round making it extremely hazardous for helicopter access. Due to the extremely limited access, periodic usage, and use of only non-explosive munitions, operational range clearance is not presently conducted at Kaula Island. Additionally, under the USEPA's Military Munitions Rule, which serves as an extension of RCRA that specifically addresses the unique circumstances related to military munitions, munitions employed for their intended purpose in training are not considered solid waste.

Barking Sands and Kaula Island are evaluated as part of the PMRF Range Condition Assessment (RCA) under the Navy's Range Sustainment Environmental Program Assessment. The 2019 RCA for PMRF indicates that, at Barking Sands, human receptors are limited to range users and level of risk is acceptable for all range users. At Kaula Island, no further analysis was determined to be required to assess risk of off-range (outside of the 11-acre inert ordnance impact area) release of munitions constituents due to the small quantities of inert munitions used on an annual basis and the low probability of exposure to human receptors. Additionally, the established misfire reporting process has not identified any misfires into the ocean in the past 47 years. As such, it was determined that there are no munitions constituents of concern migrating off-range at either Barking Sands or Kaula Island.

3.4.5 Environmental Consequences

Impacts from the Proposed Action are assessed according to the potential to increase or decrease safety risks to personnel, the public, property, or the environment. The analysis considers the types of activities, introduction of new health or safety risks, locations of hazardous operations and activities with respect to human sensitive noise receptors and the general public, and adequacy of safety-related planning and procedures in place. An adverse impact could occur if there was a significant increase in health and safety risks to military and civilian personnel on PMRF or the public due to project-related training and testing activities.

The Proposed Action includes the continuation of appropriate and relevant SOPs that avoid and minimize potential impacts on public health and safety. Relevant SOPs are listed in Table 3.4-1.

Table 3.4-1: List of Standard Operating Procedures for Public Health and Safety

Protection Focus	Requirements
Navy Safety Policy	The Navy Safety and Occupational Health Manual, OPNAV M-5100.23.
Public Safety	Operating restrictions and requirements defined for the use of Kaula Island for training per FACSFAC Pearl Harbor Operating Area and Range Manual (FACSFAC PH 3120.4).
PMRF Range Safety Policy	Defines the acceptable risk levels and basic range safety policy to be followed when conducting range operations at PMRF, per PMRF Instruction 8020.16A.
EMR Zone to Personnel	Restrict personnel from entering EMR hazard areas.
EMR Zone to Fuel	Restrict fuel operations to locations outside EMR hazard areas.
EMR Zone to Ordnance and Munitions	Restrict ordnance/munitions operations/storage to locations outside EMR hazard areas.
EMR Safety Survey	The Navy conducts regular radiation hazard surveys every five years and before any modifications to a unit are made or when new radar equipment is installed.
Explosive Hazards	Conduct ordnance/munitions operations such as storage, transportation, and launching/firing in accordance with DoD safety directives and range regulations per DoD Defense Explosives Safety Regulation 6055.09
Public Safety	A minimum of five business days prior to a training event at Kaula Island, a Local Notice to Mariners (LNM) is published on the U.S. Coast Guard website (https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/) to close the surrounding sea space. Additionally, a Notice to Airmen (NOTAM) is issued by the Federal Aviation Administration (https://notams.aim.faa.gov/notamSearch/nsapp.html#/) to close the airspace surrounding Kaula Island. The durations of closures vary and are dependent on the activity being conducted.
Public Safety	Navy personnel are required to verify that the range is clear of non-participants before initiating any potentially hazardous activity.

Notes: DoD = Department of Defense, EMR = Electromagnetic Radiation, FACSFAC = Fleet Area Control and Surveillance Facility, OPNAV M = Chief of Naval Operations Manual

3.4.5.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation listed in Table 1.6-1. Proposed increases in land-based training and testing would not occur, and there would be no change in designated training and testing areas. Public health and safety risk would not change. At present there is low risk to public health and safety. PMRF has not experienced a reportable major, work-related, ground incident in over ten years. Given the historical data related to limited incidents creating low probability of elevated risk to public health and safety, no significant impacts on public health and safety would occur as a result of implementation of the No Action Alternative.

3.4.5.2 Proposed Action

3.4.5.2.1 Barking Sands

Potential public health and safety hazards on Barking Sands consists of EMR associated with radars and explosive safety associated with launch and firing activities. Under the Proposed Action, there would be no changes in the type of land-based training and testing activities that currently occur at Barking Sands;

however, the continuation of these activities would occur at increased numbers depending on the activity type. PMRF takes every reasonable precaution during planning and execution of training and testing activities to prevent injury to human life or property. The 2019 RCA for PMRF concluded that the range and training operations at Barking Sands are in compliance with environmental laws and policies, and there are no munitions constituents of concern migrating off the range[5].

Under the Proposed Action, standard operating procedures listed in Table 3.4-1 would continue to be implemented. The same methodology to schedule events and de-conflict activities would occur. Although the number of activities may increase, each would still receive the same amount of attention and fall under the same SOPs as current activities—regardless of the service conducting the training or testing. Based on the adherence to established procedures, increasing activity would not increase risk to public health and safety. Proposed increases in activities would not pose any increased risks to military personnel or the general public. Therefore, public health and safety impacts at Barking Sands would be less than significant as a result of implementation of the Proposed Action.

3.4.5.2.2 Kaula Island

Public access to Kaula Island has been and is currently restricted at all times due to dangerous and unsteady terrain and the possibility of UXO existing on the island. As such, operational range clearance is not presently conducted at Kaula Island. The 2019 RCA concluded that the range and training operations at Kaula Island are in compliance with environmental laws and policies, and there are no military munitions constituents of concern migrating off the range.

To minimize health and safety risks, a Danger Zone surrounding Kaula Island was established for the primary purpose of ensuring an adequate margin of safety to both personnel and equipment during inert bombing and gunnery training operations by the military. The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. The proposed revision would open the waters within a 3 NM radius of the island, with restrictions only during active training activities. This area is closed to persons, vessels, or other craft during training events only after a LNM is published on the U.S. Coast Guard website[6] for five continuous days prior to a training event. Additionally, a NOTAM is issued by the Federal Aviation Administration[7] to close the airspace surrounding Kaula Island. The durations of closures vary and are dependent on the activity being conducted. Under the proposed revision, the area would re-open upon expiration of the LNM. The Navy is exploring how the public would be notified if the danger zone were to be accessible for recreational activities outside of training event closures.

Under the Proposed Action, current standard operating procedures would continue, resulting in less than significant public health and safety impacts. A minimum of five business days prior to a training event at Kaula Island, a LNM is published on the U.S. Coast Guard website to close the surrounding sea space. Additionally, a NOTAM is issued by the Federal Aviation Administration to close the airspace surrounding Kaula Island. Furthermore, prior to firing by any aircraft, overflight pre-surveys are conducted to determine if any vessels are in the water surrounding Kaula Island. Presence of a vessel in the vicinity prohibits ordnance delivery until the area is clear.

[5] "Range" is meant as the 11-acre inert-ordnance impact area on the southern tip of Kaula Island.
[6] https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/
[7] https://notams.aim.faa.gov/notamSearch/nsapp.html#/

Under the Proposed Action, standard operating procedures as listed in Table 3.4-1 would continue to be implemented; therefore, public health and safety impacts at Kaula Island would be less than significant as a result of implementation of the Proposed Action.

3.5 Terrestrial Biological Resources

3.5.1 Definition of Resource

Biological resources include living, native, or naturalized plant and animal species and the habitats within which they occur. Plant associations are referred to generally as vegetation, and animal species are referred to generally as wildlife. Habitat can be defined as the resources and conditions present in an area that support a plant or animal. For the purposes of this EA, biological resources are divided into vegetation, wildlife, and special-status species.

3.5.2 Regulatory Setting

For purposes of this EA, *special-status species* are those species listed as threatened or endangered under the ESA, associated critical habitat for ESA-listed species, and species protected under the Marine Mammal Protection Act (MMPA) and the MBTA. Special-status species also include those species addressed by State of Hawaii rules protecting threatened and endangered species. The federal regulatory frameworks relevant to biological resources analyzed in this EA are summarized below.

3.5.2.1 Endangered Species Act

The purpose of the ESA is to conserve the ecosystems upon which threatened and endangered species depend and to conserve and recover listed species. Section 7 of the ESA requires action proponents to consult with the USFWS to ensure that their actions are not likely to jeopardize the continued existence of ESA-listed threatened and endangered species or result in the destruction or adverse modification of designated critical habitat. Critical habitat is generally not designated on any areas under federal jurisdiction, controlled, or designated for use by the DoD where an Integrated Natural Resources Management Plan has been developed that, as determined by the Secretaries of the Interior or Commerce, provides a benefit to the species subject to critical habitat designation.

Informal consultation under section 7 of the ESA was conducted with USFWS to address potential impacts on ESA-listed terrestrial species. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, or the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island.

3.5.2.2 Migratory Bird Treaty Act

Over 1,000 species of birds are protected in the United States under the MBTA of 1918 (16 U.S.C. sections 703–712; Ch. 128, July 13, 1918, 40 Stat. 755, as amended). The list of migratory bird species protected under MBTA includes any species that is native to the United States or U.S. territories, and is included in the four international treaties. A native migratory bird species is one that is present as a result of natural biological or ecological processes. A full list of species protected by the MBTA can be found under 50 CFR section 10.13. Migratory and most native-resident bird species are protected under the MBTA, and their conservation by federal agencies is mandated by EO 13186 (*Responsibilities of Federal Agencies to Protect Migratory Birds*). Under the MBTA, it is illegal for anyone by any means or in any manner, to take, possess, import, export, transport, sell, purchase, barter, or offer for sale,

purchase, or barter, any migratory bird, or the parts, nests or eggs of such a bird at any time, except under the terms of a valid permit issued pursuant to federal regulations.

The 2003 National Defense Authorization Act gave the Secretary of the Interior authority to prescribe regulations to exempt the Armed Forces from the incidental taking of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the armed forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use. Military readiness activities do not include (1) routine operation of installation support functions such as administrative offices, military exchanges, water treatment facilities, schools, housing, storage facilities, and morale, welfare, and recreation activities; (2) the operation of industrial activities; or (3) the construction or demolition of facilities listed in (1) or (2) (50 CFR section 21.6). The proposed training and testing assessed in this EA fall within the definition of military readiness activities.

In 2007, the final rule, known as the DoD Migratory Bird Rule (50 CFR part 21), authorized the DoD to incidentally take migratory birds in such cases and includes a requirement that if the DoD determines that a proposed or an ongoing military readiness activity might result in a significant adverse effect on a population of a migratory bird species, DoD must confer and cooperate with the USFWS to develop appropriate and reasonable conservation measures to minimize or mitigate identified significant adverse effects. The analysis to determine if a significant adverse effect on a population would occur is done in accordance with, and through, the NEPA process (i.e., this EA).

3.5.2.3 Marine Mammal Protection Act

All marine mammals are protected under the provisions of the MMPA (16 U.S.C. section 1361 et seq.). The MMPA prohibits any person or vessel from "taking" marine mammals in the United States or the high seas without authorization. The MMPA defines "take" to mean "to harass, hunt, capture, or kill or attempt to harass, hunt, capture, or kill any marine mammal." National Defense Authorization Act of fiscal year 2004 (Public Law 108-136) amended the definition of harassment as it applies to military readiness activities or scientific research activities conducted by or on behalf of the federal government, consistent with Section 104(c)(3) [16 U.S.C. 1374(c)(3). In the fiscal year 2004 National Defense Authorization Act, military readiness activities were defined as "all training and operations of the Armed Forces that relate to combat" and "the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use." For military readiness activities, Level B harassment is defined as any act that disturbs or is likely to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behaviors to a point where such behaviors are abandoned or significantly altered (16 U.S.C. 1362 (18)(B)(i) and (ii)). Section 101(a)(5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals if certain findings are made and regulations are issued.

3.5.3 Region of Influence

The ROI is comprised of two main areas (Figure 2.1-1):

- Barking Sands (North Launch Area 1, North Launch Area 2, South Launch Area, Palai Olani Area, Waiapuaa Bay Amphibious Staging Area, MDA Hard Stand, Airfield Bivouac Area, Alternate Bivouac Area, FARP Areas, UAS Launch Area, and Ground Maneuver Areas) (Figure 2.1-2 through Figure 2.1-11)
- Kaula Island (Figure 2.1-12)

3.5.4 Affected Environment

3.5.4.1 Existing Conditions

3.5.4.1.1 Vegetation

Barking Sands

There are six vegetation types found across the Barking Sands areas: kiawe (*Prosopis pallida*)-koa haole (*Leucaena leucocephala*) scrub, aalii (*Dodonaea viscosa*)-nama (*Nama sandwicensis*) scrub, pohinahina (*Vitex rotundifolia*)-naupaka (*Scaevola sericea*) dune, landscaped, agave, and ruderal vegetation (Table 3.5-1). Kiawe-koa haole scrub with *Agave* and kiawe-koa haole scrub with algaroba are depicted in the figures, but for the purposes of this analysis they are combined generally as kiawe-koa haole scrub. *Agave*, kiawe-koa haole scrub, landscaped, and ruderal vegetation are all non-native. Native aalii-nama scrub is common throughout undeveloped portions of Barking Sands. Pohinahina-naupaka dune vegetation is found along the dunes on the coast of Barking Sands. Sites that contain native vegetation are depicted in Figure 3.5-1 through Figure 3.5-10. The Waiapuaa Bay Amphibious Areas depicts algaroba (long-thorn kiawe) (Figure 3.5-5); however, since the vegetation type is not native and comprises only 0.02 acre, it is not significant and therefore not discussed further in this document.

Table 3.5-1: Vegetation Types at Barking Sands by Proposed Training and Testing Area

Proposed Training and Testing Area	Vegetation Type (acres)					
	Non-Native				Native	
	Landscaped	Ruderal	Kiawe-Koa Haole Scrub*	Agave	Aalii-Nama Scrub	Pohinahina-Naupaka Dune
North Launch Area 1	3.8	---	---	---	---	---
North Launch Area 2	34.9	---	3.1	---	---	0.02
South Launch Area	9.9	---	0.1	---	---	---
Palai Olani	17.3	---	6.0	---	0.4	0.02
Waiapuaa Bay Amphibious Areas	1.4	2.3	26.2	0.4		0.1
MDA Hard Stand	12.9	---	10.3	---	4.1	---
Alternate Bivouac Area	7.8	---	0.3	---	---	---
Airfield Bivouac Area	2.2	---	---	---	---	---
FARP Areas	10.1	---	---	---	---	---
UAS System Launch Area	11.8	---	---	---	---	---
Ground Maneuver Area†	---	---	---	---	---	---
Total	**96.4**	**2.3**	**58.2**	**0.4**	**8.3**	**0.14**

*Includes kiawe-koa haole scrub with *Agave* and kiawe-koa haole scrub with algaroba.
†The ground maneuver areas are currently paved or gravel roads/trails.
Notes: FARP = Forward Arming and Refueling Point, MDA = Missile Defense Agency, UAS = Uncrewed Aircraft System

Kaula Island

Due to the strong, dry, winds on Kaula Island, vegetation on the island is sparse (Figure 3.5-11). The dominant vegetation type in the island is semi-arid and strand plants of low-growing shrubs and herbaceous plants (Figure 2.1-12) (Naval Facilities Engineering Systems Command Hawaii, 2023). One ESA-listed plant species, *Portulaca villosa*, has been recorded on Kaula Island, as discussed in Section 3.5.4.1.3 (Special-Status Species).

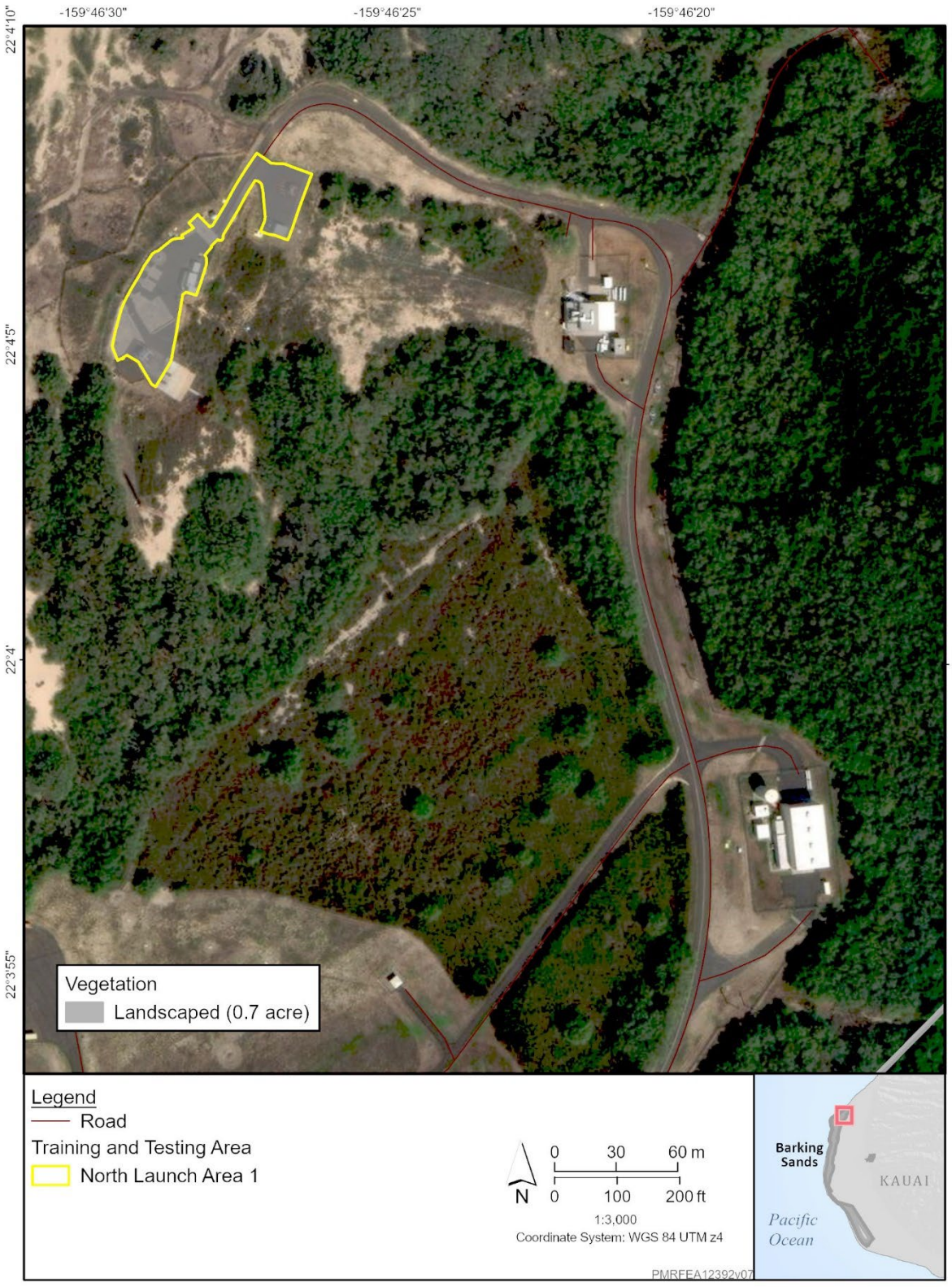


Figure 3.5-1: Vegetation Types Within North Launch Area 1



Figure 3.5-2: Vegetation Types Within North Launch Area 2

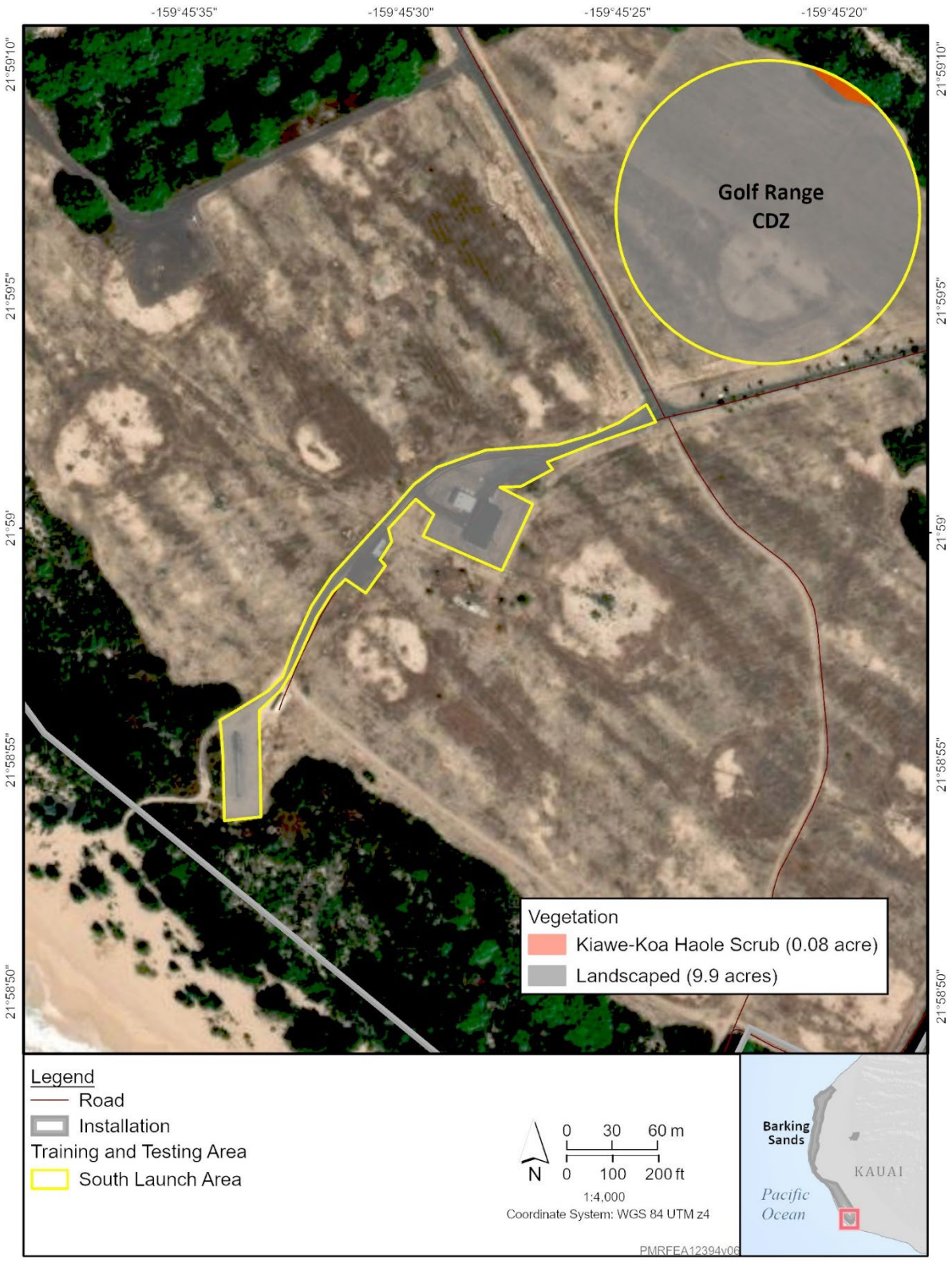


Figure 3.5-3: Vegetation Types Within the South Launch Area

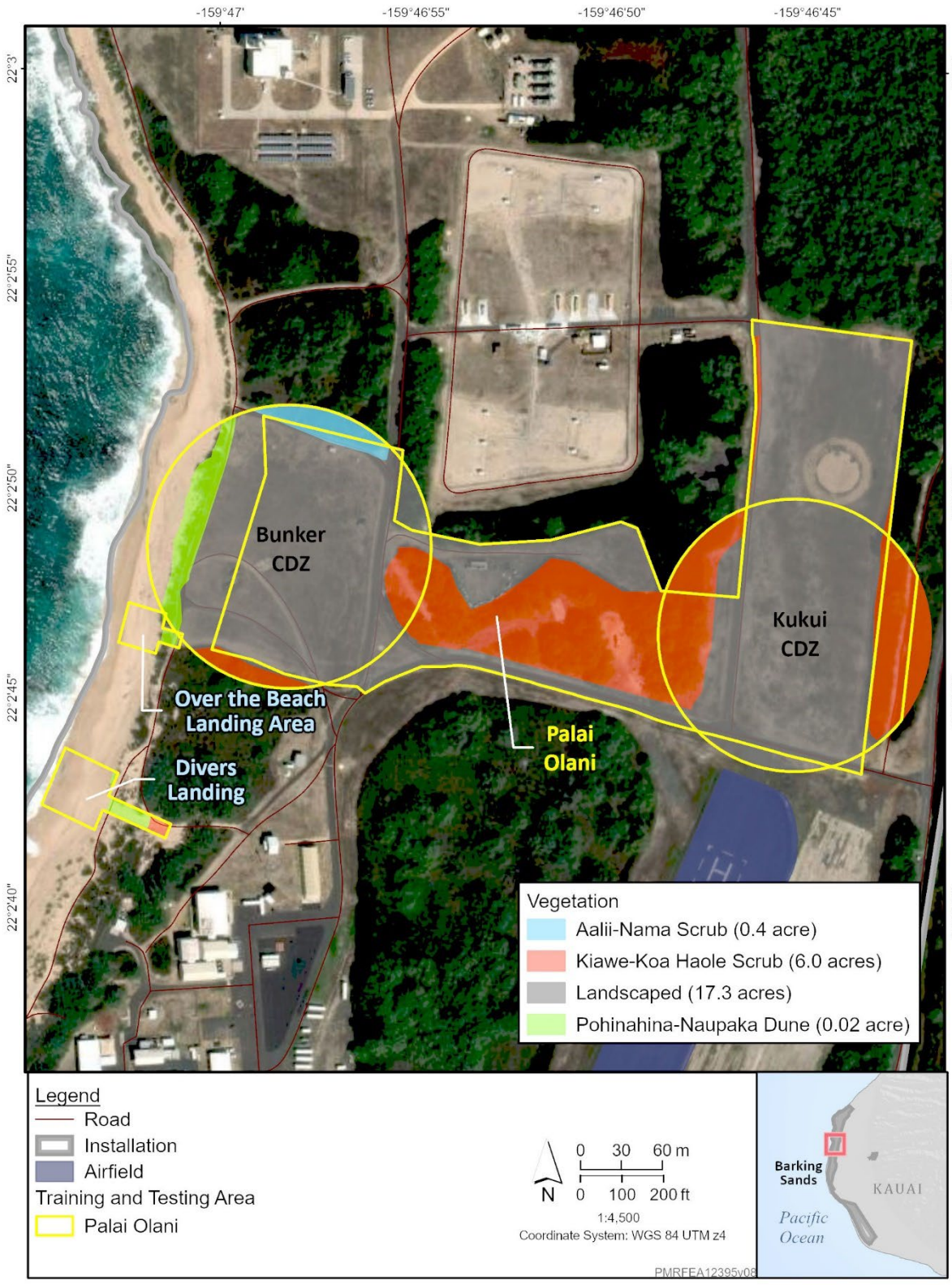


Figure 3.5-4: Vegetation Types Within the Palai Olani Area



Figure 3.5-5: Vegetation Types Within the Waiapuaa Bay Amphibious Landing and Staging Areas

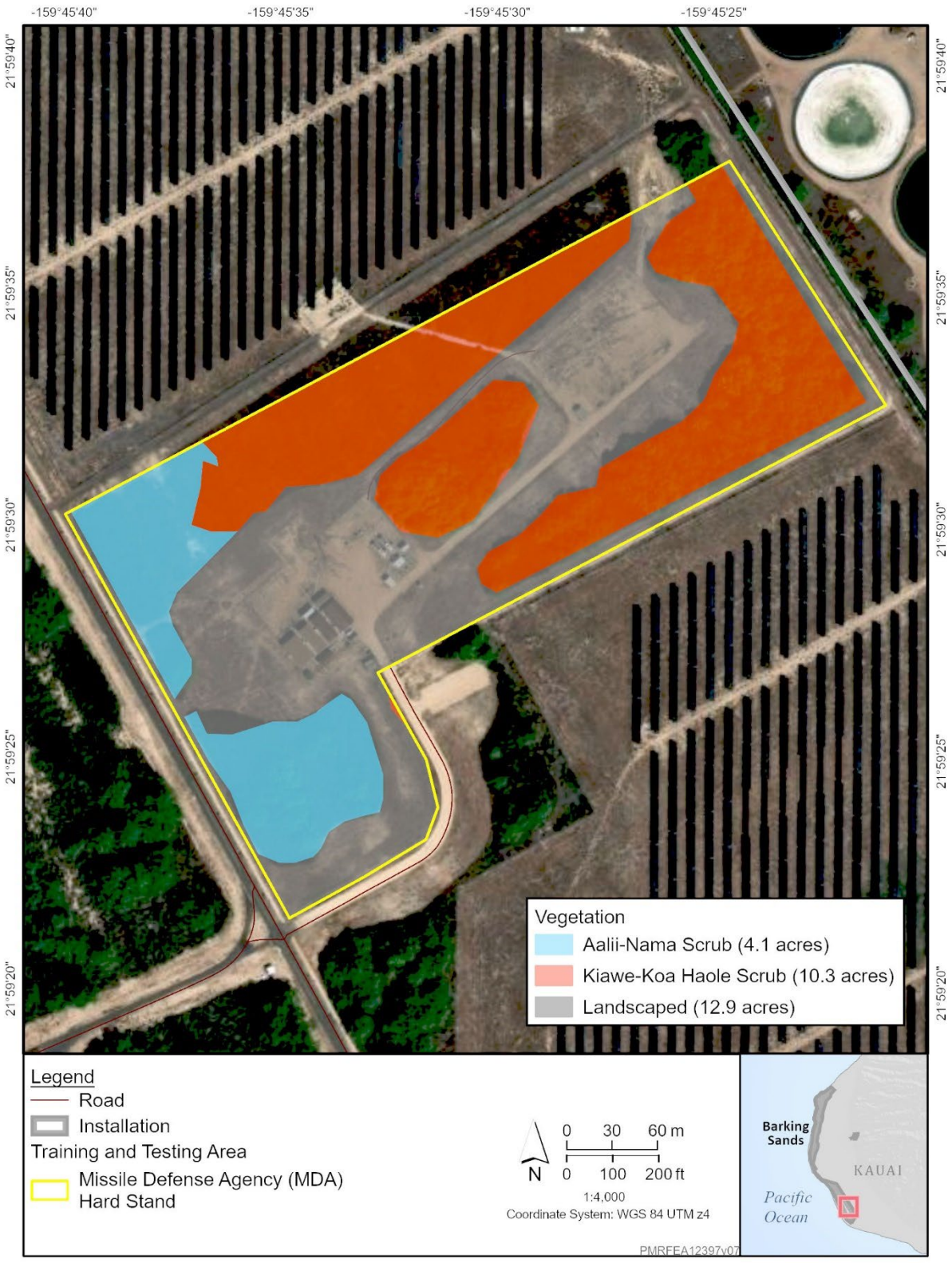


Figure 3.5-6: Vegetation Types Within the MDA Hard Stand Area

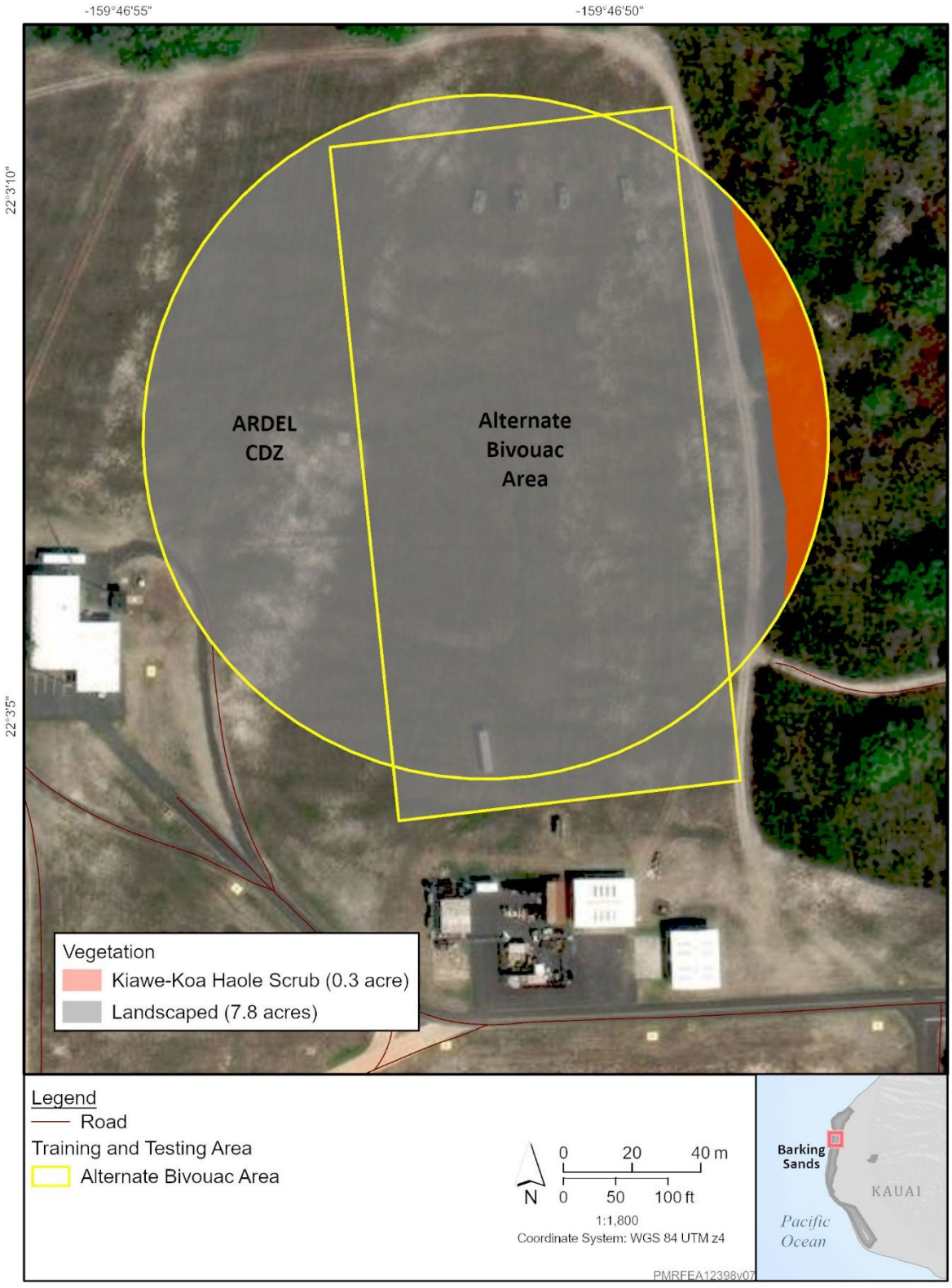


Figure 3.5-7: Vegetation Types Within the Alternate Bivouac Area



Figure 3.5-8: Vegetation Types Within the Airfield Bivouac Area



Figure 3.5-9: Vegetation Types Within the FARP Areas



Figure 3.5-10: Vegetation Types Within the UAS Launch System Area



Figure 3.5-11: Topography and Vegetation Cover of Kaula Island

3.5.4.1.2 Wildlife

Barking Sands

A total of 76 species of birds have been documented at Barking Sands, of which 46 are native and 30 are non-native (Naval Facilities Engineering Systems Command Hawaii, 2023). The most widespread bird species observed throughout PMRF are the non-native Japanese white-eye (*Zosterops japonicus*) and non-native house finch (*Carpodacus mexicanus*). The Laysan albatross (*Phoebastria immutabilis*) is a breeding visitor that is commonly observed during nesting season (November to December) from Kinikini ditch to the north end of the base. The wedge-tailed shearwater (*Puffinus pacificus*) is also a breeding visitor that has three main active nesting colonies on Barking Sands: Nohili Dunes, Kinikini Ditch, and the Beach Cottages area. Additionally, wedge-tailed shearwaters are also found nesting throughout Barking Sands coastline in low densities (Naval Facilities Engineering Command Pacific, 2022) (Figure 3.5-12 and Figure 3.5-13). Eight species of birds are ESA listed and are described in detail in Section 3.5.4.1.3 (Special-Status Species).

Sixteen terrestrial mammal species have been documented at Barking Sands. The introduced feral cat (*Felis catus*) is the most common and widespread mammal. Other widespread invasive mammals include the Columbian black-tailed deer (*Odocoileus hemionus*), feral pig (*Sus scrofa*), feral goat (*Capra hircus*), and black or roof rat (*Rattus rattus*). The Hawaiian hoary bat (*Lasiurus cinerus semotus*) is the only native terrestrial mammal in Hawaii and is discussed in detail in Section 3.5.4.1.3 (Special-Status Species). Hawaiian monk seals are commonly observed along the beaches of PMRF Barking Sands and are discussed in detail in Section 3.5.4.1.3 (Special-Status Species).

Several reptile and amphibian species have been documented, most of which are non-native terrestrial lizards and toads. The ESA-listed green sea turtle (*Chelonia mydas*) utilizes the beaches of Barking Sands for nesting and the nearshore waters for foraging and is discussed in detail in Section 3.5.4.1.3 (Special-Status Species) (Figure 3.5-12, Figure 3.5-13, and Figure 3.5-14).

Kaula Island

While under federal jurisdiction since 1924, the Navy began utilizing Kaula Island for ordnance training in 1952.[8] Kaula Island's southern 1,000 feet (approximately 8 percent of the island) is designated for inert bombing and gunnery training; however, the remainder of the 108-acre island remains unused for military training exercises (Figure 2.1-12) (Naval Facilities Engineering Systems Command Hawaii, 2023). Few ground-based surveys have been conducted at Kaula Island due to the terrain and potential UXO on the island. The most recent ground survey is the 1998 Kaula Rock Survey Trip Report (Hawaii Department of Land and Natural Resources, 1998). Four boat-based surveys were conducted at Kaula Island between 2009 and 2012. The results of the land and boat-based surveys conducted at Kaula Island are found in Table E-13 in Appendix E (Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023). As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual aerial avian and marine mammal surveys have been conducted at Kaula Island since 2009. The resulting high-resolution images have identified seabird species that include sooty tern (*Onychoprion fuscatus*), grey-backed tern (*Onychprion lunatus*), Laysan albatross, great frigatebird (*Fregata minor*), brown noddy (*Anous stolidus*), red-footed booby (*Sula sula*), masked booby (*Sula dactylatra*), red-tailed tropicbird (*Phaethon rubricauda*), and wedge-tailed shearwater (Normandeau Associates Inc & Air Data Solutions, 2023; Normandeau Associates Inc. & APEM Ltd. Joint Venture, 2021). An aerial survey conducted in August 2023 identified 17,638 individuals of these nine species on the island (Normandeau Associates Inc & Air Data Solutions, 2023). The reports for the aerial surveys conducted at Kaula Island have been made available at the Navy's Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/reporting/pacific/). Additionally, summaries of the aerial surveys are included in Appendix E (Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023.).

Only non-native rat and mice species have been documented on Kaula Island; no Hawaiian hoary bats have been recorded. The ESA-listed Hawaiian monk seal hauls out on the rocky ledges along the high-water line of Kaula Island and is discussed below in Section 3.5.4.1.3 (Special-Status Species) (Naval Facilities Engineering Command Pacific, 2022).

A 1998 survey of Kaula Island found the non-native snake-eyed skink (*Cryptoblepharus poecilopleurus*) to be common throughout the island (Hawaii Department of Land and Natural Resources, 1998). Since surveys began in 1932, no other native or non-native reptile or amphibian species have been observed on Kaula Island. Sea turtles have also not been observed, and no suitable nesting or basking habitat is present (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022).

[8] Kaula Island was used by the U.S. Air Force during the 1940s.

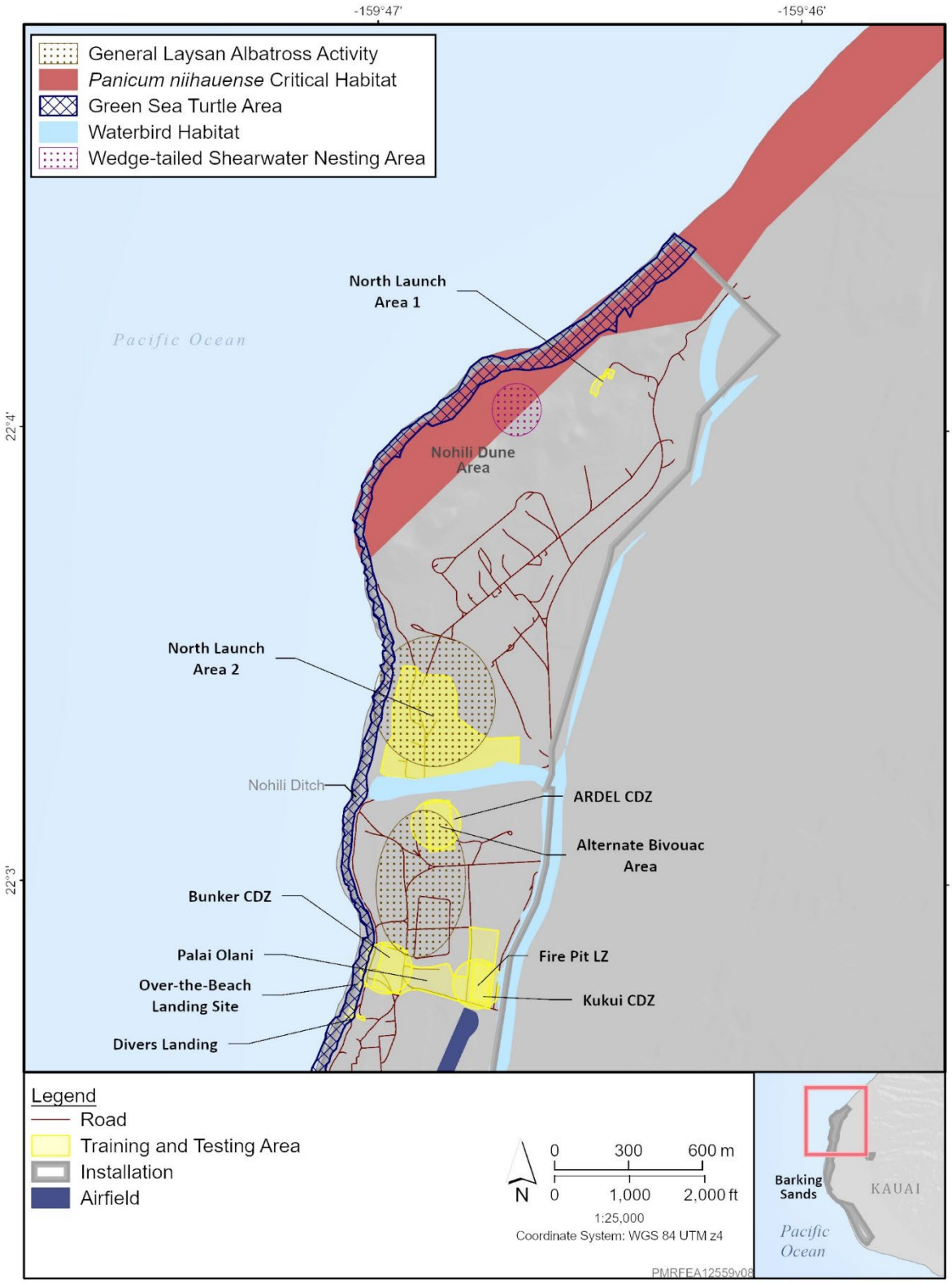


Figure 3.5-12: *Panicum niihauense* Critical Habitat, Green Sea Turtle Habitat, and Waterbird Habitat at North PMRF

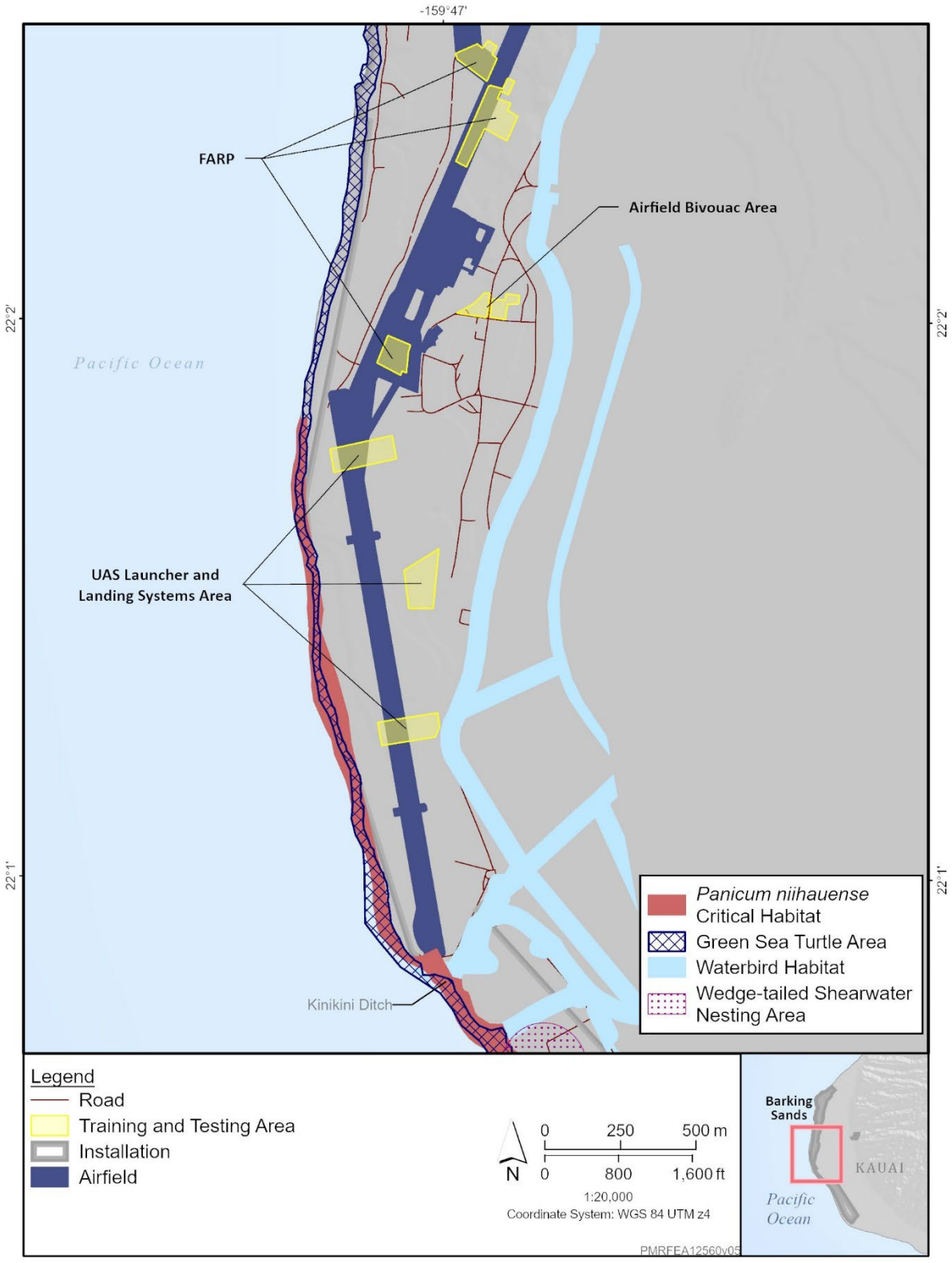


Figure 3.5-13: *Panicum niihauense* Critical Habitat, Green Sea Turtle Habitat, and Waterbird Habitat at Central PMRF

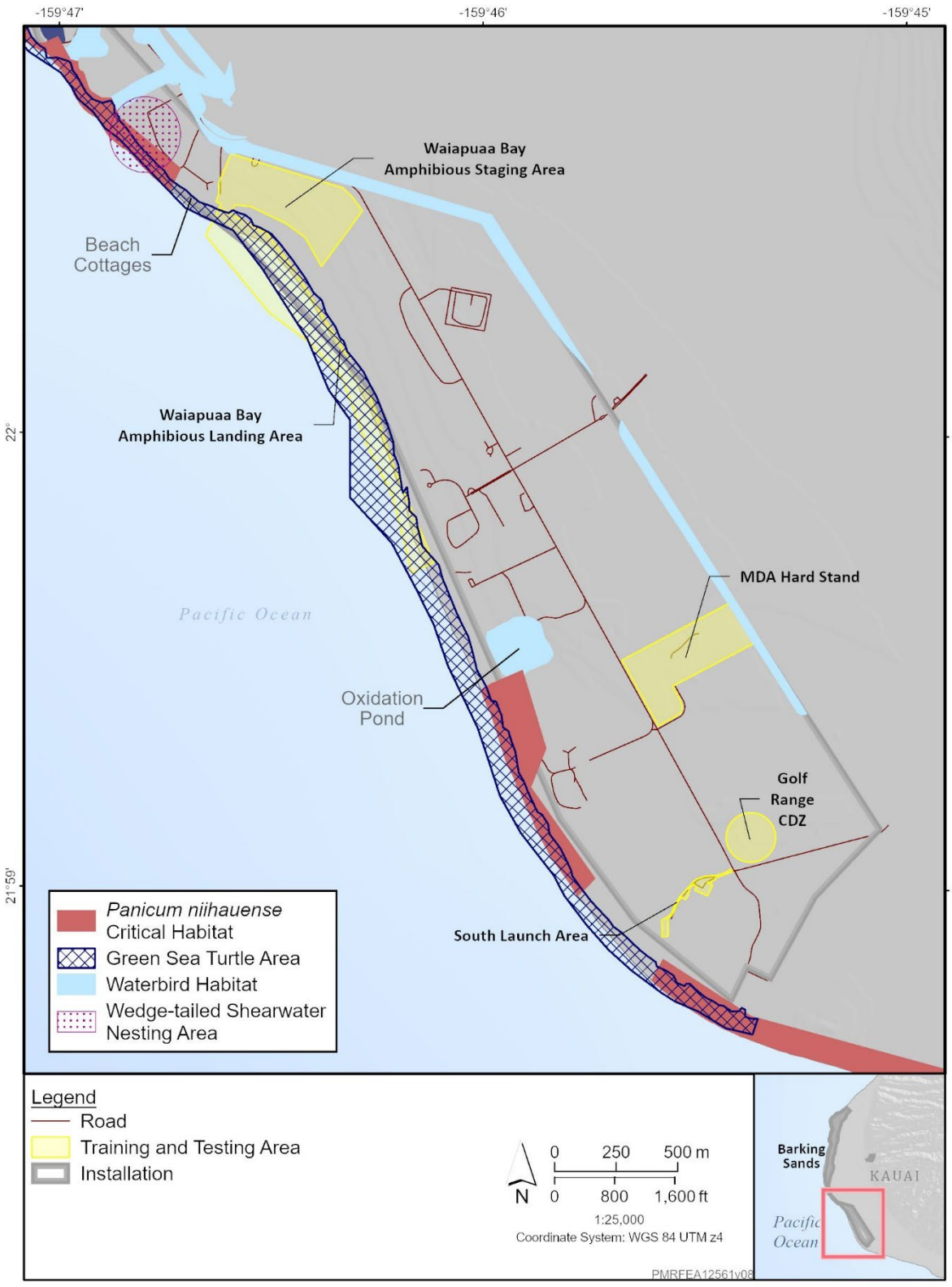


Figure 3.5-14: *Panicum niihauense* Critical Habitat, Green Sea Turtle Habitat, and Waterbird Habitat at South PMRF

3.5.4.1.3 Special-Status Species

Barking Sands

A total of 11 ESA-listed species are known to occur or potentially occur within the areas that would be used under the Proposed Action: one reptile, eight birds, and two mammals (Table 3.5-2). ESA-listed plant species are not included as they have not been documented within the ROI and would therefore not be subject to impacts with implementation of the Proposed Action (Naval Facilities Engineering Systems Command Hawaii, 2023). However, critical habitat for the ESA-listed plant *Panicum niihauense* occurs on PMRF and is discussed below (Naval Facilities Engineering Systems Command Hawaii, 2023). Only species documented within the two ROI areas are discussed below.

Hawaiian Hoary Bat (*Lasiurus cinerus semotus*). The Hawaiian hoary bat is ESA-listed as endangered and is the only native terrestrial mammal in the State of Hawaii. Due to their cryptic and solitary nature, knowledge of Hawaiian hoary bat ecology is limited. They occur on all the main Hawaiian Islands and utilize habitat from sea level to at least 3,600 meters above sea level (U.S. Department of the Navy, 2021). The bat may be present at PMRF Barking Sands year-round but is most commonly found in the winter (Naval Facilities Engineering Command Pacific, 2022). The Hawaiian hoary bat may utilize suitable habitat on Barking Sands for foraging, breeding, and roosting. Hawaiian hoary bats roost primarily in trees 15 feet or taller. Breeding season occurs from June 1 to September 15. The greatest known threats to the bat include habitat loss and mortality from barbed wire fences (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022).

Hawaiian Monk Seal (*Neomonachus schauinslandi*). Hawaiian monk seals are ESA-listed as endangered and can be found hauled out on the beaches of Barking Sands. Population estimates for the seals is around 1,600 individuals throughout the Hawaiian Islands (National Marine Fisheries Service, 2024). Breeding and pupping for monk seals occurs year-round, peaking between the months of April and August. At Barking Sands, common resting beaches include Nohili Ditch (Figure 3.5-12) and Kinikini Ditch (Figure 3.5-13). Seals have also been observed hauled out at Waiapuaa Bay, Kokole Point (by the South Launch Area), and at the north end of the base in the Nohili Dunes area (north of Nohili Ditch) (Figure 3.5-12 and Figure 3.5-14) (Naval Facilities Engineering Systems Command Hawaii, 2023).

Green Sea Turtle (*Chelonia mydas*). The green sea turtle is ESA-listed as endangered and regularly utilizes Barking Sands beaches and nearshore waters for nesting, basking, and foraging (Figure 3.5-12 through Figure 3.5-14) (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022). Green sea turtle sightings at Barking Sands are relatively common, and they are seen hauled out near the shoreline at the Nohili Ditch outfall, Divers Landing (Figure 3.5-12), and in front of Shenanigan's Restaurant (Naval Facilities Engineering Command Pacific, 2022). Between 2015 and 2023, a total of 12 green sea turtle nests were documented on PMRF (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022).

Table 3.5-2: Known and Potential Occurrence of ESA-Listed Species Within the ROI at PMRF

Scientific Name	Common Name	ESA Status	Presence	
			Barking Sands	Kaula Island
Plants				
Panicum niihauense (critical habitat)	Lauehu	E	No	No
Portulaca villosa	Hairy purslane	E	No	X
Reptiles				
Chelonia mydas	Green turtle Central-North Pacific DPS	T	Bunker CDZ, Over the Beach Landing Area, Divers Landing, Waiapuaa Bay Landing Area, South Launch Area	No
Birds				
Oceanodroma castro	Band-rumped storm-petrel Hawaii DPS	E	X*	X[1]
Pterodroma phaeopygia sandwichensis	Hawaiian petrel	E	X*	X[1]
Puffinus auricularis newelli	Newell's shearwater	T	X*	X[1]
Anas wyvilliana	Hawaiian duck	E	X	No
Branta sandvicensis	Nene	T	X	No
Fulica americana alai	Hawaiian coot	E	X	No
Gallinula chloropus sandvicensis	Hawaiian common gallinule	E	X	No
Himantopus mexicanus knudseni	Hawaiian stilt	E	X	No
Mammals				
Lasiurus cinereus semotus	Hawaiian hoary bat	E	X	No
Neomonachus schauinslandi	Hawaiian monk seal	E	X	X

*Observed flying over/or known to fall out over PMRF.
[1]Although listed seabirds have the potential to occur at Kaula Island, they have not been recorded on the island.
Notes: DPS = Distinct Population Segment, E= Endangered, T = Threatened.
Sources: (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022; Naval Facilities Engineering Systems Command Hawaii, 2023)

Nene (*Branta sandvicensis*). The nene, or Hawaiian goose, was ESA-listed as endangered in 1967 with an estimate of fewer than 300 birds in the wild (U.S. Fish and Wildlife Service, 2004). Through captive breeding programs, predator control efforts, and dedicated conservation areas, the nene population numbers began to rise throughout the Hawaiian Islands. The 2017 statewide nene population estimate was 3,252 birds, in comparison to an estimated 2,855 birds in 2015 (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022). The population on Kauai in 2017 was estimated at 1,482 birds and is believed to be stable and increasing. In 2019, the nene population was estimated at 3,252 and the species was reclassified to threatened. The 2022 annual nene population survey estimated 3,862 individuals throughout Hawaii, with 2,430 of those on Kauai (U.S. Fish and Wildlife Service, 2022). Nene are present year-round at Barking Sands. They are most commonly observed nesting at Kinikini Ditch, the oxidation pond complex, Hawaii Air National Guard complex, Terminal High Altitude Area Defense complex, and the beach cottages area. They are often also

observed foraging in open grassy areas in the central and southern portions of Barking Sands, as well as occasionally in the field north of Nohili Ditch (Naval Facilities Engineering Systems Command Hawaii, 2023). Nene are adaptable to human-modified habits, and predator control at Barking Sands ensures the nene continue to utilize the installation as habitat.

Hawaiian Duck (*Anas wyvilliana*). The Hawaiian duck was ESA-listed as endangered March 11, 1967 (32 FR 4001). As a waterbird, they are known to forage and reside in aquatic areas on Barking Sands, including the ditch and oxidation pond (Figure 3.5-12). Hawaiian ducks are known to occur within the ROI at Barking Sands. Breeding occurs year-round at PMRF, with the peak being April through September (Naval Facilities Engineering Systems Command Hawaii, 2023).

Hawaiian Common Gallinule (*Gallinula chloropus sandvicensis*). The Hawaiian common gallinule was ESA-listed as endangered March 11, 1967 (32 FR 4001). As a waterbird, they are known to forage and reside year-round in aquatic areas on Barking Sands, including the Nohili Ditch and oxidation pond (Figure 3.5-12). Breeding occurs year-round at PRMF, with the peak being March through August (Naval Facilities Engineering Systems Command Hawaii, 2023).

Hawaiian Coot (*Fulica alai*). The Hawaiian coot was ESA-listed as endangered October 13, 1970 (35 FR 16047). Similar to the gallinule, Hawaiian coots are known to forage and reside year-round in aquatic areas on Barking Sands, including the Nohili Ditch and oxidation pond (Figure 3.5-12). Breeding occurs year-round at PRMF, with the peak being April through September (Naval Facilities Engineering Systems Command Hawaii, 2023).

Hawaiian Stilt (*Himantopus mexicanus knudseni*). The Hawaiian stilt was ESA-listed as endangered October 13, 1970 (35 FR 16047). Hawaiian stilts are generally found year-round in the same habitat as Hawaiian coots: within the facility's ditches, at the oxidation pond, and within wetland areas along the center of the installation immediately east of the installation boundary (Figure 3.5-12) (Naval Facilities Engineering Systems Command Hawaii, 2023).

Band-rumped Storm-petrel (*Oceanodroma castro*), Hawaiian Petrel (*Pterodroma phaeopygia sandwichensis*), and Newell's Shearwater (*Puffinus auricularis newelli*). Newell's shearwater was ESA-listed as threatened in September 1975 (40 FR 44149), the Hawaiian petrel was ESA-listed as endangered in October 1967 (32 FR 4001), and the band-rumped storm-petrel was ESA-listed as endangered in September 2016 (81 FR 67786). All three seabird species spend the majority of their lives at sea, forage in the open ocean, and breed on Kauai. Beginning in March and April of each year, adults initiate breeding in colonial nesting grounds at high elevations in the interior portions of the island and fly over PMRF when traveling between nesting grounds and foraging areas on the open ocean. Fledglings travel from the nesting colony to the sea in the fall, with potential to fly over PMRF. These species only fly to and from their burrows at night and depend on the moon and starlight for navigation. Due to this, the presence of unshielded light along their flyways can result in confusion and disorientation. Newell's shearwaters and Hawaiian petrels pass over PMRF in significant numbers with an estimated 92 birds per night and an estimated total of 5,128 during the fall sampling period (Naval Facilities Engineering Command Pacific, 2022).

***Panicum niihauense* and Critical Habitat**. Potential ESA-listed plant species at Barking Sands include *Panicum niihauense*, a species of grass that was listed as endangered in 1996 (61 FR 53108). Surveys in 2023 identified four *Panicum niihauense* individuals just north of Barking Sands Barking Sands at Polihale State Park (Naval Facilities Engineering Systems Command Pacific, 2023). Although *Panicum niihauense* has not been observed during surveys of Barking Sands, USFWS designated 139.6 acres of (unoccupied)

critical habitat along beach strands and sand dunes on Barking Sands property (Figure 3.5-12, Figure 3.5-13, and Figure 3.5-14). Of that 139.6 acres, approximately 106.1 acres are located in the northern portion of Barking Sands property (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022). In addition, designated critical habitat for *Panicum niihauense* is not present within the ROI. Therefore, *Panicum niihauense* critical habitat is not discussed further.

Kaula Island

Portulaca villosa. *Portulaca villosa* was ESA-listed as endangered on September 30, 2016 (81 FR 67786). The best available documentation of *Portulaca villosa* is cited in the 1980 Environmental Impact Assessment for the Kaula Island Target. The report indicated that *Portulaca villosa* (then known by *Portulaca caumii*) is most common on the northern half of the island on the ridge "where mats of 12 to 14 inches in diameter were found". This observation was attributed to ground surveys conducted in 1932 (prior to ordnance training on the island) (U.S. Department of the Navy, 1980). A 1998 ground survey at Kaula Island cited presence of *Portulaca villosa* as "occasional" but did not provide any further geographic, abundance, or distribution information and is therefore not considered a reliable source for the species presence on Kaula Island. No ground surveys have been conducted since 1998; sea-based or aerial surveys would likely be unable to identify the presence of this species on Kaula Island. The species presence has not been recorded since 1998 (U.S. Fish and Wildlife Service, 2021b). Species population information is limited, and reliable documentation of the species occurred prior to ordnance training on the island. Therefore, it is unlikely that the species would be present in the small portion of the island that has been used for ordnance training since 1952; however, additional drone surveys are anticipated at Kaula Island to verify presence or absence. Therefore, *Portulaca villosa* is not discussed further.

Hawaiian monk seals. Hawaiian monk seals are known to frequent two main areas on the north and central portion of the west side of the island (outside of the ROI). Surveys between 2013 and 2023 have indicated that populations on the island have remained stable (see Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023). The 2023 aerial survey of seabirds and marine mammals at Kaula Island identified 13 Hawaiian monk seals resting on the west side of Kaula, majority on the northernmost portion and outside of the ROI.

Sea turtles. Sea turtles have the potential to occur in the water surrounding Kaula Island; however, they have not been observed on Kaula Island, and no suitable nesting or basking habitat is present (Commander United States Pacific Fleet, 2021; Naval Facilities Engineering Command Pacific, 2022). Listed seabirds have potential to occur at Kaula Island; however, avian surveys conducted on Kaula from 1932 to 2023 have not identified the occurrence of any ESA-listed bird species (Table E-13, Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023) (Naval Facilities Engineering Systems Command Hawaii, 2023; Normandeau Associates Inc & Air Data Solutions, 2023; Normandeau Associates Inc. & APEM Ltd. Joint Venture, 2021). Additional drone surveys are anticipated to be conducted at Kaula Island. As such, potential impacts on ESA-listed seabirds on Kaula Island are not discussed further.

3.5.5 Environmental Consequences

Impacts on biological resources would be significant if species or habitats of high concern are negatively affected over relatively large areas. Impacts are also considered significant if disturbances from the Proposed Action cause reductions in population size or distribution of a species of high concern.

The Proposed Action includes incorporation of appropriate and relevant SOPs that would avoid and minimize potential impacts on terrestrial biological resources with implementation of the Proposed

Action. In addition, appropriate mitigation measures associated with previous consultations would be implemented as necessary to further minimize impacts as a result of the Proposed Action (see Appendix C, Agency Correspondence). Relevant SOPs and mitigation measures are listed in Table 3.5-3.

Table 3.5-3: SOPs and Mitigation Measures for Terrestrial Biological Resources

Protection Focus	Measure
SOPs	
Wildfire	• Prior to all launches and live-fire events at PMRF, surrounding vegetation will be wet to reduce the risk of fire. • Emergency fire crews will be available during launches to quickly extinguish any fire and minimize its effects.
Vegetation	• All personnel will be briefed on avoiding undue impacts on vegetation on Barking Sands. • All equipment and vehicles will be washed/blown between locations to stop spread of invasives. • Existing cleared areas, trails, and roads will be used. • Per the 2014 PMRF Biological Opinion, there will be no trimming or removal of trees 15 feet or taller during Hawaiian hoary bat pupping season (June 1–September 15) (U.S. Fish and Wildlife Service, 2014).
Lighting	• For activities during the Dark Skies period (15 September to 15 December), all personnel will receive training on the PMRF Dark Skies Program Briefing & Natural Resources Training and Shearwater Fallout Instructions. • Night lighting will be shielded to the extent practical to minimize effects on night flying birds (Newell's shearwater and petrels), Hawaiian hoary bat, and green sea turtles. Night lighting can disorient turtle hatchlings and should be shielded from turtle nests, or nests shielded from lights. • Activities requiring night lighting will occur outside of seabird breeding and fallout season to the maximum extent practicable. • Red lights will be utilized to reduce impacts on wildlife if night lighting is necessary.
Amphibious Landings	• Prior to amphibious landings and other activities that may affect the sandy beaches, beaches will be surveyed 1 hour prior to beach landing exercises. If protected species are present, then training activity is delayed until the animal(s) voluntarily leaves the area. • Amphibious activities would only occur outside of the designated buffer zone. Any identified sea turtle nests in this area will be flagged and avoided.
UAS Capture Netting	• Capture netting for UAS would be installed only during training activities and would be taken down once activities have been concluded.
Electromagnetic Radiation	• Radars used during flight tests will not be directed toward the ground and will have a lower limit of 4–5 degrees above horizontal, which would preclude electromagnetic radiation impacts on terrestrial biological resources.
Nene and Waterbirds	• Hazing dogs will be used to deter nene from the MDA Hard Stand launch area. Under the ESA 4(d) Rule for Hawaiian geese, hazing is authorized for only non-breeding nene. Consultation is currently underway to request incidental hazing of waterbirds and nene. • PMRF has installed signs and rumble stripes along roadways where nene are known to occur to reduce car collisions. • A 25-mile-per-hour speed limit from 6 p.m. to 6 a.m. is implemented along the stretch of road most used by nene. Vegetation is managed back 10 feet from pavement along this stretch of road to discourage nene.

Protection Focus	Measure
Kaula Island	• Per FACSFAC PH 3120.4 Scheduling & Operations Instruction: o Ordnance delivery is restricted to the first 1,000 feet of the southeast tip of the island. o To avoid bird strike, aircraft are to remain above an altitude of 1000 ft. o Only the use of inert ordnance is permitted. o Before firing by any aircraft, pre-surveys will be conducted to determine if boats, people, or humpback whales are in the surrounding water or vicinity of the island; or if monk seals are on the ledges around the southern impact area. Presence of any of the above mentioned prohibits ordnance delivery until areas are cleared. Units cannot attempt to provoke clearing of monk seals and humpback whales. • If *P. villosa* or ESA-listed seabirds are detected during upcoming drone surveys at Kaula Island, the Navy will notify USFWS and conduct additional consultation as necessary. Additionally, the Navy will coordinate with USFWS to develop conservation measures that promote the recovery of the species, if determined necessary, to address threats to the species while supporting military training on the island. The Navy would incorporate any such measures into the PMRF Integrated Natural Resources Management Plan.
Mitigation Measures	
Electromagnetic Radiation Effects on Hawaiian Hoary Bat	• Management and operations requirements with respect to the Hawaiian hoary bat stem from a USFWS informal section 7 consultation letter regarding ARDEL facility operations (U.S. Fish and Wildlife Service, 2009). The USFWS requires the area to be surveyed using an Anabat™ bat detector or the facilities' closed-circuit television cameras prior to operation of radar units at night. If one or more bats are present in the area of impact, radio frequency emission may not begin until the bat(s) has left of its own accord (Naval Facilities Engineering Systems Command Hawaii, 2023).

Notes: PMRF = Pacific Missile Range Facility, ESA = Endangered Species Act, FACSFAC PH = Fleet Area Control and Surveillance Facility, Pearl Harbor, ARDEL = Advanced Radar Detection Laboratory, USFWS = U.S. Fish and Wildlife Service, MDA = Missile Defense Agency

3.5.5.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities, and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation listed in Table 1.6-1. Impacts on terrestrial biological resources would remain as they do today, and activities would continue with the same SOPs and measures as presently conducted. Proposed land-based training and testing activities would not occur, and there would be no change in designated training areas. Therefore, no significant impacts on terrestrial biological resources would occur as a result of implementation of the No Action Alternative.

3.5.5.2 Proposed Action

3.5.5.2.1 Barking Sands

Vegetation

Under the Proposed Action, there would be no changes in the type of land-based training and testing activities that currently occur at Barking Sands. However, the continuation of these activities would occur at increased numbers depending on the activity type (Table 2.1-1). Damage to vegetation from movement of personnel, vehicles, and equipment across the beach and into upland areas during

Amphibious Warfare Training is not likely since the movement would be limited to existing routes that are regularly used for this activity. Damage to vegetation from other activities such as bivouacking and ground maneuvers is also unlikely since troops would stay within previously disturbed areas. Troops would be instructed on and comply with SOPs to avoid impacts on vegetation. Equipment and vehicles would be blown/washed down in a controlled facility between locations to limit the spread of invasive weeds and plants as noted in Table 3.5-3.

Missile, rocket, and aerial target drone launches are currently conducted at North Launch Areas 1 and 2 would continue to be conducted at these areas under the Proposed Action. During these types of activities, ground disturbance may occur during implementation of the stabilizing system that would disturb 18 inches of ground below the surface. This ground disturbance is minimal, localized, and would not significantly impact vegetation communities (see Appendix A, Military Readiness Activity Descriptions). In accordance with SOPs and established wildfire mitigation measures, launch pads are kept clear of vegetation, and surrounding areas are maintained/landscaped. Analysis provided in the Strategic Target Systems EIS (U.S. Army Strategic Defense Command, 1992) concluded that although vegetation near the Strategic Target System Launch pad can suffer some temporary distress from the heat generated at launch and emissions, there is no evidence of any long-term adverse effect on vegetation from two decades of launches at Barking Sands (U.S. Department of the Navy, 2008a).

For these reasons, it is unlikely that an increase in the tempo of ongoing activities would significantly impact vegetation at Barking Sands. Therefore, with continued implementation of the SOPs and mitigation measures listed in Table 3.5-3, impacts on vegetation would not be significant at Barking Sands.

Wildlife

North Launch Area 1. Proposed activities at North Launch Area 1 include the same type of training and testing activities that currently occur (launches, launch set up, C5ISRT, and ground maneuvers). However, proposed activities would occur at different tempos than baseline (Table 2.1-1). Under the Proposed Action, annual launch activities would decrease from the baseline; however, launch set up and C5ISRT activities would increase.

Noise from increased personnel presence and vehicles associated with launch set up and C5ISRT may temporarily displace birds and other wildlife species. Wildlife may avoid the areas while activities occur and then return once activities are complete. Increased frequency of these activities may result in more instances where wildlife flee the area; however, training and testing activities are not new to the area and would be short term. Any temporarily displaced wildlife due to the firing event would likely return to the area once the activities conclude as previously analyzed in the 2008 HRC EIS (U.S. Department of the Navy, 2008a).

Increased C5ISRT activities may result in an increased potential of electromagnetic radiation exposure to wildlife. Potential exposure would be limited to birds, as terrestrial species would be below the beam of any ground-based tracking radar (U.S. Department of the Navy, 2008a). The potential for impacts on birds and other wildlife was addressed in the Ground-Based Radar Family of Radars EA (U.S. Army Space and Strategic Defense Command, 1993). The study determined that a bird would need to hover within the radar beam for an extended period of time to be at risk of any adverse effects from electromagnetic radiation. As hovering is not a behavior observed in the bird species found on Barking Sands, the potential for exposure would be highly unlikely.

Some activities occurring at North Launch Area 1 would require lighting to support night operations (Appendix A, Military Readiness Activity Descriptions). Artificial lighting has the potential to affect terrestrial wildlife through attraction and disorientation. Hawaiian seabirds are particularly affected by artificial lights, especially fledglings making their first flights to the ocean from their natal colonies. Effects are greatest during seabird fledgling season, from September 15 to December 15. To minimize impacts, all lighting would be in compliance with the SOPs listed in Table 3.5-3.

In summary, all proposed increases activities would be short in duration and occur within regularly used training and testing sites. In addition, there would be no change in the type of training and testing activities or the current location where training and testing occurs. Therefore, with continued implementation of SOPs as listed in Table 3.5-3, impacts on wildlife would be less than significant at North Launch Area 1.

North Launch Area 2. Similar proposed increases in training and testing activities would occur at North Launch Area 2 as analyzed under North Launch Area 1 (launch setup, C5ISRT). Other proposed training and testing activities at North Launch Area 2 include an increase from 9 to 20 annual launches and an increase in artillery training activities from one to three annually (see Chapter 2, Description of Proposed Action and Alternatives).

Launches and artillery exercises would result in short-term increased noise levels in the area during such events. Noise from these activities may result in startle responses of nearby wildlife. Startle responses of birds may result in flushing from their roosts or birds leaving their nests, which could result in damage or loss of chicks or eggs. However, this startle reaction would be of short duration. Sound associated with launches is generally short in duration, with scheduled launches all under seven seconds. Under the Proposed Action, launches could increase from 26 to 39 (Table 2.1-1). As such, an increase in launch-related noise disturbances to wildlife would be brief and is not likely to result in long-term impacts on individual or populations of wildlife species. This conclusion is further supported by a study conducted for a rookery at Kennedy Space Center (Cape Canaveral Air Station) used by wood storks and other species of wading birds located approximately 2,461 feet from a shuttle launch pad. Based on the study, the rookery continued to be used successfully, even though it has received peak sound levels of up to approximately 138 dBA (U.S. Department of the Navy, 2008a). The study also noted that monitoring of birds during the breeding season indicated that adults respond to shuttle noise by flying away from the nest but return within two to four minutes. In addition, birds within 820 feet of Titan launch complexes at Cape Canaveral Air Station showed no mortality or reduction in habitat use from the 170 dBA sounds levels from Titan IV launches (U.S. Department of the Navy, 2008a). Under the Proposed Action, sound levels at 200 feet for most flight vehicles and weapons systems averages 125.5 dBA, with the loudest (Aegis readiness assessment vehicles) at 138 dBA. Although birds would be exposed to a maximum level of 138 dBA if in the immediate vicinity of a launch, levels would likely be less as North Launch Area 2 is landscaped and not considered high-quality habitat for birds or other wildlife. For more information on noise under the Proposed Action, see Section 3.3 (Noise). Wedge-tailed shearwaters are known to nest in the immediate coastal environment around North Launch Area 2 and nearby Nohili ditch, and Laysan albatross are known to loaf in and around North Launch Area 2. Based on conclusions from Cape Canaveral studies and maximum received sound levels of 138 dBA, birds may fly away from a nest or roost during a launch at Barking Sands but would likely return soon after. In addition, wildlife species have occurred at Barking Sands for decades during current launch activities, and no adverse effects have been observed. Wildlife species continue to use the habitats of Barking Sands before, during, and after launch operations.

Artillery exercises would occur at North Launch Area 2 and would result in a short-term noise disturbance that may result in the temporary flushing of birds and other wildlife. The annual activities would only increase from one to up to three under the Proposed Action. Birds and wildlife may exhibit a startle response and temporarily leave the area, but would be expected to return once activities are complete with no long-term impacts on birds or other wildlife.

In summary, all proposed training and testing activities would be short in duration and occur within regularly used training and testing sites. In addition, there would be no change in the type of training and testing activities or the location where they are currently conducted and all SOPs would be adhered to. Therefore, with implementation of the SOPs as listed in Table 3.5-3, impacts on wildlife would be less than significant at North Launch Area 2.

South Launch Area. Similar proposed increases in training and testing activities would occur at South Launch Area as analyzed under North Launch Areas 1 and 2 (launch set up and C5ISRT). Similar to North Launch Areas 1 and 2, surrounding habitat on the site is maintained and would not be considered high quality habitat for birds or other wildlife. Wedge-tailed shearwaters are known to breed in nearby coastal environment; however, impacts are not likely to be significant for the same reasons analyzed under North Launch Area 1 and North Launch Area 2. All proposed training and testing activities would be short in duration and occur within regularly used training and testing sites. In addition, there would be no change in the type of training and testing activities or the location where they are currently conducted and all SOPs would be adhered to as listed in Table 3.5-3. Therefore, impacts on wildlife would be less than significant at the South Launch Area.

Palai Olani Area. Proposed activities at Palai Olani area includes an increase from the baseline for amphibious landings (small boat operations and swimmer insertion/extraction) (from 4 to 21 activities annually) and bivouac (from one to six activities annually) (see Chapter 2, Description of Proposed Action and Alternatives). Wedge-tailed shearwaters are not known to be present or nest in or around Palai Olani and therefore would not be disturbed. Laysan albatross nest in the vegetation backing up to the dune, however this area would likely remain undisturbed. Further, any eggs found in the vicinity are moved by PMRF biologists and taken to suitable habitat away from military activities to discourage nesting and species presence. As such, Laysan albatross are unlikely to be present. Disturbance to wildlife from increased personnel and vehicles may temporarily displace wildlife in the vicinity. However, training and testing exercises would be brief, and any displaced wildlife would return to the area once activities are complete. In addition, there would be no change in the type of training and testing activities or the location at Palai Olani where they are currently conducted. SOPs would continue to be implemented as described in Table 3.5-3. Therefore, impacts on wildlife would result in less than significant impacts at Palai Olani.

Waiapuaa Bay. Proposed activities at Waiapuaa Bay includes an increase from a baseline of 4 to 24 activities annually for amphibious operations (e.g., raid, small boat operations, swimmer insertion/extraction) (see Chapter 2, Description of Proposed Action and Alternatives).

Wedge-tailed shearwaters are known to nest near the access point to the parking lot/staging area. SOPs as listed in Table 3.5-3 are adhered to when conducting activities at Waiapuaa Bay, and no impacts have occurred to wedge-tailed shearwaters as a result of training and testing activities. As such, there would be no change in the type of training and testing activities or the location where training and testing activities are currently conducted and all SOPs would continue to be implemented as described in Table

3.5-3. Therefore, impacts on wildlife from increased tempo of amphibious landings would be less than significant at Waiapuaa Bay.

MDA Hard Stand. Increases in the number of C5ISRT (from 2 to 10 annually) and bivouac activities (from one to up to four activities annually) are proposed at the MDA Hard Stand training and testing site (see Chapter 2, Description of Proposed Action and Alternatives). However, there would be no change in the type of training and testing activities or the location where they are currently conducted, and all SOPs would continue to be implemented as described in Table 3.5-3. Potential impacts on wildlife from these activities would be the same as analyzed above. As such, impacts on wildlife would be less than significant at MDA Hard Stand.

Airfield Bivouac Area. An increase in bivouacking activities from 5 to 26 annual activities at the Airfield Bivouac Area would occur under the Proposed Action (see Chapter 2, Description of Proposed Action and Alternatives). The area is landscaped and in a developed area that would not be considered high-quality habitat for wildlife. In the unlikely event wildlife were present during proposed activities, bivouacking may temporarily displace birds and other wildlife species. Such exercises would be short term, and any displaced wildlife would return to the area once the activities are complete. In addition, there would be no change in the type of training and testing activities or the location where they are currently conducted, and all SOPs would continue to be implemented as described in Table 3.5-3. Therefore, impacts on wildlife from an increase in the tempo bivouac activities at the Airfield Bivouac Area would be less than significant.

Alternate Bivouac Area. Under the Proposed Action, an increase in parachute operations from 1 to up to 16 annual activities would occur at the Alternative Bivouac Area (see Chapter 2, Description of Proposed Action and Alternatives). Bivouacking activities would not increase from the baseline. Operations would occur on regularly used areas, there would be no change in the type of training and testing activities or the location where they are currently conducted, and all SOPs would be adhered to as listed in Table 3.5-3. Therefore, impacts on wildlife would be less than significant at the Alternative Bivouac Area.

FARP Areas. An increase in FARP exercises from 1 to 20 annually would occur under the Proposed Action (see Chapter 2, Description of Proposed Action and Alternatives). FARP exercises would continue to occur in the same location as currently conducted. Additionally, the FARP site is within the PMRF Airfield that conducts frequent flights and landings. Disturbance to wildlife from increased personnel presence, vehicles, generators, and aircraft would be minor given the ongoing aircraft activities associated with the Airfield. FARP activities would require an increase in aircraft operations in the surrounding FARP areas; however, Bird Aircraft Strike Hazard (BASH) potential would not increase due to the ongoing BASH management for the airfield. The FARP area is entirely landscaped and not considered high-quality habitat for wildlife. Although waterbirds are known occur in nearby Kinikini Ditch, any BASH hazards would be managed under the PMRF BASH program and therefore not increase impacts from what was previously analyzed in the 2008 HRC EIS (U.S. Department of the Navy, 2008a). If wildlife is present in the FARP area during training and testing activities, the analysis of noise-related impacts would be similar as analyzed under North Launch Area 2. However, noise levels at the FARP areas would be considerably less, and therefore noise-related impacts would be less than those analyzed at North Launch Area 2. All appropriate SOPs would continue to be implemented to further minimize impacts, as described in Table 3.5-3. Therefore, impacts on wildlife would be less than significant at FARP areas.

UAS Launch Area. Under the Proposed Action, UAS operations at the UAS Launch Area would increase from 2 to 45 annual activities. Activities would occur at the PMRF airfield, a developed and landscaped area that is regularly used for training and testing activities. Capture netting would only be used during training activities and would be taken down once training has concluded. Since capture netting would only be present for brief periods of time, it is not likely birds would be at risk of entanglement. There would be no change in the type of training and testing activities or the location where they are currently conducted. Therefore, impacts on wildlife would be less than significant at UAS Launch Area.

Ground Maneuver Area. An increase from 1 to 22 ground maneuver activities would occur under the Proposed Action. Ground maneuver activities within the Ground Maneuver Area would be limited to regularly used, paved or gravel roads and trails. There would be no change in the type of training and testing activities or the location where they are currently conducted. Increases in ground maneuvers would increase instances of wildlife strike potential. Personnel would continue to adhere to required speed limits to avoid impacts (Table 3.5-3). There could be minor disturbances to wildlife from increased personnel and vehicles at Barking Sands from ground maneuvering activities. However, as previously stated, disturbances would be brief, and wildlife would likely return once activities are complete. As such, impacts on wildlife would be less than significant within the designated Ground Maneuver Areas.

Special-Status Species: ESA-Listed Species

On October 4, 2024, the Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS. On December 3, 2024, the USFWS concurred with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, or the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence).

Hawaiian Hoary Bat. Impacts on the Hawaiian hoary bat from the Proposed Action may result from increased noise levels from launches and radar operations. The majority of proposed activities would take place in training and testing areas that are paved, landscaped/maintained, or have low-growing vegetation. The nearest high quality roosting site (e.g., patch of ironwood [*Casuarina equisetifolia*] trees) for nonvolant Hawaiian hoary bats on Barking Sands is 1,155 feet from launch areas (North Launch Area 1 and 2, South Launch Area). Lower quality roosting habitat (nonnative trees > 15 feet) are in proximity to Launch Area 1, although less likely to support nonvolant bats. Sound levels at 200 feet for most flight vehicles and weapons systems is on average 125.5 dBA, with the loudest (Aegis readiness assessment vehicles) at 138 dBA. At 1,155 feet from North Launch Areas 1 and 2, maximum received noise levels to bats would be 123 dBA. Additionally, sound associated with launches is generally short in duration, with scheduled launches all under seven seconds. All vehicles and weapons have been fired before at Barking Sands and the Navy has no evidence that the short duration of sound during launch events results in adverse effects on bats (Commander United States Pacific Fleet, 2021). Therefore, since all proposed activities have been conducted previously at Barking Sands within regularly used training and testing sites, and there is no evidence that the short duration of launch events result in adverse effects on bats, impacts on Hawaiian hoary bats would be less than significant.

Electromagnetic radiation impacts from radar operations under the Proposed Action would occur at North Launch Area 1, North Launch Area 2, South Launch Area, and MDA Hard Stand. As analyzed above

for birds, bats would need to hover over the radar beam, during a period of operation, for an extended period of time in order to experience negative effects from EMR. Hovering is not a behavior typically observed in bats, so exposure to adult bats is highly unlikely. Potential for exposure to roosting bats or bat pups exists during the bat pupping season (June 1–September 15) when young are non-volant (non-flying), and if trees 15 feet or higher are within the EMR hazard area (284 feet around radar). As previously mentioned, no suitable bat roosting habitat is within 1,155 feet of North Launch Area 1 and North Launch Area 2 or 1,000 feet of South Launch Area, well outside the EMR hazard area of 284 feet. Bat surveys conducted in the vicinity of MDA Hard Stand from June 2020 through June 2021 identified foraging bats in the forest abutting the MDA Hard Stand training and testing site at the same or greater levels than what was surveyed in 2010-2011. As such, ongoing activities at MDA Hard Stand have not had a negative impact on Hawaiian hoary bat population at MDA Hard Stand, and potential impacts under the Proposed Action would not change from what was previously analyzed under the 2008 HRC EIS (U.S. Department of the Navy, 2008a). Although the forest surrounding MDA Hard Stand is comprised of non-native species, trees over 15 feet tall in the kiawe-koa haole scrub could support roosting habitat for bats. (Figure 3.5-6). Management and operations of radars with respect to bats potentially flying within the radar beam stem from a USFWS informal section 7 consultation letter regarding ARDEL facility operations. In accordance with the mitigation measures described in Table 3.5-3, if bats are detected within the vicinity of the radar, the radar would not operate until bats have left the area on their own accord (U.S. Fish and Wildlife Service, 2009). Therefore, impacts on Hawaiian hoary bats from the Proposed Action would be less than significant.

Green Sea Turtle. Green sea turtles may bask and nest on beaches across the installation and therefore may be impacted by the increase in training and testing activities, including launches, live-fire activities, and amphibious landings.

Amphibious landing activities would occur at Palai Olani and Waiapuaa Bay. However, the area of Waiapuaa Bay used for landing activities is located in part of the shoreline not typically used by green sea turtles. Green sea turtles basking and nesting could be disturbed by human and vehicle presence, noise, or direct strike from increased training and testing activities such as increased night lighting due to night activities or bivouac. In accordance with ESA Section 7 consultations on similar activities (U.S. Fish and Wildlife Service, 2021a), Barking Sands has implemented several SOPs for amphibious landings, launches, and live-fire training exercises to minimize potential impacts. Beaches are surveyed one hour prior to landings and launches and, in the event a sea turtle is observed basking on the beach, activities are delayed until the animal leaves on its own accord. Beaches are also be surveyed for sea turtle nests and, if found, are marked and avoided entirely (Table 3.5-3). These measures would continue to be implemented under the Proposed Action. Therefore, impacts would be considered less than significant.

Hawaiian Monk Seal. Hawaiian monk seals are often observed hauled out on the beaches at Barking Sands. At Barking Sands, seals may experience the greatest disturbance from an increase in amphibious landings. PMRF has implemented several SOPs to minimize impacts on seals. Prior to amphibious landings and other activities that may affect the sandy beaches, beaches are surveyed one hour prior to beach landing exercises. If protected species are present, then training activity is delayed until the animal(s) voluntarily leaves the training and testing area (Table 3.5-3). With the implementation of SOPs, impacts on Hawaiian monk seals from an increase in these events would be unlikely as individuals would be avoided. As such, impacts would be considered less than significant.

Nene, Hawaiian Duck, Hawaiian Common Gallinule, Hawaiian Coot, and Hawaiian Stilt. Impacts on ESA-listed birds from the Proposed Action would not change significantly from the baseline as no events

would be conducted in wetlands or known habitat. Increases in ground maneuvers could increase potential vehicle strikes of nene. However, impacts would not be significant with the continuation of signs and speed limits per PMRF SOPs (Table 3.5-3). Impacts from the same activities at Barking Sands have been previously analyzed in the 2021 HRC Re-Initiation Letter of Concurrence (U.S. Fish and Wildlife Service, 2021a) and the Biological Opinion for the Base Infrastructure, Operations, and Maintenance Activities at the Pacific Missile Range Facility Sites on Kauai (U.S. Fish & Wildlife Service, 2025). USFWS determined there to be no adverse impacts with the implementation of SOPs as described in Table 3.5-3. The Proposed Action would not significantly increase impacts on Hawaiian waterbirds and nene. As such, determinations made by previous analyses would remain the same, and impacts on Hawaiian waterbirds and nene would be less than significant.

Newell's Shearwater, Band-rumped Storm Petrel, and Hawaiian Petrel. The Newell's shearwater, band-rumped storm petrel, and Hawaiian petrel are frequently observed flying over training and testing areas and are subject to fallout. However, in 2024 the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect these species with the implementation of SOPs and conservation measures as described in Table 3.5-3. The Proposed Action would not substantially increase night lighting, and activities would be conducted to the maximum extent practicable outside of peak seabird fledging season. Further, all artificial lighting would continue to be shielded in accordance with USFWS guidelines. All other SOPs (including PMRF's Dark Skies Program) would continue to be implemented in order to minimize effects and are described in Table 3.5-3. Therefore, impacts on Newell's shearwater, Band-rumped storm petrel, and Hawaiian petrel would be less than significant.

Special-Status Species: MBTA-Listed Species

Impacts on MBTA-listed species from the proposed training and testing activities and associated noise would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species protected under the MBTA.

3.5.5.2.2 Kaula Island

Vegetation

Under the Proposed Action Alternative, there would be no change in the type of training and testing activities that occur on Kaula Island. However, there would be an increase in the tempo for GUNEX (from 14 to 24 annual activities) and BOMBEX (from 12 to 31 annual activities) activities (Table 2.1-1). Although inert weapons lack ignition or explosive capabilities, their impact and potential ricochets can, on exceedingly rare occasions, generate sparks leading to vegetation fires. Nevertheless, potential vegetation impacts would be less than significant because the island's vegetation is very sparse, and gunnery and inert ordnance practice would continue to be confined to only 8 percent of the island. Brush fires from these activities are highly unlikely, and there have been no reports of fires from previous training activities. This is consistent with previous analysis in the 2008 HRC EIS (U.S. Department of the Navy, 2008a). Therefore, impacts on vegetation on Kaula Island would be less than significant.

Wildlife

As mentioned above, no change would occur in the type of activities, only the tempo at Kaula Island. Noise from increased numbers of inert munitions impacts, weapons firing, and aircraft could result in

birds exhibiting a startle response in which they would temporarily leave the area. Startle responses of birds may result in flushing from their roosts or birds leaving their nests, which could result in damage or loss of chicks or eggs. However, this startle reaction would be short term and birds would be expected to return once activities are complete, with no long-term impacts on seabird populations. Seabirds on Kaula Island have been surveyed from 1932 through 2023, and surveys indicate that the seabird composition of the island has remained very consistent over time despite ongoing GUNEX and BOMBEX activities conducted on the island (see Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023) (Naval Facilities Engineering Systems Command Hawaii, 2023). All activities would occur on a small portion within the first 1,000 feet of the southeast tip of the island and would continue to adhere to the SOPs described in Table 3.5-3. As such, impacts on wildlife would be less than significant.

Special-Status Species: ESA-Listed Species

Hawaiian Monk Seal. Proposed increases in GUNEX and BOMBEX activities may impact Hawaiian monk seals hauled out at Kaula Island. Impacts on Hawaiian monk seals from increases in similar activities were previously analyzed in the 2018 Hawaii-Southern California Training and Testing Biological Opinion. The NMFS concluded that the rate at which Hawaiian monk seal populations are increasing has not been affected by Navy training and testing activities in the Hawaiian Range Complex (which includes Kaula Island) (National Marine Fisheries Service, 2018). In addition, monk seals are known to haul out on rocky ledges at sea level outside of the ROI. Per SOPs, if monk seals are observed hauled out on Kaula Island, any planned ordnance delivery is prohibited (Table 3.5-3).

For these reasons, an increase in the tempo of training and testing activities would not result in greater disturbance to Hawaiian monk seals than what is currently conducted at Kaula Island. Therefore, impacts on Hawaiian monk seals under the Proposed Action would be less than significant.

Special-Status Species: MBTA-Listed Species

The impacts on MBTA-listed species from the proposed training and testing activities and associated noise at Kaula Island would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species on Kaula Island protected under the MBTA.

3.5.5.3 Conclusion

Proposed training and testing activities could result in minor and short-term elevated noise levels. At PMRF, activities conducted on unpaved areas would occur on maintained landscaped or low-quality habitat within areas regularly used for training and testing activities. Artificial night lighting would be minimal and limited to short-term events. Impacts would be short term and no long-term impacts would occur under the Proposed Action. SOPs as listed in Table 3.5-3 would be implemented to minimize impacts from invasive species, noise, and physical disturbance to wildlife.

Barking Sands – ESA-Listed Species

Impacts on ESA-Listed species at Barking Sands could result from temporary increases in noise, increases in radar operations, increases in personnel and vehicle movements, and the use of artificial lighting at night. However, increases in noise would be short term. Activities conducted on unpaved areas would occur on maintained landscaped or low-quality habitat within areas regularly used for training and testing activities. Artificial night lighting would be minimal and limited to short-term events. Impacts would be short term, and no long-term impacts would occur under the Proposed Action. Established

SOPs would continue to be implemented to minimize impacts on Endangered Species Act (ESA)-listed species. Therefore, impacts would be less than significant.

Informal consultation under Section 7 of the ESA was conducted with the USFWS to address potential impacts on ESA-listed terrestrial species with implementation of the Proposed Action. The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence).

Barking Sands – MBTA-Listed Species

Impacts on MBTA-listed species from the proposed training and testing activities and associated noise would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species protected under the MBTA.

Kaula Island – ESA-Listed Species

Increases in GUNEX and BOMBEX activities may impact Hawaiian monk seals hauled out at Kaula Island. Monk seals are known to haul out on rocky ledges at sea level outside of the designated ordnance delivery area. Per established SOPs, if monk seals are observed hauled out on Kaula Island, any planned ordnance delivery is prohibited. Therefore, impacts under the Proposed Action on Hawaiian monk seals would be less than significant.

Informal consultation under Section 7 of the ESA was conducted with the USFWS to address potential impacts on ESA-listed terrestrial species under the Proposed Action. The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence).

Kaula Island – MBTA-Listed Species

The impacts on MBTA-listed species from the proposed training and testing activities and associated noise at Kaula Island would be similar to those described above for wildlife. Therefore, impacts are expected to be minimal and short term and would not result in a significant adverse effect on populations of any bird species on Kaula Island protected under the MBTA.

Therefore, impacts on terrestrial biological resources would be less than significant as a result of implementation of the Proposed Action.

3.6 Cultural Resources

3.6.1 Definition of Resource

Cultural resources, to include historic properties, consist of prehistoric and historic sites, structures, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or any other reason.

Cultural resources are limited, nonrenewable resources whose value may be easily diminished by actions impacting their integrity and can include, but are not limited to, the resources described subsequently. Archaeological resources (prehistoric and historic) are locations where human activity measurably altered the earth or left deposits of physical remains. While many archaeological sites consist only of subsurface materials, others may include remnant surface ruins, structures, or components related to subsurface materials. Architectural resources include standing buildings, structures, landscapes, and districts composed of one or more of these resource types. Resources of traditional, religious, or cultural significance can include archaeological resources, sacred sites, buildings, structures, districts, prominent topographic features, landscapes, habitats, plants, animals, minerals, or social institutions considered essential for the preservation of traditional culture. A TCP, while not defined in law or regulation, is defined by the National Park Service as a resource that is eligible for inclusion on the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community (National Park Service, 2024). The term has come to be widely used within the historic preservation community as synonymous with the term "properties of traditional religious and cultural importance" referred to in the NHPA and its implementing regulations (54 U.S.C. 302706). When the terms traditional cultural property, traditional cultural place, or the abbreviation TCP is used, it means properties of traditional religious and cultural importance as defined under the NHPA.

Cultural resources include historic properties as defined under the NHPA of 1966. Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included on, or eligible for inclusion on, the NRHP (36 CFR part 60). "Historic properties" include artifacts, records, and remains that are related to and located within such properties (36 CFR 800.16(1)). As outlined in 36 CFR part 60, to be eligible for listing in the NRHP, a property must retain integrity and meet one of the four criteria below:

- Associated with events that have made a significant contribution to the broad patterns of our history (Criterion A);
- Associated with the lives of persons significant in our past (Criterion B);
- Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C); and/or
- Have yielded or be likely to yield information important in prehistory or history (Criterion D).

Properties that are less than 50 years old can be considered eligible for the NRHP under Criterion Consideration G if they possess exceptional historical importance. Those properties must also retain historic integrity and meet at least one of the four NRHP criteria (Criteria A, B, C, or D). The term "historic property" refers to National Historic Landmarks, NRHP-listed, and NRHP-eligible cultural resources. Further detail regarding the regulations applicable to cultural resources are included in Section 3.6.2 (Regulatory Setting).

3.6.2 Regulatory Setting

NEPA is a procedural statute intended to ensure Federal agencies consider the environmental impacts of their actions in the decision-making process, including impacts on cultural resources. Effects on cultural resources under NEPA include ecological, aesthetic, historic, cultural, economic, social, or health; whether direct, indirect, or cumulative.

NEPA's analysis incorporates a broad range of federal laws, regulations, and executive orders, including Archaeological and Historic Preservation Act of 1974 (16 U.S.C. section 469) as amended, the American Indian Religious Freedom Act of 1978 (42 U.S.C. section 1996), the Archaeological Resources Protection Act of 1979 (16 U.S.C. sections 470aa–470mm), the Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. section 3001, et seq.), and the NHPA of 1966 (54 U.S.C. 300101 et seq.) and its associated regulations (36 CFR part 800).

Section 106 of the NHPA (54 U.S.C. section 301608) mandates that federal agencies with jurisdiction over a proposed federal or federally assisted undertaking in any State shall take into account the effect of the undertaking on any historic property, and shall seek to avoid, minimize, or mitigate adverse effects on historic properties (36 CFR section 800.1[a]). The process for implementing Section 106 is codified by 36 CFR part 800, Protection of Historic Properties. A property is considered significant if it meets one or more of four criteria listed earlier in Section 3.6.1 (Definition of Resource).

Significant historic and archaeological resources are present at Barking Sands and Kaula Island. As a steward of cultural resources, the Navy must comply with federal regulations related to those resources. The analysis in this EA addresses cultural resources compliance at PMRF in accordance with applicable Integrated Cultural Resources Management Plan (ICRMP) SOPs and Navy agreements (U.S. Department of the Navy, 1999a, 2011, 2012c) which outline avoidance measures, minimization efforts, and best management practices (BMPs) regarding protection of cultural resources and historic properties.

3.6.2.1 Implementation of the 2012 Programmatic Agreement

NHPA's implementing regulations seek to accommodate historic preservation concerns with the needs of federal undertakings through consultation among the agency and other parties with an interest in the effects of the undertaking on historic properties. For this Proposed Action, the Navy is meeting its responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (U.S. Department of the Navy, 2012c). The 2012 PA is an established Section 106 program alternative that provides a framework for professional review and assessments of effects, responses to post-review discoveries and emergencies, periodic reporting, and processes for participation by NHOs and consulting parties. In accordance with the 2012 PA, all training and testing activities would be reviewed in advance by qualified subject matter experts to confirm the effectiveness of measures to avoid and minimize harm to historic properties. At SHPD's request, Commander, Navy Region Hawaii will commit to quarterly reporting of activities reviewed under Stipulation XII in the PA, in addition to the annual report.

Following the publication of the Draft EA in August 2024, the Navy received public comments regarding the religious and cultural significance of Kaula Island to Native Hawaiians and concerns about continued use of Kaula Island by the military for training and testing activities associated with the Proposed Action.

Since November 2024, the Navy has conducted multiple meetings with NHOs, OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and

cultural significance of Kaula Island. The Navy shared information about prior surveys of Kaula Island, conducted additional information gathering and research, and engaged with NHOs regarding traditional knowledge and cultural practices pertaining to Kaula Island. Subsequently, the Navy determined Kaula Island meets the criteria of a TCP eligible for listing in the NRHP and determined that the proposed undertaking would adversely affect the Kaula Island TCP. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the (ACHP, in an effort to resolve adverse effects and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6.

Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island).

3.6.3 Region of Influence

For purposes of this EA, the ROI is comprised of two main areas (Figure 2.1-1):

- Barking Sands (North Launch Area 1, North Launch Area 2, South Launch Area, Palai Olani Area, Waiapuaa Bay Amphibious Staging Area, MDA Hard Stand, Airfield Bivouac Area, Alternate Bivouac Area, FARP Areas, UAS Launch Area, and Ground Maneuver Areas) (see Figures 2.1-2–2.1-12);
- Kaula Island (see Figure 2.1-12).

For historic properties analyzed under the NHPA, the ROI is the Area of Potential Effects, defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist," (36 CFR section 800.16[d]) and thereby diminish their historic integrity.

3.6.4 Affected Environment

3.6.4.1 Existing Conditions

It is Navy policy to protect certain information related to cultural resources from general distribution. The policy is consistent with NHPA and Archaeological Resources Protection Act, which address confidentiality restrictions to prevent the inappropriate release of locational data for archaeological sites and TCPs. Accordingly, this EA does not contain detailed locational descriptions or figures showing the specific locations of archaeological sites or TCPs.

3.6.4.1.1 Barking Sands

Barking Sands is situated on the Mana Plain, which is a low-lying coastal terrace on the western flank of Kauai. Human habitation of the Mana Plain dates back centuries, with the earliest traditional Hawaiian archaeological site dating back to the 11th century. Traditional Native Hawaiian land uses near the ROI include habitation, subsistence activities, burial, and travel. It is likely that permanent settlements were concentrated at the inland edge of the Mana Plain. Small fishing communities, possibly limited to temporary camps, were scattered along the coast. Archaeological evidence suggests inhabitants of the Mana Plain engaged in marine subsistence activities, including fishing and harvesting shellfish. Fishing was not confined to the ocean and shoreline of Mana, 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 aalii shrubs for firewood, hialoa and other plants for medicine, and makaloa and neki for weaving.

Large-scale agriculture was adopted in the Mana Plain in the mid-19th century, introducing sugar cane and rice plantations as well as Chinese, Filipino, and Japanese workers to the area. Cemeteries from these cultures and artifact scatters have been identified as plantation-era resources at Barking Sands.

The U.S. military took ownership of a Hawaii territorial airstrip and activated Barking Sands in June 1940. The base provided support to the Army, Air Force, and Navy through several significant historical events, including World War II, the Cold War, and the National Aeronautics and Space Administration's Man in Space program, among others (U.S. Department of the Navy, 2012b). As a result, archaeological resources such as building ruins and deteriorated structures, roads, and trash dumps associated from past military activities have been identified at Barking Sands.

Coastal dune deposits are extensive areas of archaeological sensitivity present within the PMRF installation. Identified coastal deposits at Barking Sands stretch from Nohili Dunes in the north to the north edge of Waiapuaa Bay. The dune back beach deposits are generally characterized by charcoal-rich sand layers containing shell midden and artifacts. They are interpreted as temporary camps, presumably related to seasonal fishing or other resource collection activities (U.S. Department of the Navy, 2012a). Traditional Hawaiian and some plantation-era burials have also been identified. The coastal dunes of the Mana Plain were the burial grounds of ancient Hawaiians.

The ridges of Mana is an area specifically referred to in Hawaiian literature and oral tradition as a leina-a-ka-uhane, a place (generally cliffs or seacoast promontories) where the spirits of Native Hawaiian ancestors, after death, plunge into eternity. Culturally, spirits are placed in one of the following realms: the realm of the wandering spirits, the realm of the ancestral spirits, or the realm of the endless night. Although historic and modern disturbances have impacted remains of back beach habitation predating World War II, the coastal dune areas of Barking Sands remain culturally sensitive (International Archaeological Research Institute Inc., 2005).

Previous professional identification and evaluation studies at Barking Sands include (1) reconnaissance and surface surveys to identify archaeological sites, (2) subsurface testing and excavation at archaeological sites, (3) ground-penetrating radar surveys to identify subsurface anomalies possibly indicative of cultural deposits, (4) archaeological monitoring projects, and (5) historic research and cultural studies to identify traditional cultural places. Coverage includes nearly all of Barking Sands.

Five historic properties have been identified in three of the training and testing sites, two World War II-era sites and three traditional Hawaiian sites. All sites are located on the Main Base, Barking Sands (Table 3.6-1).

Table 3.6-1: Historic Properties Identified on Barking Sands Within the Training and Testing Areas[1]

SIHP No./Name	Description	Type	Date	NRHP Eligibility Criterion	Training and Testing Area Location
50-30-01-1860	Nohili Dune	TH	Pre-Contact	Eligible; Criteria A and D	North Launch Area 1
50-30-05-2035	Midden deposits and burials	TH	Pre-Contact	Eligible; Criterion D	Palai Olani
50-30-05-2040	Defense revetment	WWII-CW	1941–1991	Eligible; Criterion A	Palai Olani
50-30-05-4016	Habitation (fire pit remnant)	TH	Pre-Contact	Eligible: Criterion D	Waiapuaa Bay
50-30-05-2272	Two WWII gun emplacements	WWII-CW	1941–1991	Eligible: Criterion D	Waiapuaa Bay

[1]Information included as available per the 2012 ICRMP and provided GIS data (U.S. Department of the Navy, 2012a).
Notes: SIHP = State Inventory of Historic Places, TH = traditional Hawaiian archaeological site, WWII-CW = World War II – Cold War

North Launch Area 1. One historic property is located within the North Launch Area 1. Nohili Dune (Site 50-30-01-1860) is a multi-component Traditional Hawaiian archaeological site and TCP that includes Elekuna Heiau[9], dune burials, and evidence of temporary habitation (Table 3.6-1). The Nohili Dune site subsumes four previously recorded Traditional Hawaiian habitation and burial sites (01-0007, 01-0008, 01-0009, and 01-6027). The natural dune system likely extended from within Barking Sands north to Polihale, where the plain ends at the southern edge of the Na Pali.

Referenced in several studies (Bennet, 1931; Ching, 1974; Drolet et al., 1996; Flores & A. Kaohi, 1992; International Archaeological Research Institute Inc., 2005; Nagata, 1994; Soehren, 1965; Thrum, 1907; Wulzen & P.M. Jensen, 1997), the historic property, which is considered eligible for listing in the NRHP, contains cultural deposits, burials, religious and habitation features. Bennett (1931) described 01-0007 as dune burials and campsites between Polihale and Barking Sands; cultural material reported included grooved sinkers, grindstones, adzes, files, and marine shell (U.S. Department of the Navy, 2012a). Thrum (1907) and Bennett (1931)[10] described Site 01-0008 as Elekuna Heiau at the Nohili Dune, with Flores and Kaohi (1992) noting that "It was considered to be a heiau of 'marked distinction' that was visited by King Kalakaua and his priests on various occasions. It was also unique in that it was not constructed of lava stones as the others, but instead was a ledge of sandstone at the base of Nohili dunes" (Flores & A. Kaohi, 1992). Site 01-0009 was recorded by Bennett (1931) as house sites constructed of low stone walls on the inland side on Nohili Dune. Nagata (1994) and Wulzen & P.M. Jensen (1997) report that Site 01-6027 is an eroding midden present containing marine shell, charcoal, and fire-affected rock.

Nohili Dune has played a part in community traditions and served as a destination of visitors following the lure of the legend of the "barking sand," an unusual barking noise made by the sand under certain conditions. Flores and Kaohi write that "its distinction was praised in chants from the earliest of the traditional period and still recounted in recently composed songs of the contemporary period." (Flores & A. Kaohi, 1992). In 2019, the Navy consulted with NHOs and SHPD in advance of proposed conservation work at the Nohili Dune site. Based on prior studies and past discussions with NHOs, the Navy determined the Nohili Dune Site (50-30-01-1860) was a TCP and eligible for inclusion in the NRHP. In 2020, the Hawaii SHPD concurred with the determination.

Palai Olani. Two historic properties are located within the boundaries of Palai Olani training and testing site that are eligible to be listed in the NRHP (Table 3.6-1). Site 50-30-05-2040 is a revetment associated with airfield development and defense against possible attack in World War II. The site is a "double horseshoe" or "M" shape revetment that includes graveled pavement extending from revetment toward the runway (Wulzen & P.M. Jensen, 1997). Training conducted within World War II defense structures such as this revetment is considered continual and beneficial use to the military and training mission. Site 50-30-05-2035 is a large traditional midden deposit containing several other cultural sites and materials including fire-affected rock, water-worn rock, basalt debitage, marine shell, human burials, flakes, marine shell, charcoal, and ash. The deposit is visible as distinct dark layers from 3 to 78 centimeters observed in exposed portions of the seaward dune face and spans nearly 900 meters along the coastal dunes and extends nearly 30 meters inland. It encompasses previously identified burials (Sites 05-1831 and 05-1884) as well as two bone exposures that have not been assigned SIHP numbers (International Archaeological Research Institute Inc., 2005). Due to prior disturbance from installation activity and environmental factors such as wave and wind activity, archaeological sites within the dune

[9] Elekuna Heiau has not been relocated since documentation in the 1930s.
[10] Some sites identified by Bennett have not been relocated since original recording.

are largely not in-situ. Training activities conducted near the site are restricted to remain within maintained corridors or pathways approved by PMRF. Training activities are limited to previously disturbed areas and shall avoid cultural resources.

Waiapuaa Bay. Two historic properties are located within Waiapuaa Bay training and testing site. One is on the north side of Waiapuaa Bay (Site 50-30-05-4016) and is located inland from Waiapuaa Bay and the existing recreational cottages on the back beach. This site is a fire pit exposed at 85 centimeters below surface in a 27-meter-long backhoe trench. The fire pit occurred at the interface of two layers, neither of which contained evidence of cultural use. A charcoal sample from the fire pit yielded a radiocarbon date ranging from the 12th to the 14th century, making it the earliest dated evidence of human activity on the southwest coast of Kauai (Sweeney, 1994). The other historic property, Site 50-30-05-2272, is located inland from Waiapuaa Bay and the existing Morale, Welfare, and Recreation camping area on the back beach. The site consists of two World War II gun emplacements constructed with concrete blocks and mortar. These two aboveground keyhole-shaped enclosures include circular portions with poured concrete floors and rectangular portions with soil floors.

3.6.4.1.2 Kaula Island

Located approximately 20 NM off Niihau, Kaula Island is uninhabited by humans due to its remoteness, high winds, steep slopes and instability of the island's surface. Public access to Kaula Island has been and is currently restricted at all times due to the possibility of UXO existing on the island; regular range clearance operations are not conducted on the range because physical access is limited due to difficult terrain and sea states around the island. In 1999, an archaeological survey was completed across all accessible terrain on Kaula Island (Robins & L. Anderson, 2001). Excluding the steep cliffs and eroding slopes encircling the island, and areas inaccessible due to high winds and ground surface instability, archaeologists surveyed approximately 36 acres or 50 percent of the accessible surface of the island. Six archaeological sites were recorded on Kaula Island. Five sites were recorded in the northern portion of the island; four were interpreted to be traditional Hawaiian sites, while one lacked sufficient integrity for cultural or functional interpretation. One site, a concrete lighthouse foundation, was recorded at the summit of the island between the northern and southern ends. No archaeological sites have been identified in the southern portion of the island within the training and testing area.

Also in 2001, the Navy followed the process outlined in National Register Bulletin 38 (National Park Service, 1998) to conduct a study to identify potential TCPs located on or in the vicinity of Kaula Island; the process included reviewing historical materials and researching published Hawaiian traditional texts. The subsequent TCP study was published in 2004 and noted that Kaula Island is associated with Native Hawaiian traditions related to the direction west; sunset; winter solstice; the deities Pele, Kuhaimoana, Kane, and Kanaloa; ali'i (chief, nobility); fishing; navigation; migration; wind; transition; and symbolic associations of life and death. The study also identified three potential TCPs: Kaula Island as a whole; Keanaoku, an underwater cave associated with the shark god Kuhaimoana; and Kahalauloa, the location of a heiau (sacred Hawaiian temple) (Tuggle & Dye, 2004). Both Keanaoku and Kahalauloa are located on the north side of the island.

Following the publication of the Draft EA in August 2024, the Navy received public comments regarding the religious and cultural significance of Kaula Island to Native Hawaiians and concerns about continued use of Kaula Island by the military for training and testing activities associated with the Proposed Action. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with cultural traditions and events in Hawaiian history, and association with the shark god Kuhaimoana; and NHOs recognize the island as a traditional place used by Native Hawaiians for

collecting natural resources, including bird feathers and stones used in traditional octopus lures. Additionally, comments indicated that cultural practices, such as navigation and subsistence fishing, are conducted in the vicinity of Kaula Island (see Appendix C, Agency Correspondence).

Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. Subsequently, the Navy determined that Kaula Island meets the criteria of a TCP eligible for listing in the NRHP. Three character-defining features were identified within the Kaula Island TCP: Kaula Island itself; the sea cave Keanaoku; and Kahalauloa, the location of a sacred Hawaiian temple (heiau). Kaula Island itself is associated with significant cultural traditions, practices, and events in Hawaiian history. The sea cave Keanaoku is considered to be home to the shark deity Kuhaimoana and is an important place to perform cultural protocols and practices. Heiau on the island, generally, are connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific.

3.6.5 Environmental Consequences

Analysis of potential impacts on cultural resources considers both direct and indirect impacts. Direct impacts may be the result of physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the importance of the resource, introducing visual, atmospheric, or audible elements that are out of character for the period the resource represents (thereby altering the setting); or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect effects may be the result of direct effects such as a physical damage to an architectural resource, with the indirect effect that people are no longer able to see or access that resource.

Under the Proposed Action, the types of training currently being conducted at PMRF would not change. A variety of measures are currently in place to protect and avoid effects on historic properties at Barking Sands during training and testing activities. Measures and stipulations in the 2012 PA have been incorporated into the PMRF ICRMP SOPs and installation BMPs listed in Table 3.6-2. The Proposed Action includes continued use of appropriate and relevant SOPs and measures that would avoid and minimize potential impacts on cultural resources. Avoidance of cultural resources was considered a priority in the design and placement of the training and testing areas. Relevant SOPs and minimization measures, established in existing Navy agreements and management plans, are discussed below for each training and testing activity (Table 3.6-3 through Table 3.6-13). Classifications of the scales of the exercises for the activities described can be found in Appendix A (Military Readiness Activities Descriptions).

Table 3.6-2: SOPs, BMPs, and Minimization Measures for Cultural Resources

Protection Focus	Measure
Pre-Training and Testing	
ICRMP SOPs	
Section 106 Compliance	• Navy cultural resources SMEs review undertaking(s), evaluate effects of the proposed undertaking, and complete NHPA Section 106 compliance as stipulated under the 2012 PA (ICRMP SOP#4).
Briefing of Personnel	• Navy SME conducts briefings to operational personnel for cultural resource sensitivities prior to training exercises (ICRMP SOP #8). o Range Users are informed that discovery (or damage) of cultural resources within training areas must be immediately reported, and activity must cease.

Protection Focus	Measure
Unanticipated Discoveries	• If unanticipated cultural resources are encountered, all activities will cease in the immediate vicinity of the find and reported to the Navy CRM. Subsequent SOPs that may be triggered: ○ Inadvertent discovery of Archaeological Remains (ICRMP SOP#9) ○ Inadvertent discovery of Human Remains (ICRMP SOP# 10) ▪ Consultation with NHOs is triggered if Native Hawaiian remains are encountered or suspected ▪ No photography or movement of osteological materials, secure area, and call Navy SME.
Fire Suppression	• Fire suppression communication (ICRMP SOP #14) ○ Navy CRM communicates with Navy SMEs regarding emergency management procedures.
On-site Monitoring	• Monitoring during construction and/or ground-disturbing activities (ICRMP SOP #8) ○ Navy SME carries out or oversees field checks prior to amphibious operations and other operations to ensure avoidance of historic properties.
Emergency Situations	• Emergency Situations (ICRMP SOP #14)
ARPA Compliance	• ARPA Compliance (ICRMP SOP#5) Removal of historical, cultural, or archeological objects is prohibited and punishable by law. • ARPA compliance is included in PMRF Site Approval Request dig permit process, where archaeology signature block is coordinated with other Navy SME review blocks. Navy Installation POCs review and sign off on dig permits prior to a proposed ground disturbing activity. • Digging or excavating is prohibited unless clearance obtained by Navy approvals (dig permit). • Range Users prioritize the use of sand bags for stabilization measures over excavations.
BMPs	
Avoidance of Known Historic Properties	• Navy cultural resources SMEs completes review prior to proposed action and avoidance of known historic properties is prioritized.
Approved Pathways	• Range Users are required to stay on designated pathways without deviation. • Vehicles are restricted to established roads, maintenance corridors, and approved roadways. No off-roading or driving on beaches without Navy approvals.
Cultural Resource Surveys	• Navy SME supports pre-exercise pedestrian survey relative to the proposed action.
Amphibious Landings	• Range Users lay down mats during amphibious operations. Mats are used in the area where small boats come ashore to prevent disturbance to resources in the sand. During small boat operations, a four-wheel drive pickup truck and trailer used to transport the small boats (Combat Rubber Raiding Craft) briefly traverse the mats to hardened landing area access road. • Prior to amphibious landings that may affect the sandy beaches, beaches will be surveyed prior to beach landing exercises. • Amphibious activities would only occur outside of the designated buffer zone. Any sensitive cultural resources within this area will be flagged and avoided.
Program Funding	• Annually, Navy CRM works to solicit CR funding to support compliance requirements and field staff.
Post Training and Testing	
ICRMP SOPs	
Cultural Resource Surveys	• Navy CR SME supports post-exercise survey of area, triggered by unexpected fires or mishap (SOP#14).

Protection Focus	Measure
Consultation Agreement Compliance	• The Navy SME completes Programmatic Agreement (PA) Memos for all activities that fall under the 2012 NRH PA. These memos are included in the NRH PA Annual Report per Section XII.
BMPs	
Annual Reporting	• Navy CR SME provides input for Annual Reporting requirements (2012 PA Section XII)
Field Checks	• Navy SME carries out field checks after amphibious operations and other operations to ensure avoidance of historic properties.
Cultural Resource Surveys	• Navy SME supports post-exercise pedestrian survey relative to the proposed action.
Reporting	• Follow-up reporting on unanticipated finds discovered during training activities
De-Briefing	• After action de-briefing for training activities and unanticipated incidents (i.e., Navy CR SME contributes to after action reports).
Archaeological Signage	• Navy has established signs that provide information on federally protected cultural resources and areas. • Cordoned off areas are marked to prevent unauthorized entry (keep out signage).
Mats	• Mats are utilized wherever possible for amphibious landings to limit ground disturbance.
Sand Bags	• Sand bags are prioritized for stabilization over excavations.

Notes: CRM = Cultural Resources Manager, SOP = Standard Operating Procedure, ICRMP = Integrated Cultural Resources Management Plan, SME = Subject Matter Expert, ARPA = Archaeological Resources Protection Act, NHPA = National Historic Preservation Act, CR = Cultural Resources, NRH = Navy Region Hawaii

3.6.5.1 No Action Alternative

Under the No Action Alternative, there would be no change from current levels of Navy-led training and testing activities and these activities would continue to occur within the same designated areas previously analyzed in relevant environmental documentation listed in Table 1.6-1. Impacts on cultural resources would remain as they do today and activities would continue under the same SOPs and minimization measures as presently conducted. Proposed increases in land-based training and testing activities would not occur, and there would be no change in designated training areas.

Even under the No Action Alternative, the Navy has determined that existing training activities on Kaula Island would have adverse effects on the island, which has been identified as a TCP eligible for the NRHP. Despite this, the Navy would continue its consultation efforts with NHOs, the OHA, the SHPD, and other consulting parties; and notified the ACHP, in an effort to resolve these adverse effects and develop a MOA. These measures would ensure that no significant impacts on cultural resources occur as a result of the No Action Alternative.

3.6.5.2 Proposed Action

3.6.5.2.1 Barking Sands

North Launch Area 1. North Launch Area 1 is an area that has been previously disturbed by landscaping and development. The entire area has been graded, and paved areas contain launch pads, a launcher, and communication facilities. Approximately 1.2 acres of the western portion of North Launch Area 1 extends into the boundary of Site 50-30-01-1860, known as Nohili Dune (see Section 3.6.4.1.1, Barking Sands). Most of the roughly 157-acre Nohili Dune site falls outside of the North Launch Area 1 training and testing site.

Proposed training and testing activities at North Launch Area 1 are listed in Table 3.6-3. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing

avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Missile, Rocket, and Aerial Target Drone Launch: Under the Proposed Action, the tempo of Missile, Rocket, and Aerial Target Drone Launch activities would decrease from 16 to 15 annual activities at North Launch Area 1. Per ongoing activities, ground disturbance may include equipment stabilizing systems and grounding rods (Table 3.6-3). Missile, rocket, and aerial target drone launch activities produce noise and vibrations. However, noise events associated with these activities are intermittent and brief (5–10 seconds), resulting in relatively small increases in overall noise levels. While launch noise results in higher than typical ambient levels, it is comparable to a large truck passing by on the road or airplane overflight. Noise and vibration from ongoing launch activities are not intense enough to physically impact or alter the setting of the existing Nohili Dune site. Under the Proposed Action, given the decrease in tempo of launches, no changes in baseline conditions would be expected to occur on the Nohili Dune site because training and testing activities would continue to avoid the site per existing SOPs; proposed training activities would remain on existing pavements or launch pad infrastructure and no ground disturbance would be anticipated.

Missile, Rocket, and Aerial Target Drone Target Set-Up (No Launch): Under the Proposed Action, the tempo of Missile, Rocket, and Aerial Target Drone Target set-up activities would increase to up to six annual activities at North Launch Area 1. Types of potential ground disturbance associated with this activity include equipment stabilizing systems and grounding rods (Table 3.6-3). While there is a proposed increase in this activity, potential ground disturbance would not impact the Nohili Dune site because the site would continue to be avoided per existing SOPs.

C5ISRT: Under the Proposed Action, the tempo of C5ISRT activities would increase to up to 30 annual activities at North Launch Area 1. Types of potential ground disturbance associated with C5ISRT activities include setting grounding rods and tent stakes (Table 3.6-3). While there is a proposed increase in this activity, potential ground disturbance would not impact the Nohili Dune site because the site would continue to be avoided per existing SOPs.

In summary, all proposed activities at North Launch Area 1 would occur on previously disturbed ground that is either hardscape or graded. Proposed activities would be conducted within the existing infrastructure and developed area of North Launch Area 1 and would avoid the Nohili Dune TCP. Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Command. Although the increase in the tempo of activities associated with the Proposed Action could lessen schedule availability, PMRF installation personnel would continue to provide Native Hawaiians with access to the Nohili Dune TCP at North Launch Area 1 in accordance with the American Indian Religious Freedom Act and EO 13007, on a case-by-case basis.

North Launch Area 2. North Launch Area 2 is an area that has been previously disturbed. The entire area has been graded, and paved areas contain launch pads, a launcher, and command and communication facilities. No historic properties have been identified within the training and testing site. Proposed training and testing activities at North Launch Area 2 are listed in Table 3.6-4.

Missile, Rocket, and Aerial Target Drone Launch: Under the Proposed Action, the tempo of Missile, Rocket, and Aerial Target Drone Launch activities would increase to up to 20 annual activities at North Launch Area 2. Types of potential ground disturbance associated with this activity include equipment stabilizing systems and grounding rods (Table 3.6-4).

Table 3.6-3: Proposed Training and Testing Activities at North Launch Area 1

Activity	Activity Description	Potential for Impacts	Avoidance and Protection Measures
Missile, Rocket, and Aerial Target Drone Launch	Terrestrial component of launching missiles, rockets, and aerial target drones from established launch areas ashore. Aerial or surface target intercepts to occur offshore, on or above water. This activity is conducted within current existing, launch areas that are graded and include supporting infrastructure. Launches are oriented such that the missile, rocket, or aerial target drone head directly toward the open ocean, all within PMRF's restricted airspace. Various fixed or mobile systems and platforms may be used.	• For some mobile systems, the stabilizing system requires ground disturbance in small areas. Hand excavations with shovels are used to dig up to 18 inches deep. • Grounding rods (5/8 inch in diameter and 3–6 feet long) needed for up to 3 generators.	• All proposed activities would occur on previously disturbed ground (graded or hardscape). • Proposed activities would be conducted within existing infrastructure and developed area of North Launch Area 1. • No excavation or ground disturbance would take place within the Nohili Dune TCP (Site 50-30-05-1860).
Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Conduct non-live-fire missile or rocket system launch preparation by deploying, making ready for launch, and redeploying a transportable tactical missile or rocket system.	• For some mobile systems, the stabilizing system requires ground disturbance in small areas. Hand excavations with shovels are used to dig up to 18 inches deep. • Grounding rods (5/8 inch in diameter and 3–6 feet long) needed for up to 3 generators.	• All proposed activities would occur on previously disturbed ground (graded or hardscape). • Proposed activities would be conducted within existing infrastructure and developed area of North Launch Area 1. • No excavation or ground disturbance would take place within the Nohili Dune TCP (Site 50-30-05-1860).
C5ISRT	Establish and operate a tactical field command post, communication systems, radar tracking and surveillance systems, optical tracking systems, and electronic warfare equipment. May use existing facilities or mobile, vehicle-based systems.	• Equipment stabilization using stakes measuring not more than 45 cm long (18 in) and 1.6 cm (5/8 in) in diameter. • Grounding rods (5/8 inch in diameter) associated with generators, sensors, and other equipment; ground disturbance could vary between 3 and 6 feet deep per rod.	• All proposed activities would occur on previously disturbed ground (graded or hardscape). • Proposed activities would be conducted within existing infrastructure and developed area of North Launch Area 1. • No excavation or ground disturbance would take place within the Nohili Dune TCP (Site 50-30-05-1860).

Table 3.6-4: Proposed Training and Testing Activities at North Launch Area 2

Proposed Activity	Activity Description	Potential for Impacts	Avoidance and Protection Measures
Missile, Rocket, and Aerial Target Drone Launch	Terrestrial component of launching missiles, rockets, and aerial target drones from established launch areas ashore. Aerial or surface target intercepts to occur offshore, on or above water. This activity is conducted within current existing, launch areas that are graded and include supporting infrastructure. Launches are oriented such that the missile, rocket, or aerial target drone head directly toward the open ocean, all within PMRF's restricted airspace. Various fixed or mobile systems and platforms may be used.	• For some mobile systems, the stabilizing system requires ground disturbance in small areas. Hand excavations with shovels are used to dig up to 18 inches deep. • Grounding rods (5/8 inch in diameter and 3–6 feet long) needed for up to 3 generators.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Conduct non-live-fire missile or rocket system launch preparation by deploying, making ready for launch, and redeploying a transportable tactical missile or rocket system.	• For some mobile systems, the stabilizing system requires ground disturbance in small areas. Hand excavations with shovels are used to dig up to 18 inches deep. • Grounding rods (5/8 inch in diameter and 3–6 feet long) needed for up to 3 generators.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
Artillery	Terrestrial component of land-based forces live firing of artillery guns at surface (waterborne) or air targets. Artillery guns oriented such that artillery round heads directly toward the open ocean, all within PMRF's restricted airspace. A typical artillery system is	• The M777 stabilizing system (using shovels) requires ground disturbance to a depth of approximately 18 inches.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Proposed Activity	Activity Description	Potential for Impacts	Avoidance and Protection Measures
	the M777 Howitzer, a mobile live-fire system that fires 155-millimeter (mm) rounds. Other artillery systems fire smaller 105 mm rounds.		
C5ISRT	Establish and operate a tactical field command post, communication systems, radar tracking and surveillance systems, optical tracking systems, and electronic warfare equipment. May use existing facilities or mobile, vehicle-based systems.	• Equipment stabilization using stakes measuring not more than 45 cm long (18 in) and 1.6 cm (5/8 in) in diameter. • Grounding rods (5/8 inch in diameter) associated with generators, sensors, and other equipment; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
Bivouacking	Establish and operate expeditionary field lodging for personnel conducting training.	• Placement of tent stakes (18-inch length, 5/8-inch diameter) for up to 20-person shelters. • Grounding rods (5/8 inch in diameter) associated with up to 2 generators; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Missile, Rocket, and Aerial Target Drone Target Set-Up (No Launch): Under the Proposed Action, the tempo of missile, rocket, and aerial target drone target set-up activities would increase to up to six annual activities at North Launch Area 2. The types of potential ground disturbance associated with this activity include equipment stabilizing systems and grounding rods (Table 3.6-4).

Artillery: Under the Proposed Action, the tempo of artillery activities would increase to up to three annual activities at North Launch Area 2. The only type of potential ground disturbance associated with this activity is the use of the M777 stabilization system (Table 3.6-4).

C5ISRT: Under the Proposed Action the tempo of C5ISRT activities would increase to up to 12 annual activities at North Launch Area 2. Types of potential ground disturbance associated with C5ISRT activities include setting grounding rods and tent stakes (Table 3.6-4).

Bivouacking: Under the Proposed Action, the tempo of Bivouacking activities would increase to up to nine annual activities at North Launch Area 2. Types of potential ground disturbance associated with bivouacking activities include setting grounding rods and tent stakes (Table 3.6-4).

In summary, all training and testing activities at North Launch Area 2 would occur on previously disturbed ground that is either hardscape or graded. No historic properties have been identified within the North Launch Area 2 training and testing site.

South Launch Area. South Launch Area, which includes the Golf Range CDZ, is an area that is previously disturbed by grading and development. The entire area has been graded and paved areas include a single launch facility. No historic properties have been identified within the training and test site.

Proposed activities at South Launch are listed in Table 3.6-5 and summarized below. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Missile, Rocket, and Aerial Target Drone Target Set-Up (No Launch): Under the Proposed Action, the tempo of missile, rocket, and aerial target drone target set-up activities would increase to up to six annual activities at South Launch Area. The types of potential ground disturbance associated with this activity include equipment stabilizing systems and grounding rods (Table 3.6-5).

Parachute Operations: Under the Proposed Action, the tempo of parachute operations conducted at Golf Range CDZ within the South Launch Area would increase to up to 16 annual activities. No ground disturbance is associated with these activities (Table 3.6-5). Parachute operations at Golf Range CDZ are only conducted on previously disturbed, hard surface areas and would continue to be conducted within the CDZ in a manner that does not result in ground disturbance.

C5ISRT: Under the Proposed Action, the tempo of C5ISRT activities would increase to up to 18 annual activities at South Launch Area. Types of potential ground disturbance associated with C5ISRT activities include setting tent stakes and grounding rods (Table 3.6-5).

In summary, all proposed activities at the South Launch Area would occur on previously disturbed ground that has been graded. No historic properties have been identified within the South Launch Area training and testing site.

Table 3.6-5: Proposed Training and Testing Activities at South Launch Area

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Conduct non-live-fire missile or rocket system launch preparation by deploying, making ready for launch, and redeploying a transportable tactical missile or rocket system.	• For some mobile systems, the stabilizing system requires ground disturbance in small areas. Hand excavations with shovels are used to dig up to 18 inches deep. • Grounding rods (5/8 inch in diameter and 3-6 feet long). needed for up to 3 generators.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
Parachute Operations	Conduct parachute operations (terrestrial landings).	• No ground disturbance is associated with pedestrian or equipment contact.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
C5ISRT	Establish and operate a tactical field command post, communication systems, radar tracking and surveillance systems, optical tracking systems, and electronic warfare equipment. May use existing facilities or mobile, vehicle-based systems.	• Equipment stabilization using stakes measuring not more than 45 cm long (18 in) and 1.6 cm (5/8 in) in diameter. • Grounding rods (5/8 inch in diameter) associated with generators, sensors, and other equipment; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Palai Olani Area. Palai Olani is an area that has been previously disturbed from previous military use, hydrophone trenching, and constant wind and tidal action. The area includes Divers Landing, Over the Beach Landing, Bunker CDZ, Kukui CDZ, and Fire Pit LZ. Approximately 1.4 acres of the Palai Olani study area overlaps with the boundary of Site 50-30-05-2035 (0.1 acres of Divers Landing, 0.2 acres of Over-the-Beach Landing, and 1.1 acres of Bunker CDZ); the majority of the 6.4-acre site falls outside of the training and testing area. The entire 1.1-acre Site 50-30-05-2040 falls within the Palai Olani study area.

Proposed training and testing activities at Palai Olani are listed in Table 3.6-6. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Small Boat Operations: Under the Proposed Action, the tempo of small boat operations would increase to up to 19 annual activities at Over-the-Beach Landing. Types of potential ground disturbance and minimization measures associated with small boat operations include vehicle and personnel movement over the beach (Table 3.6-6). Under the Proposed Action, mats would be laid down in the area where the small boats would come ashore to prevent disturbance to resources in the sand. A four-wheel drive pickup truck and trailer used to transport the small boats (Combat Rubber Raiding Craft) would briefly traverse over the sand while traveling across the mats to the hardened landing area access road. Vehicle movement would not cause significant sand displacement and would occur in areas that are previously

disturbed. While there is a proposed increase in this activity, potential ground disturbance would not impact Site 50-30-05-2035 because the site would continue to be avoided per existing SOPs.

Swimmer Insertion and Extraction: Under the Proposed Action, the tempo of swimmer insertion and extraction activities would increase to up to two annual activities at Divers Landing and Over-the-Beach Landing. The only type of potential ground disturbance for swimmer insertion and extraction activities is personnel movement over the beach (Table 3.6-6). Swimmer insertion and extraction activities would be conducted on foot and within previously disturbed areas. While there is a proposed increase in this activity, potential ground disturbance would not impact Site 50-30-05-2035 because the site would continue to be avoided per existing SOPs.

Table 3.6-6: Proposed Training and Testing Activities at Palai Olani

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
Amphibious Small Boat Operations	A Unit using small boats move from offshore location to a beach-landing site. Forces manually carry boats to an inland site, conduct reconnaissance, and then return to the sea via small boats.	• Vehicle and personnel movement.	• All proposed activities at Palai Olani would be conducted on previously disturbed land or in active coastal zone. • No excavations would take place within historic properties (50-30-05-2035 and 50-30-05-2040). • Personnel use mats to protect against ground disturbance during training activities that include vehicle movement in the active coastal zone • Personnel use established pathways when transporting small boats and moving from the active coastal zone to the hinterland. • Pedestrian movements associated with follow-on activities do not include dune areas. • Vehicles do not operate in dune areas.
Amphibious Swimmer Insertion and Extraction	Swimmer Insertion/Extraction. Personnel conduct over-the-beach water entry swimmer insertion and	• Pedestrian movements associated with follow-on activities.	• All proposed activities at Palai Olani would be conducted on previously disturbed land or in active coastal zone.

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
	extraction training in Barking Sands' amphibious landing areas.		• No excavations would take place within historic properties (50-30-05-2035 and 50-30-05-2040). • Pedestrian movements associated with follow-on activities do not include dune areas.
Parachute Operations	Conduct parachute operations (terrestrial landings).	• No ground disturbance is associated with pedestrian or equipment contact.	• All proposed activities at Palai Olani would be conducted on previously disturbed land or in active coastal zone. • No excavations would take place within historic properties (50-30-05-2035 and 50-30-05-2040). • Pedestrian movements associated with follow-on activities do not include dune areas.
Helicopter/Tilt-Rotor LZ Operations	Helicopter/Tilt-Rotor aircraft conduct LZ Operations (off airport surface). Deliver/recover personnel or equipment from/to unimproved landing zone locations.	• Ground disturbance may result from rotor downwash.	• All proposed activities at Palai Olani would be conducted on previously disturbed land or in active coastal zone. • No excavations would take place within historic properties (50-30-05-2035 and 50-30-05-2040). • Pedestrian movements associated with follow-on activities do not include dune areas. • Watering down the landing zone prior to LZ operations to minimize disturbance resulting from rotor wash.
Bivouacking	Establish and operate expeditionary field lodging for personnel conducting training.	• Placement of tent stakes (18-inch length, 5/8-inch diameter) for	• All proposed activities at Palai Olani would be conducted on previously

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
		up to 20-person shelters. • Grounding rods (5/8 inch in diameter) associated with up to 2 generators; ground disturbance could vary between 3 and 6 feet deep per rod.	disturbed land or in active coastal zone. • No excavations would take place within historic properties (50-30-05-2035 and 50-30-05-2040). • Pedestrian movements associated with follow-on activities do not include dune areas.

Parachute Operations: Under the Proposed Action, the tempo of parachute operations would increase to up to 16 annual activities at Bunker CDZ and Kukui CDZ. No potential ground disturbance is associated with these activities (Table 3.6-6). Parachute operations at Bunker CDZ and Kukui CDZ are only conducted on previously disturbed, hard-surface areas and would continue to be conducted within the CDZs in a manner that does not result in ground disturbance. Parachute operations would continue to avoid Site 50-30-05-2035.

Helicopter or Tilt-Rotor Landing Zone Operations: Under the Proposed Action, the tempo of helicopter or tilt-rotor landing zone operations would increase to up to 12 annual activities at Fire Pit LZ. The only type of potential ground disturbance associated with this activity is rotor wash (Table 3.6-6). Fire Pit Landing Zone is located in a previously disturbed area where no historic properties have been identified. However, site 50-30-05-2040 is located immediately adjacent to the boundary of Fire Pit Landing Zone within Palai Olani and could potentially be disturbed by rotor wash. During helicopter or tilt-rotor landings, however, the landing zone is watered down to reduce erosion from rotor wash. Additional minimization measures are described in Table 3.6-6. While there is a proposed increase in this activity, potential ground disturbance would not impact Site 50-30-05-2040 because the site would continue to be avoided per existing SOPs.

Bivouacking: Under the Proposed Action, the tempo of bivouacking activities would increase to up to six annual activities at Palai Olani. Types of potential ground disturbance associated with this activity include setting tent stakes and grounding rods (Table 3.6-6). Bivouacking would only occur in previously disturbed areas and would not occur on the beach or the dune areas. While there is a proposed increase in this activity, potential ground disturbance would not impact Sites 50-30-05-2035 or 50-30-05-2040 because the site would continue to be avoided per existing SOPs.

In summary, all proposed activities at Palai Olani would be conducted on previously disturbed land and would avoid known historic properties (50-30-05-2035 and 50-30-05-2040). Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Command. Although the increase in the tempo of activities associated with the Proposed Action could lessen schedule availability, PMRF installation personnel would continue to provide Native Hawaiians with access to the historic properties in accordance with the American Indian Religious Freedom Act and EO 13007, on a case-by-case basis.

Waiapuaa Bay. Waiapuaa Bay is an area that has been previously disturbed from past military activity, public use, and constant wind and tidal action. No historic properties have been identified in the Waiapuaa Bay Amphibious Landing Area. Two historic properties, 50-30-05-4016 (0.01 acre) and 50-30-05-2272 (0.04 acres), fall entirely within the Waiapuaa Bay Amphibious Staging Area, which is located in the back beach (Table 3.6-1).

Proposed training and testing activities at Waiapuaa Bay are listed in Table 3.6-7. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Amphibious Raid: Under the Proposed Action, the tempo of amphibious raid activities would increase to up to two annual activities at Waiapuaa Bay. Types of ground disturbance associated with this activity include vehicle and personnel movement over the beach (Table 3.6-7). Under the Proposed Action, mats would be laid down in the area where the amphibious crafts would come ashore to prevent disturbance to resources in the sand. Vehicles used during amphibious raids (e.g., JLTVs, ACVs) would briefly traverse over the sand while traveling across the mats to the hardened landing area access road. Activities would be restricted to utilizing the existing corridor, which supports installation infrastructure and maintenance operations.

No historic properties have been identified in the Waiapuaa Bay Amphibious Landing Area or access road. Two historic properties have been identified in the Waiapuaa Bay Amphibious Staging Area. While there is a proposed increase in amphibious raid activities, potential ground disturbance would not impact Sites 50-30-05-4016 or 50-30-05-2272 because the sites would continue to be avoided per existing SOPs.

Small Boat Operations: Under the Proposed Action, the tempo of small boat operations would increase to up to 19 annual activities at Waiapuaa Bay. Types of potential ground disturbance associated with small boat operations include vehicle and personnel movement over the beach (Table 3.6-7). Under the Proposed Action, mats would be laid down in the area where the small boats would come ashore to prevent disturbance to resources in the sand. During small boat operations, a four-wheel drive pickup truck and trailer used to transport the small boats (Combat Rubber Raiding Craft) would briefly traverse over the sand while traveling across the mats to the hardened landing area access road. However, activities would be restricted to utilizing the existing corridor, which supports installation infrastructure and maintenance operations; training activities would continue to be conducted in a manner that avoids historic properties.

No historic properties have been identified in the Waiapuaa Bay Amphibious Landing Area or access road; two historic properties have been identified in the Waiapuaa Bay Amphibious Staging Area. While there is a proposed increase in small boat operations, potential ground disturbance would not impact Sites 50-30-05-4016 or 50-30-05-2272 because the sites would continue to be avoided.

Table 3.6-7: Proposed Training and Testing Activities at Waiapuaa Bay

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
Amphibious Raid	Company (unit-sized) forces move from amphibious ships at sea, conduct	• Vehicles and personnel movement.	• All proposed activities at Waiapuaa Bay would be conducted on

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
	amphibious landing via various vessels/watercraft/vehicles, and conduct follow-on activities ashore. Return to amphibious ships at sea.		previously disturbed land or in the active coastal zone. • No historic properties have been identified in the amphibious landing area where the majority of proposed activities would take place. • Two historic properties (50-30-05-4016 and 50-30-05-2272), located in the back beach amphibious staging area, would be entirely avoided. • Vehicle movement on the beach during amphibious operations is in the active coastal zone, and mats are used in the area to prevent disturbance to potential resources in the sand. • Personnel use established pathways when carrying small boats and moving from the active coastal zone to the hinterland. • Pedestrian movements associated with follow-on activities do not include dune areas.
Amphibious Small Boat Operations	A Unit using small boats move from offshore location to a beach-landing site. Forces manually carry boats to an inland site, conduct reconnaissance, and then return to the sea via small boats.	• Vehicles and personnel Movement.	• All proposed activities at Waiapuaa Bay would be conducted on previously disturbed land or in the active coastal zone. • No historic properties have been identified in the amphibious landing area where the

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
			majority of proposed activities would take place. • Two historic properties (50-30-05-4016 and 50-30-05-2272), located in the back beach amphibious staging area, would be entirely avoided. • Vehicle movement on the beach during amphibious operations is in the active coastal zone, and mats are used in the area to prevent disturbance to potential resources in the sand. • Personnel use established pathways when carrying small boats and moving from the active coastal zone to the hinterland. • Pedestrian movements associated with follow-on activities do not include dune areas.
Amphibious Swimmer Insertion and Extraction	Swimmer Insertion/Extraction. Personnel conduct over-the-beach water entry swimmer insertion and extraction training in Barking Sands' amphibious landing areas.	• Vehicles and personnel movement	• All proposed activities at Waiapuaa Bay would be conducted on previously disturbed land or in the active coastal zone. • No historic properties have been identified in the amphibious landing area where the majority of proposed activities would take place. • Two historic properties (50-30-05-4016 and 50-30-05-2272), located in the back beach

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
			amphibious staging area, would be entirely avoided. • Personnel use established pathways when carrying small boats and moving from the active coastal zone to the hinterland. • Pedestrian movements associated with follow-on activities do not include dune areas.

Swimmer Insertion and Extraction currently occurs at Waiapuaa Bay in heavily disturbed areas. Under the Proposed Action, the tempo of swimmer insertion and extraction activities would increase to up to two annual activities at Waiapuaa Bay. The only type of potential ground disturbance associated with this activity is personnel movement over the beach (Table 3.6-7). Swimmer insertion and extraction activities would be restricted to utilizing the existing corridor, which supports installation infrastructure and maintenance operations. While there is a proposed increase in swimmer insertion and extraction activities, potential ground disturbance would not impact Sites 50-30-05-4016 or 50-30-05-2272 because the sites would continue to be avoided per existing SOPs.

In summary, all proposed activities at Waiapuaa Bay would be conducted on previously disturbed land. No historic properties have been identified in the Waiapuaa Bay Amphibious Landing Area where the majority of proposed activities would take place. Two historic properties (Sites 50-30-05-4016 and 50-30-05-2272), located in the Waiapuaa Bay Amphibious Staging Area, would be avoided. Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Command. Although the increase in the tempo of activities associated with the Proposed Action could lessen schedule availability, PMRF installation personnel would continue to provide Native Hawaiians with access to the historic properties in accordance with the American Indian Religious Freedom Act and EO 13007, on a case-by-case basis.

MDA Hard Stand. MDA Hard Stand is in an area that has been previously disturbed by landscaping and development. Developed areas support radar testing. No historic properties have been identified within the training and testing site.

Proposed training and testing activities at MDA Hard Stand are listed in Table 3.6-8. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

C5ISRT: Under the Proposed Action, the tempo of C5ISRT activities would increase to up to 10 annual activities at MDA Hard Stand. Types of potential ground disturbance associated with C5ISRT activities include setting tent stakes and grounding rods (Table 3.6-8).

Bivouacking: Under the Proposed Action, the tempo of bivouacking activities would increase to up to four annual activities under the Proposed Action. Types of potential ground disturbance associated with bivouacking activities include setting tent stakes and grounding rods (Table 3.6-8).

In summary, C5ISRT and Bivouacking at MDA Hard Stand would be conducted on previously disturbed or hardscaped land, and no cultural resources have been identified within the MDA Hard Stand training and testing site.

Table 3.6-8: Proposed Training and Testing Activities at MDA Hard Stand

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
C5ISRT	Establish and operate a tactical field command post, communication systems, radar tracking and surveillance systems, optical tracking systems, and electronic warfare equipment. May use existing facilities or mobile, vehicle-based systems.	• Equipment stabilization using stakes measuring not more than 45 cm long (18 in) and 1.6 cm (5/8 in) in diameter. • Grounding rods (5/8 inch in diameter) associated with generators, sensors, and other equipment; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
Bivouacking	Establish and operate expeditionary field lodging for personnel conducting training.	• Placement of tent stakes (18-inch length, 5/8-inch diameter) for up to 20-person shelters. • Grounding rods (5/8 inch in diameter) associated with up to 2 generators; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Airfield Bivouac Area. Airfield Bivouac Area is in an area that has been previously disturbed by landscaping and development. The site supports several logistics buildings. No historic properties have been identified within the training and testing site.

Proposed activities at the Airfield Bivouac Area are listed in Table 3.6-9. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Bivouacking: Under the Proposed Action, the tempo of bivouacking activities would increase to up to 26 annual activities at Airfield Bivouac Area. Types of potential ground disturbance associated with bivouacking activities include setting tent stakes and grounding rods (Table 3.6-9).

In summary, bivouacking activities at Airfield Bivouac Area would continue to be conducted on previously disturbed or hardscaped land, and no cultural resources have been recorded within the training and testing site.

Table 3.6-9: Proposed Training and Testing Activities at Airfield Bivouac Area

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protective Measures
Bivouacking	Establish and operate expeditionary field lodging for personnel conducting training.	• Placement of tent stakes (18-inch length, 5/8-inch diameter) for up to 20-person shelters. • Grounding rods (5/8 inch in diameter) associated with up to 2 generators; ground disturbance could vary between 3 and 6 feet deep per rod.	• No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Alternate Bivouac Area. The Alternate Bivouac Area is an area that has been previously disturbed by grading. No historic properties have been identified within the training and test site.

Proposed activities at the Alternate Bivouac Area are listed in Table 3.6-10. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Parachute Operations: Under the Proposed Action, the tempo of parachute operations would increase to up to 16 annual activities at Alternate Bivouac Area. No potential ground disturbance is associated with this activity (Table 3.6-10). Parachute operations at ARDEL CDZ are only conducted on previously disturbed, hard surface areas and would continue to be conducted within the CDZ in a manner that does not result in ground disturbance.

Bivouacking: Under the Proposed Action, the tempo of bivouacking activities would increase to up to 2 annual activities at Alternate Bivouac Area. Types of potential ground disturbance associated with bivouacking activities include setting tent stakes and grounding rods (Table 3.6-10).

In summary, parachute operations and bivouacking activities at Alternate Bivouac Area would only be conducted on previously disturbed or hardscaped land. No cultural resources have been recorded within the training and testing site.

Table 3.6-10: Proposed Training and Testing Activities at the Alternate Bivouac Area

Proposed Activity	Activity Description	Associated Ground Disturbance	Existing Minimization/SOPs from ICRMP
Parachute Operations	Conduct parachute operations (terrestrial landings).	• No ground disturbance is associated with pedestrian or equipment contact.	No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).
Bivouacking	Establish and operate expeditionary field lodging for personnel conducting training.	• Placement of tent stakes (18-inch length, 5/8-inch diameter) for up to 20-person shelters.	No historic properties have been identified in this training and testing site. All proposed activities would occur on

Proposed Activity	Activity Description	Associated Ground Disturbance	Existing Minimization/SOPs from ICRMP
		• Grounding rods (5/8 inch in diameter) associated with up to 2 generators; ground disturbance could vary between 3 and 6 feet deep per rod.	previously disturbed ground (hardscape or graded).

FARP Areas. FARP Areas are located on the PMRF airfield and are previously disturbed from the development and operation of the airfield. No historic properties have been identified within the training and testing site.

Proposed activities that would occur at FARP Areas are listed in Table 3.6-11. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

FARP Operations: Under the Proposed Action, the tempo of FARP operations would increase to up to 20 annual activities within FARP Areas. The only type of potential ground disturbance associated with FARP operations is setting grounding rods (Table 3.6-11).

In summary, FARP operations at the FARP Areas would be conducted on previously disturbed or hardscaped land on or adjacent to the PMRF airfield. No cultural resources have been identified within the training and testing site.

Table 3.6-11: Proposed Training and Testing Activities at the FARP Areas

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protective Measures
Forward Arming and Refueling Point (FARP) Operations	Establish, operate, and re-deploy a FARP site using the Tactical Airfield Fuel Dispensing Systems, Helicopter Expedient Refueling System, or similar type expeditionary aircraft refueling system.	Existing grounding points are present throughout the airfield to ensure electrical continuity and reduce fire risk. Should a new placement or replacement of a grounding point be necessary, grounding rods (5/8 inch in diameter) associated with up to one generator would need to be placed; ground disturbance could vary between 3 and 6 feet deep per rod.	No historic properties have been identified in this training and testing site. All proposed activities would occur on previously disturbed ground (hardscape or graded).

Unmanned Aircraft System (UAS) Launch Area. The UAS Launch Area is an area that has been previously disturbed from the development and operation of the PMRF airfield. No historic properties have been identified within the training and testing site.

Proposed activities at UAS Launch are listed in Table 3.6-12 and summarized below. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Small Unmanned Aircraft Systems (sUAS) and Counter-UAS Operations: Under the Proposed Action, the tempo of sUAS and UAS operations would increase to up to 45 annual activities at the UAS Launch Area. Types of potential ground disturbance associated with sUAS and UAS launch operations include setting tent stakes and grounding rods (Table 3.6-12).

sUAS and UAS operations activities at the UAS Launch Area would be conducted on previously disturbed or hardscaped land on or adjacent to the PMRF airfield. No historic properties have been identified within the UAS Launch Area.

Table 3.6-12: Proposed Training and Testing Activities at the UAS Launch Area

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protective Measures
Small Unmanned Aircraft Systems (sUAS) and Counter-Unmanned Aircraft Systems (UAS) Operations	• Conduct sUAS operations. Launch and control sUAS. • Conduct counter-UAS operations. Launch and control a counter-UAS system from a terrestrial location.	• Existing grounding points are present throughout the airfield to ensure electrical continuity and reduce fire risk. Should a new placement or replacement of a grounding point be necessary, grounding rods (5/8 inch in diameter) associated with up to one generator would need to be placed; ground disturbance could vary between 3 and 6 feet deep per rod. • Placement of tent stakes (18-inch length, 5/8-inch diameter) associated with the catch net system.	No historic properties have been identified in these areas. All proposed activities would occur on previously disturbed ground (hardscape or graded).

3.6.5.2.2 Kaula Island

Part of Kaula Island, particularly the inert ordnance impact area on the southern end of the island, is previously disturbed from ongoing military training operations. No archaeological sites have been identified in Kaula Island's inert ordnance impact area used for training and testing. However, after the Draft EA's August 2024 publication, the Navy determined Kaula Island as a whole qualifies as a TCP eligible for the NRHP due to its association with significant cultural traditions, practices, and events in Hawaiian history (see Appendix C, Agency Correspondence).

Proposed activities at Kaula Island are listed in Table 3.6-13. In addition, the table presents activities with the potential for impacts via ground disturbance as well as existing avoidance and protection measures. Additional detail on proposed training and testing activities are provided in Appendix A (Military Readiness Activity Descriptions).

Air-to-Ground GUNEX: Under the Proposed Action, the tempo of GUNEX activities would increase to up to 24 annual activities at Kaula Island. Potential ground disturbance associated with GUNEX activities are

projectile impacts (Table 3.6-13). GUNEX activities would continue to only occur in the heavily disturbed inert ordnance impact area on the southern 1,000 feet tip of the island (see Figure 2.1-12).

Air-to-Ground BOMBEX: Under the Proposed Action, the tempo of BOMBEX activities using inert (non-explosive) munitions would increase to up to 31 annual activities at Kaula Island. The only type of potential ground disturbance associated with BOMBEX activities are bomb impacts (Table 3.6-13). BOMBEX activities and associated bomb impacts would continue to only occur in the heavily disturbed inert ordnance impact area on the southern 1,000 feet tip of the island (see Figure 2.1-12). In summary, GUNEX and BOMBEX activities at Kaula Island would only occur on the previously disturbed inert ordnance impact area, where no archaeological sites have been identified.

In accordance with Section IX of the 2012 PA, the Navy determined the proposed undertaking would adversely affect the Kaula Island TCP. This adverse effect stems from (1) introducing visual and atmospheric elements that diminish the integrity of its setting and feeling, and (2) limitations to NHO access. Potential effects on the sea cave and heiau are avoided as these features are on the island's northern side, well outside the proposed training area, and no new areas or types of training activities are included in the proposed undertaking.

Table 3.6-13: Proposed Training and Testing Activities at Kaula Island

Proposed Activity	Activity Description	Potential for Impact	Avoidance and Protection Measures
Air-to-Ground Gunnery Exercise (GUNEX)	GUNEX involves strike fighter aircraft and helicopter crews employing inert (non-explosive) gun ammunition only, in day or night conditions, and may include the use of targeting laser.	Ground disturbance results from inert projectile penetration.	All proposed activities would occur in the southern inert ordnance impact area, where no archaeological sites have been identified. All proposed activities would occur on previously disturbed ground and would be conducted in accordance with a MOA executed in consultations under the 2012 PA.
Air-to-Ground Bombing Exercise (BOMBEX)	BOMBEX involves training of strike fighter aircraft delivery of inert ordnance only against land targets in day or night conditions and may include the use of targeting laser.	Ground disturbance results from pressure-driven ground stress as bombs used during training and testing in this location are non-explosive (inert) material.	All proposed activities would occur in the southern inert ordnance impact area, where no archaeological sites have been identified. All proposed activities would occur on previously disturbed ground and would be conducted in accordance with a MOA executed in consultations under the 2012 PA.

3.6.5.2.3 Conclusion

Under the Proposed Action, all activities would be conducted in installation-designated areas that have been previously disturbed from ongoing military use, development, or element exposure. Proposed activities would continue to be conducted in a manner that avoids or minimizes impacts on historic properties. In the unlikely event cultural materials are discovered during training and testing activities, all activities in the immediate vicinity would be halted, and the PMRF Cultural Resources Manager and Range Point of Contact would be contacted to implement appropriate notification and SOPs.

Hawaiian traditional cultural practices on PMRF would continue to be managed in accordance with the SOPs described in Public Health and Safety (Table 3.4-1) and Cultural Resources (Table 3.6-2). Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Command. Although increases in the tempo of activities associated with the Proposed Action could lessen schedule availability, PMRF installation personnel would continue to provide Native Hawaiians with access to the historic properties in accordance with the American Indian Religious Freedom Act and EO 13007, on a case-by-case basis. Additionally, the MWR (Morale, Welfare and Recreation) Guest Card Program, which allows civilians to travel and access to Waiapuaa Bay and beach areas via the Barking Sands main gate, would be maintained.

To minimize health and safety risks, a Danger Zone surrounding Kaula Island was established for the primary purpose of ensuring an adequate margin of safety to both personnel and equipment during inert bombing and gunnery training operations by the military. The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard on revising the Danger Zone so that the waters within a 3 NM radius of Kaula Island would be open for cultural practices such as navigation and subsistence fishing, with the exception of when training events are being conducted (see Section 3.4, Public Health and Safety, for details on the closure notification process). The Navy is exploring how the public would be notified if the danger zone were to be accessible to the public outside of training event closures.

The Navy is fulfilling NHPA Section 106 requirements for this undertaking in accordance with the 2012 PA. Proposed activities would continue to be conducted in a manner that avoids or minimizes impacts on historic properties and in accordance with the 2012 PA. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the ACHP, in an effort to resolve adverse effects on the Kaula Island TCP and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6.

Cultural resources compliance at PMRF, to include resolution of adverse effects, shall be in accordance with the 2012 PA and all applicable ICRMP SOPs, and BMPs (Tables 3.6-2 through 3.6-14). Avoidance or minimization measures in established SOPs and BMPs would continue to be implemented to ensure that there would be no adverse effect on historic properties. All training and testing activities that occur at Barking Sands are reviewed in advance by a qualified subject matter expert to confirm the effectiveness of measures to avoid harm to historic properties and comply with terms of the 2012 PA. Adverse effects on historic properties on Kaula Island would be minimized through the Memorandum of Agreement as developed in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Therefore, impacts on cultural resources on Barking Sands and Kaula Island would be less than significant.

4 Cumulative Impacts

This chapter (1) defines cumulative impacts; (2) describes past, present, and reasonably foreseeable actions relevant to cumulative impacts; (3) and analyzes the cumulative impacts potentially resulting from the incremental interaction of the Proposed Action with the other actions. The cumulative impact analysis was retained in this EA to maintain consistency with the NEPA Implementing Procedures in effect at the time of its public release. Updated DoD NEPA Implementing Procedures, which took effect on June 30, 2025, no longer require a cumulative impact analysis.

The scope of the cumulative impacts analysis involves both the geographic extent of the effects and the time frame in which the effects could be expected to occur. For purposes of this analysis, past and reasonably foreseeable projects are those within five years of the preparation of this EA (i.e., the time period 2019 through 2029). The geographic extent for the cumulative impacts analysis includes PMRF, while also generally factoring in relevant impacts in surrounding land areas and airspace outward from the boundaries of PMRF. The area of analysis may vary per resource and is determined for each resource section analyzed for cumulative impacts in Section 4.4 (Cumulative Impact Analysis).

Beyond determining that the geographic scope and time frame for the actions interrelate to the Proposed Action, the analysis employs the measure of "reasonably foreseeable" to include or exclude other actions. For the purposes of this analysis, public documents prepared by federal, state, and local government agencies form the primary sources of information regarding reasonably foreseeable actions. Documents used to identify other actions include notices of intent for EISs and EAs, management plans, land use plans, and other planning-related studies.

4.1 Past, Present, and Reasonably Foreseeable Actions

Table 4.1-1 summarizes past, present, and reasonably foreseeable actions while identifying potentially impacted resources relevant to the Proposed Action.

Table 4.1-1: Cumulative Action Evaluation

#	Project	Project Description	Project Timeframe		
			Past	Present	Future
1	Photovoltaic and Battery Energy Storage Systems	Renewable energy project consisting of combined utility-scale photovoltaic array on 87 acres and 94 acres, and overhead or underground electrical transmission lines. The project improved power quality and energy resiliency in support of PMRF. The solar array system can generate up to 44 megawatts of direct current electrical power and feeds electricity into the Kauai Island Utility Cooperative electrical grid for public and military users. The environmental impacts are primarily associated with terrestrial resources.	X		
2	Long-Range Strike Weapons Systems Evaluation Program	The long-range evaluation tests include live and inert weapons systems deployed from aircraft for detonation in the air and at and below the water surface (U.S. Department of the Air Force, 2016). These tests occurred 44 miles offshore of Kauai in the Barking Sands Underwater Range Extension. Missions were proposed to	X		

#	Project	Project Description	Project Timeframe		
			Past	Present	Future
		occur once a year between 2017 and 2022. Detonation produced underwater noise and explosions.			
3	Kawaiele Pump Operation and Maintenance	To ensure PMRF was able to safely conduct its missions with compatible neighbors, the Navy permanently preserved the land adjacent to PMRF for agricultural purposes. The Navy lease of this land includes the Kawaiele and Nohili pump stations and associated ditches. The Navy contracted Agribusiness Development Corporation to operate and maintain these stations.	X		
4	Hawaii-Southern California Training and Testing (HSTT) EIS/OEIS 2018	Sea-based training covered under the HSTT EIS/OEIS does not include land-based components. In the EIS/OEIS, the Navy assessed military readiness activities that could potentially impact human and natural resources, especially marine mammals, sea turtles, and other marine resources. Consultations were conducted under the ESA and MMPA. Proposed military readiness activities included the use of active sonar and explosives within the HSTT Study Area. These military readiness activities are generally consistent with and representative of training and testing that the Navy has been conducting in the HSTT Study Area for decades (U.S. Department of the Navy, 2018a).	X	X	X
5	Hawaii-California Training and Testing (HCTT) EIS/OEIS 2025	At-sea military readiness activities to be analyzed in this EIS/OEIS were previously covered in the 2018 HSTT EIS/OEIS and the 2022 Point Mugu Sea Range EIS/OEIS. Proposed military readiness activities include training and research, development, test, and evaluation activities that are generally consistent with and representative of activities the Navy has been conducting in the Study Area for decades. Proposed military readiness activities include the use of active sonar and explosives within the Study Area.			X
6	Naval Special Operations Training in the State of Hawaii	The Proposed Action includes historical and proposed water and land-based training activities for Special Operations forces. Training activities would occur in areas on Kauai, Oahu, Maui, Lanai, and Molokai.		X	
7	PMRF and KPGO Real Estate EIS	The Navy and NASA are jointly preparing an EIS to evaluate the potential impacts of real estate agreements with the State of Hawaii Department of Land and Natural Resources for state lands at PMRF and KPGO.	X	X	X
8	Coastal Land Development and Tourism	Coastal land development adjacent to the Study Area would include the buildup of homes, businesses, recreation, vacation, and port facilities and marinas on Kauai. Foreseeable coastal tourism development includes (hotels, resorts, restaurants, food industry, and vacation homes), its supporting infrastructure (retail businesses,	X	X	X

#	Project	Project Description	Project Timeframe		
			Past	Present	Future
		marinas, fishing tackle stores, dive shops, fishing piers, recreational boating harbors, beaches), and tourism-related activities (recreational fishing, whale watching). Coastal development intensifies the use of coastal resources through dune and nearshore habitat loss and disturbance, point and nonpoint source water pollution, entrainment in outflows, and air quality degradation.			

Notes: DoD = Department of Defense, EIS = Environmental Impact Statement, OEIS = Overseas Environmental Impact Statement, ESA = Endangered Species Act, KPGO = Kokee Park Geophysical Observatory, MMPA = Marine Mammal Protection Act, NASA = National Aeronautics and Space Administration, PMRF = Pacific Missile Range Facility

4.2 Cumulative Impact Analysis

Cumulative impacts were assessed using quantifiable data where feasible; however, for many of the resources included for analysis, quantifiable data is not available and a qualitative analysis was undertaken. In addition, where the analysis of potential environmental impacts of future actions has not yet been completed, assumptions regarding cumulative impacts related to this EA were made where possible. The analytical methodology presented in Chapter 3 (Affected Environment and Environmental Consequences), which was used to determine potential impacts on the various resources analyzed in this document, was also considered to determine cumulative impacts.

4.2.1 Air Quality

Emissions from proposed training and testing activities are expected to be minor, localized, and intermittent. Due to the distance of most activities from shore and the dispersal of pollutants from regional weather patterns, the cumulative impacts on air quality are not expected to be significant. Other actions, such as construction projects, would also have temporary and minimal emissions. Therefore, the combined effects of all past, present, and future actions would not result in a significant impact on air quality.

4.2.2 Greenhouse Gases

Activities associated with the Proposed Action would generate greenhouse gas emissions from launches, vehicles, and equipment, but there would be no permanent sources. Although the frequency of activities would increase, a significant increase in greenhouse gas emissions is not expected. The estimated increase of 7,602 metric tons of CO_2e per year is considered minor and is not anticipated to contribute to global warming to any discernible extent. Thus, it is anticipated that the incremental contribution of increase in greenhouse gas emissions added to the impacts of all other past, present, and reasonably foreseeable actions would not result in significant climate impacts.

4.2.3 Noise

The primary sources of noise include airfield and range operations, and missile, rocket, and drone launches, as defined in Section 3.3 (Noise). Increased training activities would generate noise from launches and other operations, but these sounds would be intermittent and short-term. While launches do produce intense noise, the events are brief and do not significantly impact nearby residential areas because the closest residential area, Kekaha, is approximately two miles away. Furthermore, established

noise zones and SOPs are in place to safeguard the public and personnel from significant impacts. During launch activities, areas accessible to the public and in proximity to the launch sites would continue to be temporarily closed. These measures ensure that the combined noise from all past, present, and future activities would not result in a significant cumulative impact.

4.2.4 Public Health and Safety

Even with an increase in activity, implementation of the Proposed Action would not significantly increase health and safety risks for military and civilian personnel or the public. All training and testing activities would continue to follow established military training procedures, SOPs, and Occupational Safety and Health Administration regulations. Therefore, the combined effects of the Proposed Action and other past, present, and foreseeable projects would not result in a significant cumulative impact on public health and safety.

4.2.5 Terrestrial Biological Resources

Training and testing activities, while increasing in frequency, would not significantly impact terrestrial biological resources. The proposed activities are consistent with historical events at PMRF, and all operations would follow existing SOPs to avoid damage to vegetation and prevent wildfires. Similarly, potential impacts on wildlife from noise, physical disturbances, and lighting would be temporary and localized. All training events are short in duration, occur within established sites, and would adhere to measures like the Dark Skies policy and other SOPs to minimize effects on wildlife. The combined impacts from the proposed action and other past, present, and future projects would not result in significant cumulative impacts on terrestrial biological resources.

4.2.6 Cultural Resources

Proposed training and testing activities would not significantly impact cultural resources. All operations will follow established SOPs to avoid disturbing archaeological sites. Adverse effects on historic properties on Kaula Island would be minimized through the Memorandum of Agreement as developed in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. The Proposed Action does not include any construction on undeveloped land or ground-disturbing activities in undisturbed areas. Other future actions that have the potential to impact cultural resources would require separate review under NEPA and NHPA to resolve any effects on cultural resources and historic properties.

Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Cultural Resources Manager. Although the increase in the tempo of activities associated with the Proposed Action could the lessen schedule availability, the Action Proponent would continue to provide Native Hawaiians with access to traditional religious and cultural properties, in accordance with the American Indian Religious Freedom Act and EO 13007, Indian Sacred Sites, on a case-by-case basis.

5 Integration of NEPA with Other Environmental Requirements

5.1 Other Federal, State, and Local Laws, Plans, Policies, and Regulations

In accordance with the DoD NEPA Implementing Procedures, environmental documents will be prepared concurrently with and integrated with analyses and related surveys and studies required by other federal statutes. Table 5.1-1 summarizes environmental compliance requirements considered while preparing this EA; see Appendix C (Agency Correspondence) for consultation documentation.

Table 5.1-1: Summary of Environmental Compliance for the Proposed Action

Plans, Policies, and Controls	Status of Compliance
Clean Air Act 42 U.S.C. sections 7401 et seq.) CAA General Conformity Rule (40 CFR part 93[B]) SIP	Criteria pollutant emissions associated with the Proposed Action would not be generated in significant enough quantities to affect the attainment status of the region and would be sufficiently dispersed to not appreciably impact local air quality (see Section 3.1, Air Quality).
Clean Water Act (CWA) (33 U.S.C. 1251 et seq.)	The Proposed Action does not require a permit pursuant to sections 401, 402, or 404 of CWA, as the Proposed Action does not include any activities that would impact water resources.
Coastal Zone Management Act (16 U.S.C. sections 1451–1468)	The Proposed Action would comply with the coastal zone federal consistency process in relation to the Hawaii State Coastal Zone Management Plan for which coastal uses or resources may be affected by the Proposed Action (Section 5.1.1, Coastal Zone Management Act Compliance). Based on an evaluation of the effects of the Proposed Action discussed in the EA, the enforceable policies of Hawaii's Coastal Zone Management Program, and pursuant to 15 CFR section 930.35, the Navy determined that the implementation of the training and testing activities under the Proposed Action are on the list of Navy de minimis activities. The Navy submitted a notification letter of this determination to the Hawaii Office of Planning and Sustainable Development on September 19, 2024. Acknowledgment of receipt and acceptance of the Navy's use of the CZMA *de minimis* list regarding the subject of PMRF land-based training and testing was provided by the State of Hawaii Office of Planning, Hawaii Coastal Zone Management Program on September 30, 2024.
NEPA of 1969 (42 U.S.C. sections 4321, et seq.); DoD NEPA Implementing Procedures	This EA has been prepared in accordance with the DoD NEPA Implementing Procedures.
Endangered Species Act (ESA) (16 U.S.C. sections 1531 et seq.)	The analysis documented in Terrestrial Biological Resources (see Section 3.5, Terrestrial Biological Resources) indicates that the Proposed Action may affect but is not likely to adversely affect terrestrial ESA listed species. Under Section 7 of the ESA, The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to

Plans, Policies, and Controls	Status of Compliance
	adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, and the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island.
National Historic Preservation Act (36 CFR part 800)	The Navy is fulfilling Section 106 requirements in accordance with the 2012 Programmatic Agreement. In response to these comments, and in accordance with the 2012 PA, the Navy is engaging with NHOs, OHA, and SHPD to gather additional information about Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. Subsequently, the Navy determined Kaula Island meets the criteria of a TCP eligible for listing on the NRHP and determined that the proposed undertaking would adversely affect the Kaula Island TCP. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the ACHP, in an effort to resolve adverse effects and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. The MOA will be published once completed. Additional information is included in Sections 3.6.4.1.2 and 3.6.5.2.2 of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence).
Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. 3001 et seq.)	In the event human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered, the Navy would consult with Native Hawaiian Organizations in accordance with the existing NAGPRA Comprehensive Agreement.
Migratory Bird Treaty Act (MTBA) (16 U.S.C. sections 703-712)	Implementation of the Proposed Action is not anticipated to result in significant adverse effects on migratory bird populations and would be in compliance with MBTA regulations (see Section 3.5, Terrestrial Biological Resources). The Navy met with the USFWS Migratory Bird Treaty Act (MBTA) office in November 2024 to discuss the Proposed Action as it relates to migratory birds; the Final EA was updated in accordance with the outcome of that discussion.
Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.)	Any in-water effects associated with the Proposed Action are analyzed and documented in the 2018 Final HSTT EIS/OEIS and authorized in the 2018 MMPA Letter of Authorization.
EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* (62 FR 19885 [April 23, 1997])	The Proposed Action would not result in environmental health and safety risks that may disproportionately affect children.

Plans, Policies, and Controls	Status of Compliance
EO 12088, *Federal Compliance with Pollution Control Standards*	All necessary actions would be taken for the prevention, control, and abatement of environmental pollution related to the Proposed Action.
EO 13007, *Accommodation of Sacred Sites*	All necessary actions would be taken to avoid impacting the physical integrity of sacred sites in the Study Area, as well as accommodate the use of sacred sites for native populations.
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. section 9601 et seq.)	There are no CERCLA-designated sites identified within the Study Area. Therefore, the Proposed Action is in compliance with this regulation.
Emergency Planning and Community Right-to-Know Act (42 U.S.C. sections 11001 et seq.)	All necessary actions would be taken to inform the public of the storage, use, and release of any potential hazardous and toxic chemicals in their communities.
Energy Independence and Security Act of 2007 (42 U.S.C. section 17001 et seq.)	The Proposed Action would be implemented in compliance with this regulation.
Resource Conservation and Recovery Act (42 U.S.C. section 6901 et seq.)	The Proposed Action would be implemented in compliance with this regulation.
Pollution Prevention Act of 1990 (42 U.S.C. section 13101 et seq.)	PMRF spill response and prevention procedures would be in place to prevent and respond to potential spills in the Study Area. All necessary actions would be taken for the prevention, control, and abatement of pollution related to the Proposed Action.
Federal Aviation Act of 1958 (49 U.S.C. 1301 et seq.)	Navy has coordinated with FAA in the establishment of all existing airspace. No new airspace is being designated in this Proposed Action.
Toxic Substances Control Act (15 U.S.C. sections 2601 et seq.)	The Proposed Action would be implemented in compliance with this regulation.

Notes: ACHP = Advisory Council on Historic Preservation, CFR = Code of Federal Regulations, EIS/OEIS = Environmental Impact Statement/Overseas Environmental Impact Statement, EO = Executive Order, FR = Federal Register, HSTT = Hawaii-Southern California Training and Testing, MOA = Memorandum of Agreement, NEPA = National Environmental Policy Act, NHO = Native Hawaiian Organization, OHA = Office of Hawaiian Affairs, PA = Programmatic Agreement, SHPD = State Historic Preservation Division, SIP = State Implementation Plan, TCP = Traditional Cultural Place, U.S.C. = United States Code

5.2 Irreversible or Irretrievable Commitments of Resources

Resources that are irreversibly or irretrievably committed to a project are those that are used on a long-term or permanent basis. This includes the use of non-renewable resources, such as metal and fuel, and natural or cultural resources. These resources are irretrievable in project use, which would preclude them from being used for other purposes. Human labor is also considered to be destruction of natural resources that could limit the range of potential uses of that environment.

Although the activities at PMRF would result in some irreversible or irretrievable commitment of resources, such as various metallic materials, fuel, and labor, natural and cultural resources are not committed in significant quantities given the frequency and duration of proposed training and testing activities as detailed in Chapter 2 (Description of Proposed Action and Alternatives). As a result, the amount of materials required and energy used during proposed training and testing activities would be

minimal. Thus, the Proposed Action would not result in significant irreversible or irretrievable commitment of resources.

5.3 Relationship Between Short-Term Land Use and Long-Term Productivity

In accordance with the DoD NEPA Implementing Procedures (June 30, 2025), this EA includes an analysis of the relationship between the short-term impacts on the environment and the effects those impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. This refers to the possibility that using a parcel of land or other resources often eliminates the possibility of other uses at that site.

In the short term, effects on the human environment with implementation of the Proposed Action would be considered minimal. Training and testing activities would generally be consistent with the existing land use at PMRF. The Proposed Action does not include construction on undeveloped lands or permanent ground-disturbing activities over an undisturbed area. As discussed in Chapter 3 (Affected Environment and Environmental Consequences), the implementation of the Proposed Action would result in less than significant impacts on resources analyzed. As a result, the Proposed Action would not significantly impact the long-term natural resource productivity of the area or permanently narrow the range of beneficial uses of the environment.

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Appendix A: Military Readiness Activity Descriptions

Environmental Assessment

Pacific Missile Range Facility

Land-Based Training and Testing

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APPENDIX A Military Readiness Activity Descriptions

A.1 Description of Military Readiness Activities

The Pacific Missile Range Facility (PMRF) land-based military readiness activities associated with the Proposed Action are described in detail below. Training and testing activities may be combined sequentially or accomplished in parallel. The overall study area consists of the land portion of Barking Sands and Kaula Island (Figure A-1).

Training events are generally progressive in nature and would range between one hour and two weeks and be episodic in terms of duration in any 24-hour period, as some events may be start-stop and not continuous in any given day, depending on the specific activity. Not all locations within the Study Area may be utilized over a given year period. Training and testing schedules are highly variable, dependent on individual and collective unit readiness requirements, deployment cycles, and resource availability.

Since range users conduct several activities within larger training exercises, descriptions of those larger exercises are included here. These larger exercises are comprised entirely of individual activities. For example, one large exercise may include bivouacking, several missile launches, and Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting (C5ISRT).

The number of personnel participating in military readiness activities varies depending on the specific activity type, according to the size categories in Table A-1.

Table A-1: Activity Personnel Levels

Activity Size	Number of Personnel
Squad	10–15
Unit	30–40
Medium	Up to 100
Large	Up to 300

This EA analyzes the effects from training and testing activities that are conducted on land at Barking Sands; however, in some cases, land-based training and testing activities may include or impact an at-sea component or the use of PMRF's airfield. The impact analysis covers when a launch system moves to a launch location on Barking Sands, or when a unit arrives at Barking Sands to conduct training or testing activities, and not the entire potential support or logistics chain external to PMRF.

Airfield operations and any effects at sea associated with land-based military readiness activities are considered in other National Environmental Policy Act documents. At-sea and air-based component effects were previously analyzed in the 2008 Hawaii Range Complex Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) and 2018 Final Hawaii-Southern California Training and Testing EIS/OEIS. Additional airfield and landing zone operations connected with specific activities are analyzed in this EA.

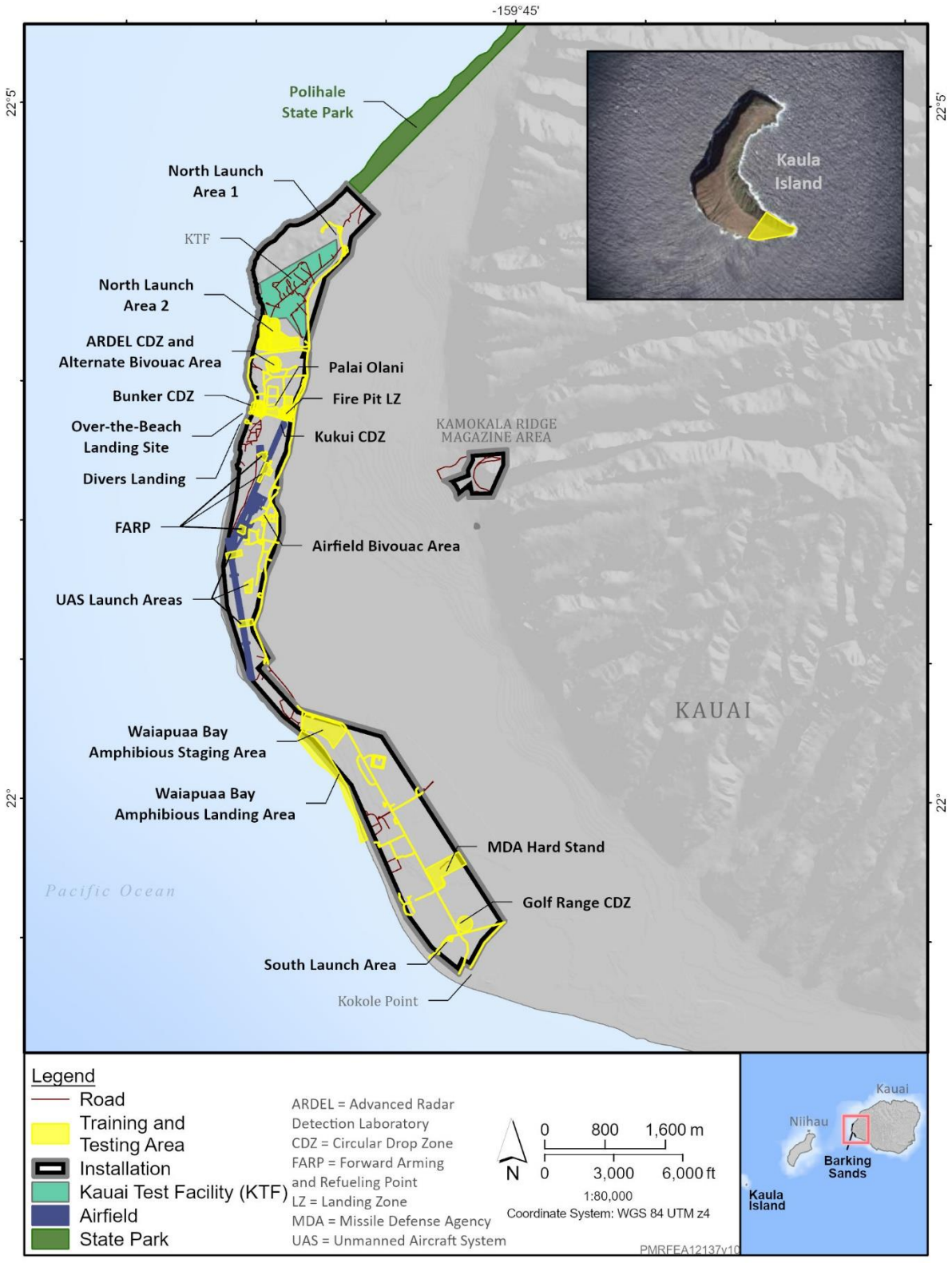


Figure A-1: Site Locations

A.1.1 Missile, Rocket, Aerial Target Drone Launch

Activity Description: Ground-launched missiles and rockets may be required for a variety of training and testing purposes (e.g., offensive and defensive systems, kinetic and non-kinetic intercepts).

Training and testing require an assortment of realistic and challenging targets. Aerial targets are used in training and testing events that involve detecting, tracking, defending against, and attacking enemy missiles and aircraft. Aerial targets include expendable rocket-powered missiles and recoverable radio-controlled drones (e.g., BQM, Airborne Drone Missile Target) used for gunnery and missile exercises. During missile defense Research, Develop, Test, and Evaluation engagements, a ballistic missile target vehicle can be launched from PMRF, a ship, or aircraft and intercepted by a ship- or land-launched missile.

Other missiles launched from PMRF emulate enemy ballistic missile threats for Navy at-sea training exercises. Simulating enemy surface-to-air missile launches, Smokey Sams are fired from North Launch Area 2. These are small, simple rockets made of phenolic paper and Styrofoam fins that produce a highly visible, thick white cloud of smoke when fired. Unguided, they rise to an altitude of 2,000 feet above the terrain. These rockets support aircrew training in Electronic Warfare countermeasures employment. Typically, Smokey Sams are launched in groups of two at one time, up to 20 launches over an hour, during 10 such annual individual training activity periods.

During a ground-launched missile, rocket, or aerial target drone event, the launchers, some fixed and some mobile, are established within current Barking Sands launch areas and oriented such that the missile, rocket, or aerial target drone head directly toward the open ocean, all within PMRF's restricted airspace. Depending on the missile, rocket, or aerial target drone type, their acceleration and launch elevation are such that they rapidly depart the launch area, producing a brief engine exhaust plume and acoustic load.

Guidance systems and advanced fusing technology ensure that missiles reliably impact on or detonate near their intended target.

Locations:

- North Launch Area 1
  North Launch Area 2

Duration (Day/Night/Frequency): Launches can occur day or night, predominately during the day.

The tempo of these types of activities fluctuate year to year. Larger exercises such as Rim of the Pacific (RIMPAC) Exercise or Large-Scale Exercise may increase the tempo of activities in a given year. Tempo of launches and live-fire activities may also fluctuate during an exercise based on the logistics and purpose of the training or testing exercise. For example, some exercises involve launches of multiple aerial targets, or missiles and rockets, in one day, consecutive days, or spaced out over multiple days based on the requirements and mission of the exercise. Launches can be 30 seconds apart or hours apart; or one target, missile, or rocket may be launched during the day and one at night. Larger-scale exercises may involve 15–17 launches during the exercise with the possibility of four launches in one day. Some exercises include dual launches where multiple targets, missiles, or rockets could be launched at the same time. A missile or rocket activity may include up to two launches per a single launch salvo. An aerial drone target activity may include up to four launches per a single launch salvo. A typical Marine Corps Navy Marine Expeditionary Ship Interdiction System (NMESIS) launching may last for three days, which includes setup and pre-launch safety checks. Army missile/rocket launches would have a similar

duration. Missile Defense Agency missile launch activities missions may exceed 40 days in duration, accounting for target buildup, rollout to a launch pad, launching, and equipment tear-down and removal. The annual number of activities is listed in Table 2.1-1 of this EA.

Typical Components (Systems/Vehicles/Munitions): Many different systems, vehicles, and munitions may be used. Existing fixed systems include the BQM-34, BQM-177, MK-5, and GQM-163 launchers in North Launch Area 1; the 50K Launcher, MDA Vertical Launch System (VLS), Aegis Weapons System, and Terminal High Altitude Area Defense (THAAD) launch areas/pads in Northern Launch Area 2. Mobile systems that range users may bring include things like NMESIS, Mid-Range Capability (MRC), and High Mobility Artillery Rocket System (HIMARS). All activities are analyzed using the largest potential system, to be conservative (e.g., heaviest vehicle, loudest launch platform), though in reality some activities may use smaller, less impactful systems.

The NMESIS provides the capability to fire anti-ship missiles from land (Figure A-2). It combines the Naval Strike Missile (NSM) Launcher Unit with the Remote Operated Ground Unmanned Expeditionary (ROGUE) Fires Carrier. The ROGUE Fires Carrier consists of a missile launcher built on top of a joint light tactical vehicle (JLTV).

Army HIMARS (Figure A-3) and BQM-177 or BQM-34 aerial drone target (Figure A-4) launches would follow the similar set-up and launch steps. HIMARS ground support includes up to 15 vehicles, a combination of launch support equipment, trucks, and JLTVs.

Personnel: A single NMESIS section would consist of a squad of Marines and three JLTV vehicles: one leader JLTV vehicle, one command and control JLTV vehicle, and one JLTV launcher vehicles. Army HIMARS launch activities would be supported by a medium-sized personnel group (Table A-1).

Assumptions used for analysis are contained in Table A-2.

Table A-2: Missile, Rocket, Aerial Target Drone Launch

Missile, Rocket, Aerial Target Drone Launch	
Assumptions Used for Analysis	
Generators	Missile Defense Agency: 3 generators Army: 2 generators Marines: 0 generators
Lighting	For night operations, tactical control screens use adjustable brightness settings and red wavelength in order to preserve night vision. Only those lights required for safe operations are used. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policy (Dark Skies).
Ground Disturbance	Stabilizing system (using shovels) requires approximately 18 inches of ground below level to be disturbed. Locations require PMRF approval (dig permit).



Figure A-2: NMESIS Launch



Figure A-3: HIMARS Launch



Figure A-4: BQM-177 (Aerial Target) Drone Launch

A.1.2 Missile, Rocket, Aerial Target Drone Set-up (No Launch)

Activity Description: Similar to the live-fire event described above, a no launch system set-up includes all the same launch system preparation, without the actual launch. In general, this event is designed for launch crew proficiency training, but it also includes exercising the transportation and logistical support elements of missile system deployment. Many types of systems may be used, some of which are vehicle-based and some of which are trailered.

Locations:

- North Launch Area 1
- North Launch Area 2
- South Launch Area

Duration (Day/Night/Frequency): Simulated launch activities may occur day or night. A typical NMESIS launch set up, simulated launch, and pack up may last several hours or up to three days. The annual number of activities is listed in Table 2.1-1 of this EA.

Typical Components (Systems/Vehicles/Munitions): A No Launch NMESIS training event can consist of up to three five-vehicle sections of JLTVs, 15 vehicles in total. Vehicles would drive to the launch site after departing Barking Sands' amphibious landing area or from a transport aircraft at PMRF's airfield. Once at the notional firing positions, sections would establish communications with other Marine Corps units operating in conjunction, passing information and target data across communication data systems. This simulated target data would be relayed to NMESIS ground forces, who would then simulate firing at a simulated target (i.e., no actual firing of the weapon system would occur). NMESIS training participants would then pack up the equipment and depart via the same mode of travel as arrival.

A similar Army missile system intended for No Launch training activities at PMRF would be supported by an equivalent number and types of vehicles. An MRC battery is to be equipped with multiple large transport vehicles, trailers, generators, cabling, and support vehicles.

Personnel: NMESIS and similar Army No Launch activities would be supported by medium-sized groups of personnel (Table A-1).

Assumptions used for analysis are contained in Table A-3.

Table A-3: Missile, Rocket, Aerial Target Drone Set-up (No Launch)

Missile, Rocket, Aerial Target Drone Set-up (No Launch)	
Assumptions Used for Analysis	
Generators	Missile Defense Agency: 2 generators Army: 2 generators Marine Corps: no separate generators.
Lighting	For night operations, tactical control screens use adjustable brightness settings and red wavelength in order to preserve night vision. Only those lights required for safe operations are used. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Army: Stabilizing system (using shovels) requires approximately 18 inches of ground below level to be disturbed. Ground-disturbing activities require PMRF approval (dig permit). Marine Corps: none.

A.1.3 Artillery

Activity Description: During an artillery training period, land-based forces fire artillery guns at surface (waterborne) targets. Artillery guns are oriented such that the artillery round heads directly toward the open ocean, with impact zones further than 3 NM from the shore, all within PMRF's restricted airspace. A typical artillery system is the M777 Howitzer, a mobile live-fire system that fires 155-millimeter (mm) rounds (Figure A-5). Other artillery systems fire smaller 105 mm rounds.

Location:

- North Launch Area 2

Duration (Day/Night/Frequency): Firing can occur day or night. A typical short duration M777 fire mission training period is four hours, firing multiple single rounds and multiple successive rounds (salvo) rounds (all guns firing at the same time). Both Marine Corps and Army training periods are approximately four days. The annual number of activities is listed in Table 2.1-1 of this EA.

Typical Components (Systems/Vehicles/Munitions): A typical artillery system is the Army M777 Howitzer, firing 155mm artillery rounds (Marine Corps, 220 rounds; or Army, 300 rounds, per a single activity period). The M777 is transported via a 7-ton truck (also carrying munitions), or sling-loaded under a heavy-lift helicopter to a firing location. For ground movement, the Army and Marine Corps uses four 7-ton trucks and two JLTVs. Both Army and Marine Corps firing batteries contain six M777 Howitzers.

Personnel: Both Army and Marine Corps M777 or similar artillery system training would involve unit-sized numbers of personnel (Table A-1).

Assumptions used for analysis are contained in Table A-4.



Figure A-5: M777 Howitzer Firing

Table A-4: Artillery

Artillery	
Assumptions Used for Analysis	
Generators	None
Lighting	Flashlights. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	The M777 stabilizing system (using shovels) requires approximately 18 inches below ground level to be disturbed. Ground-disturbing activities require PMRF approval (dig permit).

A.1.4 Amphibious Warfare Training

Activity Description: Amphibious warfare training ranges from individual, crew, and small unit events to large task force exercises. Individual and crew training include amphibious vehicles and naval gunfire support training. Such training includes shore assaults, boat raids, airfield or port seizures, and reconnaissance. Barking Sands has previously supported training of amphibious raids, small boat landings, and swimmer insertions/extractions. In support of this training, an amphibious staging area ashore is used to provide a location between the amphibious landing area (beach) and inland amphibious objectives, where troops and equipment may be concentrated and synchronized for further movement.

A.1.4.1 Amphibious Raid

During an amphibious raid, unit-sized forces move from amphibious ships at sea; conduct amphibious landing via various vessels/watercraft/vehicles, such as an Amphibious Combat Vehicle or Landing Craft Air-Cushioned (LCAC) (Figure A-6); and conduct follow-on activities ashore. At completion, ground forces retrograde to amphibious ships at sea.



Figure A-6: Amphibious Combat Vehicle Departing a Landing Craft Air-Cushioned

A.1.4.2 Amphibious Small Boat Landing

During small boat beach landing training (Figure A-7), a unit-sized force using small boats moves from offshore location to a beach landing site, carries the boats to an inland site, conducts reconnaissance, and then returns to the sea via small boats.



Figure A-7: Small Boat Beach Landing Training

A.1.4.3 Amphibious Swimmer Insertion and Extraction

During swimmer over-the-beach landing training (Figure A-8), personnel conduct underwater swimmer insertion and extraction training at Barking Sands' amphibious landing areas.



Figure A-8: Swimmer Over-the-Beach Landing Training

Duration (Day/Night/Frequency): Activities may occur day or night. In general, amphibious raid training occurs as a subset element of a larger exercise such as the RIMPAC exercise. The annual number of activities is listed in Table 2.1-1.

Small boat landing training occurs monthly for a one-day period, and swimmer insertion/extraction training occurs twice yearly for a one-day period.

Locations:

- Amphibious Raid: Waiapuaa Bay
- Small boat landings: Waiapuaa Bay and the Divers Landing area
- Swimmer insertion/extraction only landings: Waiapuaa Bay, Divers Landing area, and the Swimmer Over-the-Beach Landing area

Typical Components (Systems/Vehicles/Munitions): Amphibious raids may use the Amphibious Combat Vehicle, or similar type vehicles, and LCAC for rapid movement from ship at sea to the amphibious landing area. Small boat training entails use of Combat Rubber Raiding Craft (CRRC). Swimmer insertion/extraction may use SCUBA-type equipment.

Personnel: An amphibious raid activity is supported by a unit-sized group. Small boat and swimmer training involves a squad-sized group for both the Marine Corps and Army (Table A-1).

Assumptions used for analysis are contained in Table A-5.

Table A-5: Amphibious Warfare Training

Amphibious Warfare Training	
Assumptions Used for Analysis	
Generators	None
Lighting	Consistent with safe operations and tactical level of training ashore. Units training or testing during certain critical bird activity periods or sea turtle nesting periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Personnel and vehicle movement over the beach is restricted and must remain within maintained corridors or pathways approved by PMRF.

A.1.5 Forward Arming and Refueling Point

Activity Description: During Forward Arming and Refueling Point (FARP) activities, a FARP site is established, operated, and disassembled using expeditionary aircraft refueling systems (Figure A-9). Pumps and fuel storage bladders for delivering aircraft fuel are employed, with spill containment capability, at landing zones, which include grounding points to mitigate fire risk, or other suitable aviation support locations.

Duration (Day/Night/Frequency): FARP activities may occur day or night. A FARP site is established and operated from between 1 and 5 days. The number of aircraft refueled per day ranges from 1 to 40. The refueling duration during which aircraft engines are running at ground idle is approximately one half hour. The annual number of activities is listed in Table 2.1-1 of this EA.

Location:

- Aircraft parking area and adjacent unpaved area (fuel bladder) with established electrical grounding points, within PMRF's airfield boundaries.

Typical Components (Systems/Vehicles/Munitions): The Marine Corps employs two types of fuel delivery systems for FARP operations, the Tactical Airfield Fuel Dispensing Systems (TAFDS) and Helicopter Expedient Refueling System (HERS). The TAFDS is ground based and uses one JLTV-type vehicle and one generator to support the FARP operations. The HERS is ground based but is used to deliver fuel from a CH-53 or KC-130. Aircraft types that may participate in this activity are helicopters and tilt-rotor aircraft (CH-47, AH-64, MV-22), and fixed-wing fighters (FA-18, F-35).

Personnel: A single FARP site is supported by a squad-sized group (Table A-1).

Assumptions used for analysis are contained in Table A-6.

Table A-6: Forward Arming and Refueling Point

Forward Arming and Refueling Point	
Assumptions Used for Analysis	
Generators	Marine Corps and Air Force: One, 8 hours/day. Fuel type is JP-8.
Lighting	Flashlights. Minimal, consistent with the conduct of safe airfield ground operations. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Grounding locations, provided by PMRF airfield.



Figure A-9: Forward Arming and Refueling Point

A.1.6 Small Unmanned Aircraft Systems and Counter-Small Unmanned Aircraft Systems

Activity Description: During Small Unmanned Aircraft Systems (sUAS) activities personnel launch, operate, and recover sUAS vehicles (Groups 1, 2, and 3), which may be used for support missions such as reconnaissance or airborne communication relay, or as aerial targets. The Department of Defense classifies Unmanned Aircraft Systems (UASs) by group: Group 1, weighs typically less than 20 pounds; Group 2, weighs between 21 and 55 pounds; Group 3, weighs more than 55 but less than 1,320 pounds; Group 4, weighs more than 1,320 pounds, normally operates below 18,000 feet; Class 5, weighs more than 1,320 pounds, normally operates above 18,000 feet. Groups 4 and 5 activities are not part of this Proposed Action as they are considered airfield operations.

During counter sUAS training, a sUAS team launches and controls a counter-UAS system from a terrestrial location. The system defeats UAS through disruption and jamming of position, timing, navigation, command link, and video downlink signals to and from ground command station. The objective includes detection, identification, and defeat of hostile sUAS systems.

Duration (Day/Night/Frequency): sUAS missions may occur day or night, generally lasting up to two hours, with most being one-half to one hour in duration. The annual number of activities is listed in Table 2.1-1 of this EA.

Location:

- Groups 1 and 2, take-off and landing locations within the PMRF airfield, no kinetic operations over land
- Group 3, take-off and landings at PMRF airfield, no kinetic operations over land

Typical Components (Systems/Vehicles/Munitions): All sUASs have a flight vehicle and a ground control device. Groups 1 and 2 may be hand launched or take off from a small ground area (Figure A-10).

Most systems require battery power for flight and control. UAS landing is generally via a hover flight mode to a small ground area, or a catch net. One vehicle, typically a JLTV-sized vehicle, is used for mobility and ground control device power. Group 3 UASs take off may launch next to the runway using a catapult system and land on PMRF's runway or taxiway.

Personnel: sUAS operations involve a squad-sized group (Table A-1).

Assumptions used for analysis are contained in Table A-7.

Table A-7: Small Unmanned Aircraft Systems and Counter-Small Unmanned Aircraft Systems

sUAS and Counter-sUAS	
Assumptions Used for Analysis	
Generators	All Services: one for some events.
Lighting	Consistent with aviation safety of flight (aircraft position lights at night) and tactical lighting of the ground control device. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Potentially for Group 3 ground control systems. Catch net may use stabilizing tent stakes, with 18-inch length, 5/8-inch diameter. Ground-disturbing activities require PMRF approval (dig permit).



Figure A-10: Small Unmanned Aerial Vehicle Launch

A.1.7 Parachute Operations (Personnel Insertion)

Activity Description: During parachute operations, personnel or equipment land within designated drop zones (Figure A-11).

Duration (Day/Night/Frequency): Parachute operations may occur day or night, with events lasting up to four hours. The annual number of activities is listed in Table 2.1-1 of this EA.

Locations:

- Four drop zones within PMRF boundaries:
  - ARDEL (Advanced Radar Detection Laboratory) Circular Drop Zone (CDZ)
  - Bunker CDZ (north of Palai Olani Road)
  - Golf Range CDZ
  - Kukui CDZ

Typical Components (Systems/Vehicles/Munitions): Parachute operations do not require vehicles or generators.

Personnel: Parachute operations involve a squad-sized group (Table A-1).

Assumptions used for analysis are contained in Table A-8.

Table A-8: Parachute Operations (Personnel Insertion)

Parachute Operations (Personnel Insertion)	
Assumptions Used for Analysis	
Generators	None
Lighting	During night and low visibility, zones are marked by a specific lighting pattern, visible from above the designated drop zone. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	None



Figure A-11: Parachute Landing (Personnel Insertion)

A.1.8 Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting (C5ISRT)

Activity Description: During C5ISRT activities, personnel establish and operate tactical field command post, communication systems, radar tracking and surveillance systems, optical tracking systems, or electronic warfare equipment (Figure A-12). May use existing facilities (at on-going level) or mobile systems (vehicle based, standalone). Likely to be associated with/in support of other concurrent activities.

Duration (Day/Night/Frequency): C5ISRT events may occur day or night. A typical duration is between 3 and 10 days but can be as long as 60 days. The annual number of activities is listed in Table 2.1-1 of this EA.

Locations:

- North Launch Area 1
- North Launch Area 2
- South Launch Area
- Missile Defense Agency Hard Stand

Typical Components (Systems/Vehicles/Munitions): Communications transmitter/receiver terminals are established to conduct data and voice transfer among participating training entities. Other systems track missiles, aircraft, and ships; detect electromagnetic radiation; or transmit radiation simulating enemy systems.

Personnel: Some events will be squad sized, while others are medium-sized groups (Table A-1).

Assumptions used for analysis are contained in Table A-9.

Table A-9: Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance, and Targeting

C5ISRT (to include Command Post Exercise, Communication Relay Exercise)	
Assumptions Used for Analysis	
Generators	Some events may require generator power.
Lighting	Lighting may be required to support night operations. Flashlights. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Generators, sensors, and other equipment that require grounding. Potential tent poles/stakes. No trenching. Tent stakes, 18-inch length, 5/8-inch diameter. Locations require PMRF approval (dig permit).
Radiation Hazards	Implementation of control measures and safety protocols to address Hazards of Electromagnetic Radiation to Personnel, Fuel, and Ordnance (HERP/HERF/HERO) and restricted to approved training and testing areas.



Figure A-12: Communication Operations

A.1.9 Bivouac

Activity Description: During deployment to Barking Sands to conduct other training or testing, personnel establish and operate expeditionary field lodging (tents) (Figure A-13).

Duration (Day/Night/Frequency): Bivouacking occurs both day and night. Typical bivouac duration is four days, with an extended period up to 10 days. Based on other activities likely to be associated with or in support of other concurrent activities, of which bivouacking supports. The annual number of activities is listed in Table 2.1-1.

Location:

- Airfield Bivouac Area (Bivouac Area 1)
- North Launch Area 2 Bivouac Area
- Palai Olani Bivouac Area
- Missile Defense Agency Hard Stand

Typical Components (Systems/Vehicles/Munitions): The Services have varied bivouac tentage: Marine Corps, two-person; Army, four-person; Air Force, 20-person shelters.

Personnel: Small and short duration events would be supported by squad-sized groups, while some multi-service events would be supported by large groups (up to 300 individuals in support of a RIMPAC exercise) (Table A-1). Assumptions used for analysis are contained in Table A-10.

Table A-10: Bivouac

Bivouac	
Assumptions Used for Analysis	
Generators	Air Force: Two generators for large events.
Lighting	Flashlights. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Tent stakes, 18-inch length, 5/8-inch diameter.



Figure A-13: Establishing Bivouac Site

A.1.10 Air-to-Ground Gunnery Exercise

Activity Description: During air-to-ground gunnery training, aircraft crews use guns and rocket launchers to practice attacks on ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures, or personnel. Aircrew aim for points within the target area. Munitions used during training and testing in the Study Area are non-explosive (inert).

Duration (Day/Night/Frequency): Gunnery Exercise (GUNEX) may occur day or night. The annual number of activities is listed in Table 2.1-3 of this EA.

Location (Figure A-14)**:**

- Kaula Island (southern 1,000 feet tip of the island, approximately 11 acres).

Typical Components (Systems/Vehicles/Munitions): Aircraft machine gun systems (e.g., 30 mm) and (e.g., inert 2.75-inch rockets, and Hellfire missiles) are aircraft-fired/launched inert munitions used within the Kaula Island target area (Figure A-15). Aircraft laser systems are used to provide accurate distance from aircraft to target.

Personnel: Aircrew of fixed-wing (fighter-type jets), helicopters, and rotary-wing aircraft.

Associated Munitions Constituents:

- Gunnery training practice projectiles are primarily composed of steel.

Assumptions used for analysis are contained in Table A-11. Past utilization of Kaula Island for GUNEX events is included in Table A-12. Current environmental coverage under the 2008 Hawaii Range Complex EIS allows for 18 GUNEX activities at Kaula Island on an annual basis.

Before firing by any aircraft, pre-surveys will be conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island; or if monk seals are on the ledges

around the southern impact area. Presence of any of the above mentioned prohibits ordnance delivery until areas are cleared.

Table A-11: Air-to-Ground Gunnery Exercise

Air-to-Ground Gunnery Exercise	
Assumptions Used for Analysis	
Generators	None
Lighting	None
Ground Disturbance	Inert bullet and rocket impacts

Table A-12: Past Kaula Island Utilization for GUNEX Events

Year	Number of GUNEX Events
2013	2
2014	13
2015	11
2016	8
2017	11
2018	12
2019	2
2020	6
2021	4
2022	0
2023	0
2024	0
2025*	0

*Usage as of July 31, 2025.

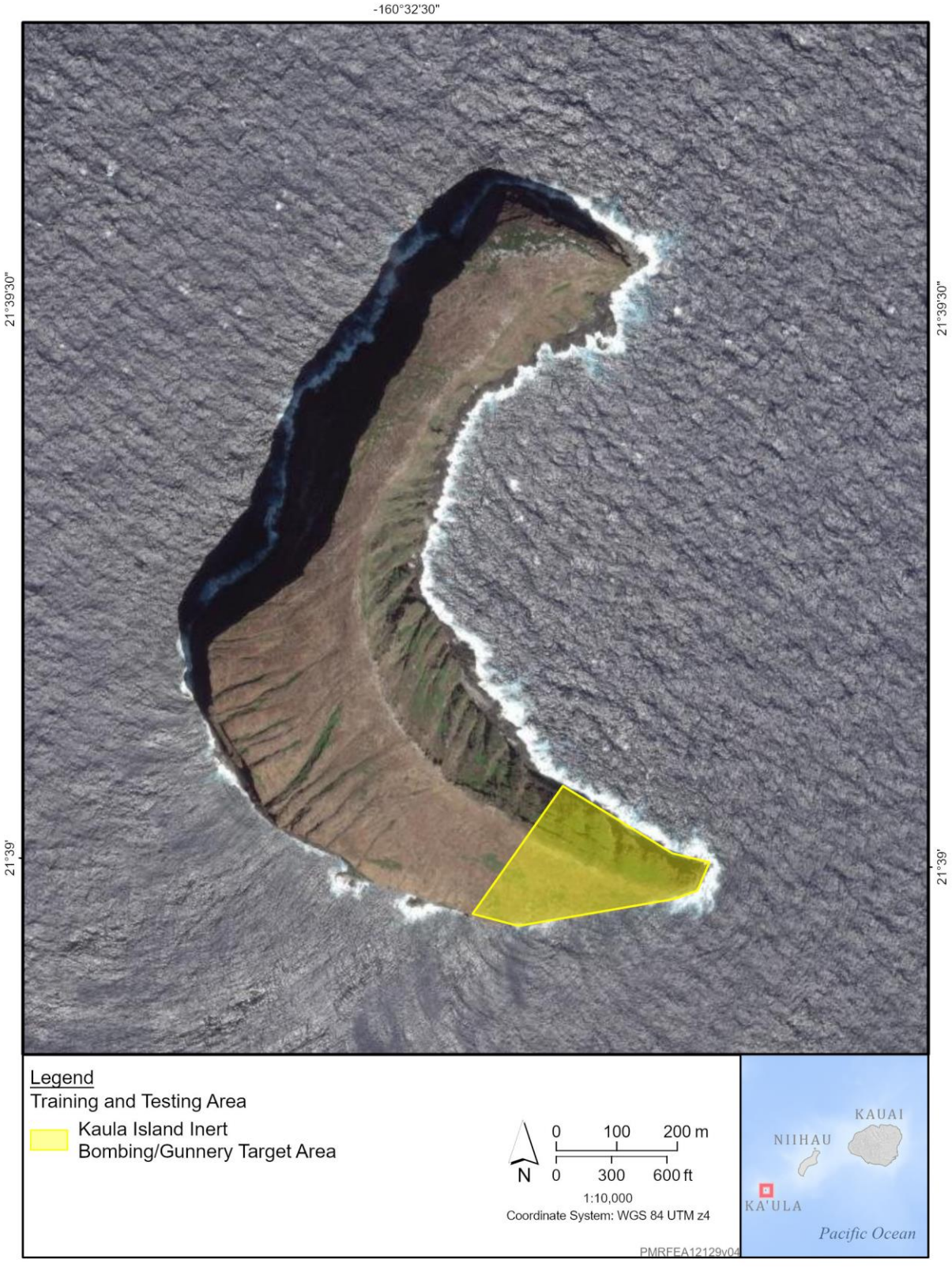


Figure A-14: Kaula Island



Figure A-15: Helicopter Firing Inert Rockets

A.1.11 Air-to-Ground Bombing Exercise

Activity Description: During air-to-ground bombing training, strike fighter aircraft deliver ordnance against land targets in day or night conditions. Bombs are unpowered munitions dropped from aircraft on land targets. Bombs used during training and testing in the Study Area are non-explosive (inert). General Purpose (inert) bombs are non-explosive practice munitions containing a spotting (smoke) charge to aid in scoring the accuracy of hitting the target during training and testing activities. These bombs are filled with inert material (steel and concrete) (Figure A-16). Subscale bombs (Figure A-17) are non-explosive practice munitions containing a spotting (smoke) charge to aid in scoring the accuracy of hitting the target during training and testing activities. Common subscale bombs are 25 pounds and less and are steel constructed. Laser-guided training rounds are another variation of a subscale practice bomb. They weigh approximately 100 pounds and are cost-effective, non-explosive weapons used in training aircrew in laser-guided weapons employment.

Duration (Day/Night/Frequency): Bombing Exercise (BOMBEX) may occur day or night. No bomb drops are authorized through overcast or without positive identification of the target. Before firing by any aircraft, pre-surveys will be conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island; or if monk seals are on the ledges around the southern impact area. Presence of any of the above mentioned prohibits ordnance delivery until areas are cleared. The annual number of activities is listed in Table 2.1-3.

Location:

- Kaula Island (southern 1,000 feet tip of the island, approximately 11 acres).

Typical Components (Systems/Vehicles/Munitions): Inert general-purpose and sub-scale bombs are aircraft-delivered munitions used within the Kaula Island target area. Aircraft laser systems are used to provide accurate distance from aircraft to target.

Personnel: Aircrew of fixed-wing (fighter-type jets) aircraft.



Figure A-16: Aircraft-Loaded Inert General-Purpose Bombs



Figure A-17: Aircraft-Loaded Subscale Inert Bombs

Associated Munitions Constituents:

- Non-explosive bombs are configured to have the same weight, size, center of gravity, and ballistics as explosive bombs. Practice bombs do not contain the explosive materials.
- Non-explosive practice munitions consist of ammunition and components that contain no explosive material, and may include (1) ammunition and components that have had all explosive material removed and replaced with non-explosive material, (2) empty ammunition or components, and (3) ammunition or components that were manufactured with non-explosive material in place of all explosive material. These practice munitions vary in size from 25 to 500 pounds and are designed to simulate the characteristics of explosive munitions for training and testing activities. Some non-explosive practice munitions may also contain unburned propellant, and some may contain spotting charges or signal cartridges for locating the point of impact (e.g., smoke charges for daylight spotting or flash charges for night spotting).
- Large, non-explosive bombs—also called "practice" or "bomb dummy units"—are composed mainly of iron and steel casings filled with sand, concrete, or vermiculite.

Assumptions used for analysis are contained in Table A-13. Past utilization of Kaula Island for BOMBEX events is included in Table A-14. Current environmental coverage under the 2008 Hawaii Range Complex EIS allows for 250 Navy BOMBEX activities at Kaula Island on an annual basis.

Table A-13: Air-to-Ground BOMBEX

Air-to-Ground BOMBEX	
Assumptions Used for Analysis	
Generators	None
Lighting	None
Ground Disturbance	Inert bomb impact

Table A-14: Past Kaula Island Utilization for BOMBEX Events

Year	Number of BOMBEX Events
2013	5
2014	23
2015	6
2016	9
2017	19
2018	14
2019	2
2020	1
2021	4
2022	4
2023	1
2024	0
2025*	0

*Usage as of July 31, 2025.

A.1.12 Landing Zone Operations

Activity Description: During landing zone training, helicopter or tilt-rotor aircrew deliver and recover personnel or equipment at unimproved landing zone locations.

Duration (Day/Night/Frequency): Landing zone operations may occur day or night and may be eight hours in duration. The annual number of activities is listed in Table 2.1-1 of this EA.

Location:

- Fire Pit Landing Zone (LZ)

Typical Components (Systems/Vehicles/Munitions): Helicopters such as the CH-47 (Figure A-18) and CH-53, or tilt-rotor aircraft such as the MV-22.

Personnel Size: LZ ground personnel would be squad sized (Table A-1).

Assumptions used for analysis are contained in Table A-15.

Table A-15: Landing Zone Operations

Landing Zone Operations	
Assumptions Used for Analysis	
Generators	None
Lighting	Potential Landing Zone lighting for night operations. Units training or testing during certain critical bird activity periods would adhere to PMRF's night lighting policies.
Ground Disturbance	Possible surface erosion from helicopter rotor down-wash.



Figure A-18: Helicopter Sling Load of M777 Howitzer

A.1.13 Major Training Exercises

A major training exercise is comprised of several activities conducted by several units operating together while commanded and controlled by a single commander.

A.1.13.1 Rim of the Pacific Exercise

During RIMPAC, units conduct the PMRF-based terrestrial training components (amphibious operations, missile/rocket/target drone launches, artillery firing, C5ISRT) of the biennial multinational training exercise in which navies from Pacific Rim nations and other allies assemble to conduct training throughout the Hawaiian Islands in a number of warfare areas.

A.1.13.2 Large-Scale Amphibious Exercise

During large-scale amphibious exercises in the Hawaiian Islands, units conduct the terrestrial training component (e.g., amphibious operations) to secure the battlespace (air, land, and sea), maneuver to and seize the objective, and conduct self-sustaining operations ashore. This exercise may occur once in a two-year period, portions of which may use PMRF terrestrial areas.

Appendix B: Air Quality Calculations

Environmental Assessment
Pacific Missile Range Facility
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APPENDIX B Air Quality Calculations

B.1 Emission Estimates

B.1.1 Emissions from Vehicle Activities

Vehicle activities associated with the Proposed Action include those related to personnel commuting to the site as well as vehicle operations during the training and testing exercises. The emission estimates assumed there would be no additional fuel deliveries to Pacific Missile Range Facility (PMRF) to support activity increases associated with the Proposed Action. Emission factors, in grams per mile(g/m) from the Air Emissions Guide for Air Force Mobile Sources, Air Force Civil Engineer Center, June 2023, were used to estimate the combustion emissions from vehicles activities. Particulate matter (PM) less than or equal to 10 microns in diameter (PM_{10}) and PM less than or equal to 2.5 microns in diameter ($PM_{2.5}$) are also generated from vehicles activities on paved and unpaved roads. U.S. Environmental Protection Agency AP-42 methodologies were used to estimate the particulate matter emissions from vehicle travel on paved and unpaved roads. It was assumed that water spraying, or other dust suppressants would not be utilized.

Tables B-1 through B-7 present the emission factors and the estimated emissions from vehicle activities.

Table B-1: Assumptions used for Estimating Combustion Emissions from Military Vehicle Operations

Activity			Transport							
Site	Activity	Frequency	Vehicle	Category	Fuel	Number of Vehicles	Number of Miles/Day per activity/per vehicle	Number of Days per Activity	Number of activities per year	Total Miles
North Launch Area 1	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	15	12	3	5	2700
North Launch Area 1	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	60	1	3000
North Launch Area 1	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	10	28	14000
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	15	10	3	10	4500
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	15	10	40	1	6000
North Launch Area 2	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Annual	Light-Duty Diesel Vehicles (LDDV) – All diesel-powered passenger cars	On-Road Truck	Diesel	15	10	3	5	2250
North Launch Area 2	Artillery	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	6	10	4	2	480
North Launch Area 2	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	60	1	3000
North Launch Area 2	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	10	6	3000
South Launch Area	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	15	12	3	5	2700
South Launch Area	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	60	1	3000
South Launch Area	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	10	16	8000
MDA Hardstand	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	60	1	3000
MDA Hardstand	C5ISRT Exercise	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	5	10	10	7	3500
Waiapuaa Bay	Amphibious Operations - Raid	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	4	20	3	1	240
Forward Arming and Refueling Point (FARP)	FARP Operations	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	1	10	10	19	1900
Unmanned Aircraft System Launch Area	sUAS and UAS Operations	Annual	Heavy-Duty Diesel Vehicles (HDDV) – Diesel-powered vehicles (10,001 lbs. to > 60,000 lbs. GVWR)	On-Road Truck	Diesel	1	20	1	43	860

Reference for emission factors: Air Emissions Guide for Air Force Mobile Sources, Air Force Civil Engineer Center, June 2023; Tables 5-20 and 5-25

The Joint Light Tactical Vehicle (JLTV) weighs between 14,000 and 15,639 pounds, depending on the variant and equipment.
The factory curb weight is 16,000 pounds, but when fully equipped, it can weigh up to 21,000 pounds.
The Amphibious Combat Vehicle (ACV) has a gross vehicle weight of 35 tons (77,000 lbs) and a payload of 7,300 lbs.
Used the HDDV category for estimating JLTV and ACV Emissions.
Number of miles per day are per vehicle and per activity.

Table B-2: Emission Factors and Increase in Combustion Emissions from Military Vehicle Operations

Activity		Emissions Factors, grams per mile (g/mile)							Emissions, ton/year						Emissions, MT/year
Site	Activity	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
North Launch Area 1	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0048	0.0069	0.0003	0.00001	0.0001	0.0001	3.288
North Launch Area 1	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0053	0.0076	0.0003	0.00001	0.0001	0.0001	3.653
North Launch Area 1	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0248	0.0356	0.0015	0.00006	0.0007	0.0006	17.047
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0080	0.0114	0.0005	0.00002	0.0002	0.0002	5.479
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0106	0.0152	0.0007	0.00003	0.0003	0.0003	7.306
North Launch Area 2	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0040	0.0057	0.0002	0.00001	0.0001	0.0001	2.740
North Launch Area 2	Artillery	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0009	0.0012	0.0001	0.00000	0.0000	0.0000	0.584
North Launch Area 2	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0053	0.0076	0.0003	0.00001	0.0001	0.0001	3.653
North Launch Area 2	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0053	0.0076	0.0003	0.00001	0.0001	0.0001	3.653
South Launch Area	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0048	0.0069	0.0003	0.00001	0.0001	0.0001	3.288
South Launch Area	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0053	0.0076	0.0003	0.00001	0.0001	0.0001	3.653
South Launch Area	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0142	0.0203	0.0009	0.00004	0.0004	0.0004	9.741
MDA Hardstand	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0053	0.0076	0.0003	0.00001	0.0001	0.0001	3.653
MDA Hardstand	C5ISRT Exercise	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0062	0.0089	0.0004	0.00002	0.0002	0.0002	4.262
Waiapuaa Bay	Amphibious Operations - Raid	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0004	0.0006	0.0000	0.00000	0.0000	0.0000	0.292
Forward Arming and Refueling Point (FARP)	FARP Operations	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0034	0.0048	0.0002	0.00001	0.0001	0.0001	2.313
Unmanned Aircraft System Launch Area	sUAS and UAS Operations	1.61	2.30	0.10	0.00	0.04	0.04	1217.63	0.0015	0.0022	0.0001	0.00000	0.0000	0.0000	1.047

Table B-3: Methodology for Calculating PM Emissions from Military Vehicle Operations on Unpaved Roads

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a (W/3)^b \qquad (1a)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)

Reference: AP-42 (13.2.2), November 2006, https://www.epa.gov/sites/production/files/2020-10/documents/13.2.2_unpaved_roads.pdf

Pollutant	PM_{10}	$PM_{2.5}$	
k	1.5	0.15	AP-42, Table 13.2.2-2
s	25.2	25.2	AP-42, Table 13.2.2-3
a	0.9	0.9	AP-42, Table 13.2.2-2
b	0.45	0.45	AP-42, Table 13.2.2-2
S	25	25	
W-empty, tons	8	8	The JLTV weighs between 14,000 and 15,639 pounds, depending on the variant and equipment. The factory curb weight is 16,000 pounds, but when fully equipped, it can weigh up to 21,000 pounds.
W-full, tons	11	11	
e	0	0	

Assumed no control efficiency (water spray or other controls).

Table B-4: Increase in PM Emissions from Military Vehicle Operations on Unpaved Roads

Site	VMT, total	PM_{10}, ton/year	$PM_{2.5}$, ton/year
North Launch Area 1	19700	48.4	4.8
North Launch Area 2	19230	47.2	4.7
South Launch Area	13700	33.7	3.4
MDA Hardstand	6500	16.0	1.6
Waiapuaa (Major's) Bay	240	0.6	0.1
Forward Arming and Refueling Point (FARP)	1900	4.7	0.5
Unmanned Aircraft System Launch Area	860	2.1	0.2

Table B-5: Assumptions and Increase in Combustion Emissions from Personnel Travel to the Sites

Site	Transport				Emissions Factors, grams per mile (g/mile)							Emissions, ton/year						Emissions, MT/year
	Vehicle	Category	Fuel	Total Miles	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CO	NO_x	VOC	SO_x	PM_{10}	$PM_{2.5}$	CO_2
North Launch Area 1	All POV	On-Road Passenger Car	Composite	710000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	3.420	0.180	0.250	0.002	0.005	0.005	285
North Launch Area 2	All POV	On-Road Passenger Car	Composite	896400	4.37	0.23	0.32	0.003	0.01	0.01	401.00	4.318	0.227	0.316	0.003	0.007	0.006	359
South Launch Area	All POV	On-Road Passenger Car	Composite	470000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	2.264	0.119	0.166	0.002	0.004	0.003	188
Palai Olani	All POV	On-Road Passenger Car	Composite	313200	4.37	0.23	0.32	0.003	0.01	0.01	401.00	1.509	0.079	0.110	0.001	0.002	0.002	126
Waiapuaa Bay	All POV	On-Road Passenger Car	Composite	7800	4.37	0.23	0.32	0.003	0.01	0.01	401.00	0.038	0.002	0.003	0.000	0.000	0.000	3
Missile Defense Agency Hard Stand	All POV	On-Road Passenger Car	Composite	440000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	2.119	0.112	0.155	0.001	0.003	0.003	176
Airfield Bivouac Area	All POV	On-Road Passenger Car	Composite	1260000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	6.069	0.319	0.444	0.004	0.010	0.008	505
Alternate Bivouac Area	All POV	On-Road Passenger Car	Composite	60000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	0.289	0.015	0.021	0.000	0.000	0.000	24
Forward Arming and Refueling Point Areas	All POV	On-Road Passenger Car	Composite	57000	4.37	0.23	0.32	0.003	0.01	0.01	401.00	0.275	0.014	0.020	0.000	0.000	0.000	23
Unmanned Aircraft System Launch Area	All POV	On-Road Passenger Car	Composite	12900	4.37	0.23	0.32	0.003	0.01	0.01	401.00	0.062	0.003	0.005	0.000	0.000	0.000	5
Ground Maneuver Area	All POV	On-Road Passenger Car	Composite	16800	4.37	0.23	0.32	0.003	0.01	0.01	401.00	0.081	0.004	0.006	0.000	0.000	0.000	7
Reference for emission factors: Air Emissions Guide for Air Force Mobile Sources, Air Force Civil Engineer Center, June 2023; Table 5-11														1.50				**1,702**

Table B-6: Methodology for Calculating PM Emissions from Personnel Vehicle Operations on Paved Roads

$Ea = (VMT)[(k)(sL)^{0.91}(W)^{1.02}](Ci)(1 - e)$			
	PM_{10}	$PM_{2.5}$	
k	0.0022	0.00054	Default value, AP-42 Table 13.2.1-1
sL	0.6	0.6	AP-42 Table 13.2.1-2 - default for Average Daily Traffic (ADT) <500
W-full, tons	2	2	Average weight of passenger cars
W-empty, tons	2	2	Average weight of passenger cars
e			Assumed no control efficiency (water spray or other controls).

13.2.1.3 Predictive Emission Factor Equations[10,29]

The quantity of particulate emissions from resuspension of loose material on the road surface due to vehicle travel on a dry paved road may be estimated using the following empirical expression:

$$E = k\,(sL)^{0.91} \times (W)^{1.02} \qquad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

Table 13.2.1-1. PARTICLE SIZE MULTIPLIERS FOR PAVED ROAD EQUATION

Size range[a]	Particle Size Multiplier k[b]		
	g/VKT	g/VMT	lb/VMT
PM-2.5[c]	0.15	0.25	0.00054
PM-10	0.62	1.00	0.0022
PM-15	0.77	1.23	0.0027
PM-30[d]	3.23	5.24	0.011

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.

[b] Units shown are grams per vehicle kilometer traveled (g/VKT), grams per vehicle mile traveled (g/VMT), and pounds per vehicle mile traveled (lb/VMT). The multiplier k includes unit conversions to produce emission factors in the units shown for the indicated size range from the mixed units required in Equation 1.

[c] The k-factors for $PM_{2.5}$ were based on the average $PM_{2.5}$:PM_{10} ratio of test runs in Reference 30.

[d] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

Table 13.2.1-2. Ubiquitous Silt Loading Default Values with Hot Spot Contributions from Anti-Skid Abrasives (g/m^2)

ADT Category	< 500	500-5,000	5,000-10,000	> 10,000
Ubiquitous Baseline g/m^2	0.6	0.2	0.06	0.03 0.015 limited access
Ubiquitous Winter Baseline Multiplier during months with frozen precipitation	X4	X3	X2	X1
Initial peak additive contribution from application of antiskid abrasive (g/m^2)	2	2	2	2
Days to return to baseline conditions (assume linear decay)	7	3	1	0.5

Table B-7: Estimated Increase in PM Emissions from Personnel Travel to the Sites on Paved Roads

Site	Activity	# personnel	RT miles	days per event	events per year	VMT, total	PM_{10}, ton/year	$PM_{2.5}$, ton/year
North Launch Area 1	Missile, Rocket, and Aerial Target Drone Launch	100	20	3	0	0	-	-
	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	100	20	3	5	30000	0.04	0.01
	C5ISRT Exercise	100	20	60	1	120000	0.2	0.04
	C5ISRT Exercise	100	20	10	28	560000	0.8	0.19
North Launch Area 1 - Total						**710,000**	**1.0**	**0.2**
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	100	20	3	10	60000	0.1	0.02
	Missile, Rocket, and Aerial Target Drone Launch	100	20	40	1	80000	0.1	0.03
	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	100	20	3	5	30000	0.04	0.01
	Artillery	40	20	4	2	6400	0.01	0.002
	C5ISRT Exercise	100	20	60	1	120000	0.2	0.04
	C5ISRT Exercise	100	20	10	6	120000	0.2	0.0
	Bivouac	300	20	10	8	480000	0.7	0.2
North Launch Area 2 - Total						**896,400**	**1.3**	**0.3**
South Launch Area	Missile, Rocket, and Aerial Target Drone Launch	100	20	3	2	12000	0.02	0.004
	Missile, Rocket, and Aerial Target Drone Launch	100	20	40	1	80000	0.11	0.028
	Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	100	20	3	5	30000	0.04	0.01
	C5ISRT Exercise	100	20	60	1	120000	0.2	0.04
	C5ISRT Exercise	100	20	10	16	320000	0.4	0.1
South Launch Area - Total						**562,000**	**0.8**	**0.2**
Palai Olani	Parachute Operations (Personnel Insertion)	15	20	1	15	4500	0.006	0.002
	Bivouac (unit, medium, large)	300	20	10	5	300000	0.420	0.103
	Helicopter/Tilt-Rotor Landing Zone (LZ) Operations (off airport surface)	15	20	1	11	3300	0.005	0.001
	Amphibious Operations - Small Boat Operations	15	20	1	17	5100	0.0071	0.0018
	Amphibious Operations - Swimmer Insertion/Extraction)	15	20	1	1	300	0.0004	0.0001
Palai Olani - Total						**313,200**	**0.4**	**0.1**
Waiapuaa Bay	Amphibious Operations - Raid	40	20	3	1	2400	0.003	0.001
	Amphibious Operations - Small Boat Operations	15	20	1	17	5100	0.007	0.002
	Amphibious Operations - Swimmer Insertion/Extraction)	15	20	1	1	300	0.0004	0.0001
Waiapuaa Bay - Total						**7,800**	**0.0**	**0.0**
Missile Defense Agency Hard Stand	C5ISRT Exercise	100	20	60	1	120000	0.168	0.041
	C5ISRT Exercise	100	20	10	7	140000	0.196	0.048
	Bivouac (unit, medium, large)	300	20	10	3	180000	0.252	0.062
MDA Hard Stand - Total						**440,000**	**0.6**	**0.2**
Airfield Bivouac Area	Bivouac (unit, medium, large)	300	20	10	21	1260000	1.8	0.4
Alternate Bivouac Area	Bivouac (unit, medium, large)	300	20	10	1	60000	0.1	0.02
Forward Arming and Refueling Point Areas	Forward Arming and Refueling Point (FARP) Operations	15	20	10	19	57000	0.1	0.02
Unmanned Aircraft System Launch Area	Small Unmanned Aircraft Systems (sUAS) and Counter-Unmanned Aircraft Systems (UAS) Operations	15	20	1	43	12900	0.02	0.004
Ground Maneuver Area	Ground maneuver	40	20	1	21	16800	0.02	0.01

B.1.2 Emissions from Munitions Activities

Available emissions factors (AP-42, *Compilation of Air Pollutant Emission Factors*) or other published sources were used to estimate the emissions. These factors were then multiplied by the net weight of the explosive and the number of items that were used per year. This calculation provides estimates of annual emissions.

$$Emissions = EXP/YR \times EF$$

Where:

Emissions = annual ordnance emissions

EXP/YR = number of explosives, propellants, and pyrotechnics items used per year

EF = air pollutant emissions factor per item

Table B-8 and Table B-9 present the emission factors, references, and the estimated emissions from munition activities.

Table B-8: Munitions Emission Factors and References

Munitions Information				Emission Factor (lb/lb NEW)								Emission Factor (lb/item)						
Munition Type	Munition	Component	Net Explosive Weight (lb NEW)	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2	CO_2	Reference	Emission Factor Assumptions and Comments	CO	NO_x	VOC	PM_{10}	$PM_{2.5}$	SO_2	CO_2
BOMB	MK82 INERT	spotting charge	3							Hawaii-Southern California Training and Testing Final EIS/OEIS, October 2018	Assume Spotting Charge	0.26						
LRG PROJ	155MM ILL		6							AP-42 Chapter 15, Table 15.4.1-1 EMISSION FACTORS FOR THE USE OF DODIC D505, M485A2 155-MM ILLUMINATION ROUND (PROJECTILE)		0.026	0.094	0.0015	3		0.0027	1.8
MED PROJ	30MM		0.03							AP 42, Chapter 15, Table 15.2.1-1 EMISSION FACTORS FOR THE USE OF DODIC B129, M789 30-MM HIGH EXPLOSIVE DUAL PURPOSE		8.60E-04	2.00E-04		3.90E-03	2.50E-03	0.00E+00	4.40E-03
SMOKE POT	ABC-M5 30-POUND HC SMOKE POT		1.10	2.50E-02	8.40E-05	1.00E+00	5.60E-01	1.40E-04	1.50E-02	AP 42, Chapter 15, Table 15.7.6-1, EMISSION FACTORS FOR THE USE OF DODIC K866, ABC-M5 30-POUND HC SMOKE POT	Net Explosive Weight for Smokey Sam is from Hazard Classification of United States Military Explosives and Munitions, Revision 15, June 2012	0.0275	0.0000924	0.000594	1.1	0.616	0.000154	0.0165
MISSILE	AGM-84		215	0.021	6.30E-03	2.10E-02	1.50E-02	1.20E-04	6.30E-01	AP 42, Chapter 15, Table 15.9.1-1, DODIC M023, M112 Demolition Block Charge	Assume similar to C-4 emissions. Net Explosive Weight for AGM -84 is from Hazard Classification of United States Military Explosives and Munitions, Revision 15, June 2012	4.515	1.3545		4.515	3.225	0.0258	135.45
Rocket	2.75" RKT Inert	INERT Warhead	Neg.	5.60E-02	7.10E-03	6.10E-02	3.80E-02			Hawaii-Southern California Training and Testing Final EIS/OEIS, October		Negligible emissions						

Table B-9: Estimated Increase in Munitions Emissions

Site	Activity	Munition Type	Number per Activity	Activity/Year	Total items per year	Emissions Factors in tons/Year						
						NO_x	SO_x	CO	VOC	PM_{10}	$PM_{2.5}$	CO_2e (MT/year)
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	Missile	17	10	170	0.1151325	0.002193	0.383775		0.38	0.27	10.445
North Launch Area 2	Missile, Rocket, and Aerial Target Drone Launch	Smokey Sam Launches			400	1.848E-05	3.08E-05	0.0055	0.000003	0.22	0.1232	0.003
North Launch Area 2	Artillery	155-millimeter (mm) projectiles	300	2	600	0.0282	0.00081	0.0078	0.00045	0.90	0.00	0.490
South Launch Area	Missile, Rocket, and Aerial Target Drone Launch	Missile	17	2	34	0.0230265	0.000439	0.076755		0.08	0.05	2.089
Kaula Island	Air-to-Ground Gunnery Exercise (GUNEX)	30 mm projectiles	800	10	8000	0.0008	0.0000	0.0034		0.02	0.01	0.02
Kaula Island	Air-to-Ground Gunnery Exercise (GUNEX)	Inert 2.75-inch Rockets										
Kaula Island	Air-to-Ground Bombing Exercise (BOMBEX)	Inert Bomb	1	19	19			0.00247				

B.1.3 Emissions from Vessel Activities

Landing Craft Air-Cushioned (LCAC) emissions were estimated using the Microsoft Access-based Navy and MSC Engine Emissions Calculator, Version April 2024 (Naval Sea Systems Command, 2024). Combat Rubber Raiding Craft (CRRC) emissions were based on the information in the Atlantic Fleet Training and Testing Final EIS/OEIS, September 2018.

Tables B-10 and B-11 and Figure B-1 present the emission factors and estimated increase in vessels emissions.

Table B-10: Vessel Emission Factors and References

Ship/Boat Type	Acronym	Vessel Total Emissions, lb/hour							EF Reference
		NO_x	SO_x	CO	VOC	PM_{10}	$PM_{2.5}$	CO_2	
Landing Craft Air-Cushioned	LCAC	114.64	0.00	17.64	4.41	2.20	2.20	20693	Navy and MSC Marine Engine Fuel Consumption and Emission Calculator (see screenshot)
Combat Rubber Raiding Craft	CRRC	0.9538	0.0005	0.02242	0.0128	0.0289	0.0289	87.23	Atlantic Fleet Training and Testing Final EIS/OEIS, September 2018

EIS

Tab I Table 1. Ship and Boat Emission Factors (continued)

Ship/Boat Type	Acronym	Emissions Factors (lb/hr) Propulsion Engines + Generators						Engine model[1]	Engines	Use[1]
		HC	CO	NO_x	SO_x	$PM_{10/2.5}$	CO^2			
Landing Craft Air Cushion	LCAC	0.35	1.23	2.93	0.38	0.25	668	T-62T-60-7	2	80 HP
								TF40B	4	3955 HP
Landing Craft Utility	LCU/LCM	0.52	36.21	44.95	3.11	1.57	1,683.91	2- Detroit 12V-71 Diesel engines, twin shaft, 680 hp sustained, used for both LCU and LCM data		
Amphibious Assault Vehicle	AAV-2	0.82	0.76	6.22	1.25	0.26		Detroit Diesel 8V-53T (P-7), Cummins VT 400 903 (P-7A1)		
Mark V	MK V	6.85	27.20	84.43	10.96	3.81	5,395	2x 2285 HP MTU 12V396 TE94 engines		
Rigid Inflatable Boat (zodiac)	RIB-4	0.06	0.34	9.14	1.44	0.15	1,163.88	Dual Caterpillar 3126 DITA, 6 in-line cylinder diesel, turbocharged, aftercooled.		470 HP x2
Combat Rubber Raiding Craft	CRRC	0.0128	0.2242	0.9538	0.0005	0.0289	87.23	55	HP 2-stroke engine	gas diesel EFs for small craft
High Speed Maneuverable Surface Target	HSMST	203.98	496.660	7.100	0.200	0.300	466.84	200	HP - 2 Mercury Optimax outboards	24.6 lb/hr fuel use jp-5
River Command Boat	RCB	1.12	2.81	27.40	4.08	0.66	1591	850	HP X 2	43.5 lb/hr fuel use diesel
River Assault Boat	RAB	0.58	1.46	14.18	2.11	0.34	838	440	HP X 2	22.9 lb/hr fuel use diesel
River Patrol Boat	RPB	0.58	1.46	14.18	2.11	0.34	838	440	HP X 2	22.9 lb/hr fuel use diesel
SEAARK	PB	0.56	1.39	13.54	2.02	0.33	739	420	HP X 2	20.2 lb/hr fuel use

F470 = CRRC

[1] Data from Navy and MSC Marine Engine Fuel Consumption & Emissions Calculator, US Navy, October 2016

U.S. Navy Vessel Emission Data

Generated on 05/27/2024 at 07:04:19 PM

by Navy and MSC Marine Engine Fuel Consumption and Emission Calculator

Vessel Set Totals

	kg NOx	kg SOx	kg CO	kg CO2	kg HC	kg PM
All Crafts Total	52	0	8	9,386	2	1

	kg NOx	kg SOx	kg CO	kg CO2	kg HC	kg PM
All Boat Total	0	0	0	0	0	0

	kg NOx	kg SOx	kg CO	kg CO2	kg HC	kg PM
All Vessel Set Total	52	0	8	9,386	2	1

Vessel 1 of 1

Craft LCAC 75 **Type** LCAC **Propulsion** Gas Turbine

Description

Name LANDING CRAFT, AIR CUSHION **Status** Active **Tycom** PS **OpSponsor** N85

Service US Navy **SLM** 377, 307H **UIC** 21969

DecommDate **PeraCode** S/S SDO

Homeport Camp Pendleton, CA **PlanYard** Puget Sound (DET) Boston, Boston, MA **Command** Assault Craft Unit Five

Engine: T-62T-40-7 **HP:** 80 **Cycles:** **Use:** SSGTG **No Engines:** 2

Engine: TF40B **HP:** 3955 **Cycles:** **Use:** MPGT **No Engines:** 4

Analysis Parameters

Hrs Underway 1 **Fuel Sulfur %** 0.0015

Analysis Results

Engine Model	HP	Cycles	Use	No. Eng	GPH/Engine	kg NOx	kg SOx	kg CO	kg CO2	kg HC	kg PM
T-62T-40-7	80		SSGTG	2	14.6	1	0	1	303	0	0
TF40B	3955		MPGT	4	219	51	0	8	9,084	1	1
Vessel Total						52	0	8	9,386	2	1

Figure B-1: Vessel Emission Factors

Table B-11: Estimated Increase in Vessel Emissions

Site	Activity	Number of Vessels	Number of Training Hours per day (within 3 NM)	Number of Days per Event	Number of Events per year	Total hours per year	Total Pounds per Year							
							NOx	SOx	CO	VOC	HAPs	PM10	PM2.5	CO2e
Palai Olani	Amphibious Operations - Small Boat Operations	4	8	1	17	544	518.87	0.27	121.96	6.96		15.72	15.72	47,453
Waiapuaa Bay	Amphibious Operations - Raid	4	2	3	1	24	2,751.37	-	423.29	105.82		52.91	52.91	496,622
Waiapuaa Bay	Amphibious Operations - Small Boat Operations	4	8	1	17	544	518.87	0.27	121.96	6.96		15.72	15.72	47,453

		Total tons per Year							
		NOx	SOx	CO	VOC	HAPs	PM10	PM2.5	CO2e (MT)
Palai Olani	Amphibious Operations - Small Boat Operations	0.26	0.00	0.06	0.00	-	0.01	0.01	22
Waiapuaa Bay	Amphibious Operations - Raid	1.38	-	0.21	0.05	-	0.03	0.03	225
Waiapuaa Bay	Amphibious Operations - Small Boat Operations	0.26	0.00	0.06	0.00	-	0.01	0.01	22
					0.06			0.04	**268**

B.1.4 Generator Emissions

Emissions were estimated for 2-kilowatt Mobile Electric Power (MEP)-531A and the 60-kilowatt MEP-1070 Military Diesel Generators. Table B-12, Table B-13, and Table B-14 present the estimated daily emissions for each type of generator and the total increase in generator emissions for each site.

Table B-12: Estimated Emissions – MEP-531A

Engine Specifications - Yanmar L48AE-DEG Diesel engine						
Tier	2					
Horsepower	4.2					
Generator Rating, Kw	2					
kW (engine)	2.2	The generator kW and the engine kW in a generator set are related but not directly equal due to several factors including mechanical and electrical efficiencies. Used an efficiency of 90% to convert generator kW to engine kW.				
Fuel Consumption (gal/hr)	0.33	**From equipment specification**				
Number of Engines	1					
KW to HP	0.7457	kw/hp				
g to lbs	453.592	grams/lb				
Days per year						
Hours per day	24					
Pollutants	**Emission Factor (g/kW-hr)**	**Total Hourly Emissions (lbs)**	**Total Daily Emissions (lbs)**			
NOx	7.1250	0.0349	0.84			
CO	8.0000	0.0392	0.94			
HC	0.3750	0.0018	0.04			
PM	0.8000	0.0039	0.09			
SOx	-	0.0236	0.57			
Emissions are based on Tier 2 Standards - see screenshot						
Equations:						
Pollutant hourly emissions (lb/h	**Emission Factor (g/bhp-hr)*engine horsepower (hp)/453.592(g/lb)**					
Reference for % NOx and HC in NOx+NMHC: Bay Area AQMD Policy, June 28, 2004, CARB Emission Factors for CI Diesel Engines – Percent HC in Relation to NMHC + NOx (https://www.baaqmd.gov/~/media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx)						
Sulfur content						
0.5%	by mass	Diesel	Maximum allowable fuel sulfure content: §11-60.1-38 Sulfur oxides from fuel combustion.			
0.33	Fuel Consumption (gal/hr)					
7.10	Fuel density, lb/gal					
0.0236	lb/hr of SOx	Per engine				
22.58	lb CO_2e/gal diesel	See Tab "GHG Emission Factors"				
180.49	lb CO_2e/day					

Table B-13: Estimated Emissions – MEP-1070

MEP-1070						
Engine Specifications - Cummins QSB4.5 Tier III						
Tier	3					
Horsepower	109					
Generator Rating, Kw	60					
kW (engine)	66.7	The generator kW and the engine kW in a generator set are related but not directly equal due to several factors including mechanical and electrical efficiencies. Used an efficiency of 90% to convert generator kW to engine kW.				
Fuel Consumption (gal/hr)	3.00	See equipment specification https://www.marcorsyscom.marines.mil/Portals/105/PfM/LCES/ES/Power%20Team/Mobile%20Power/Info%20Sheets/GENERATORSET60KW60HZAMMPSSKIDMOUNTED.pdf?ver=2018-11-13-150411-423				
Number of Engines	1					
KW to HP	0.7457	kw/hr				
g to lbs	453.592	grams/lb				
Days per year						
Hours per day	24					
Pollutants	**Emission Factor (g/kW-hr)**	**Total Hourly Emissions (lbs)**	**Total Daily Emissions (lbs)**			
NOx	3.8000	0.5585	13.40			
CO	5.0000	0.7349	17.64			
HC	0.2000	0.0294	0.71			
PM	0.3000	0.0441	1.06			
SOx	-	0.2130	5.11			
Equations:						
Pollutant hourly emissions (lb/h	**Emission Factor (g/bhp-hr)*engine horsepower (hp)/453.592(g/lb)**					
Reference for % NOx and HC in NOx+NMHC: Bay Area AQMD Policy, June 28, 2004, CARB Emission Factors for CI Diesel Engines – Percent HC in Relation to NMHC + NOx (https://www.baaqmd.gov/~/media/Files/Engineering/policy_and_procedures/Engines/EmissionFactorsforDieselEngines.ashx)						
Sulfur content						
0.5%	by mass	Diesel	Maximum allowable fuel sulfure content: §11-60.1-38 Sulfur oxides from fuel combustion.			
3.00	Fuel Consumption (gal/hr)					
7.10	Fuel density, lb/gal					
0.2130	lb/hr of SOx	Per engine				
22.58	lb CO_2e/gal diesel	See Tab "GHG Emission Factors"				
1626	lb CO_2e/day					

Table B-14: Estimated Increase in Generator Emissions for Each Site

Site/Activity	Number of Generator	Number of Days per Activity	Number of Activities per year	Total Generator Emissions, Ton/yr						CO_2 emissions, MT/year	Annual Fuel Consumption, gal/year
				NO_x	SO_x	CO	VOC	PM_{10}	$PM_{2.5}$		
North Launch Area 1 - Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	2	3	5	0.20	0.08	0.26	0.01	0.02	0.02	22	2160
North Launch Area 1 - C5ISRT Exercise	3	60	1	1.21	0.46	1.59	0.06	0.10	0.10	133	12960
North Launch Area 1 - C5ISRT Exercise	3	10	28	5.63	2.15	7.41	0.30	0.44	0.44	620	60480
North Launch Area 2 - Missile, Rocket, and Aerial Target Drone Launch	3	3	10	0.60	0.23	0.79	0.03	0.05	0.05	66	6480
North Launch Area 2 - Missile, Rocket, and Aerial Target Drone Launch	3	40	1	0.80	0.31	1.06	0.04	0.06	0.06	89	8640
North Launch Area 2 - Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	2	3	5	0.20	0.08	0.26	0.01	0.02	0.02	22	2160
North Launch Area 2 - C5ISRT Exercise	3	60	1	1.21	0.46	1.59	0.06	0.10	0.10	133	12960
North Launch Area 2 - C5ISRT Exercise	3	10	6	1.21	0.46	1.59	0.06	0.10	0.10	133	12960
North Launch Area 2 - Bivouac (unit, medium, large)	2	10	8	0.07	0.05	0.08	0.00	0.01	0.01	13	1279
South Launch Area - Missile, Rocket, and Aerial Drone Target Set-up (No Launch)	2	3	5	0.20	0.08	0.26	0.01	0.02	0.02	22	2160
South Launch Area - C5ISRT Exercise	3	60	1	1.21	0.46	1.59	0.06	0.10	0.10	133	12960
South Launch Area - C5ISRT Exercise	3	10	16	3.22	1.23	4.23	0.17	0.25	0.25	354	34560
Palai Olani - Bivouac (unit, medium, large)	2	10	5	0.67	0.26	0.88	0.04	0.05	0.05	74	7200
MDA Hard Stand - C5ISRT Exercise	3	60	1	1.21	0.46	1.59	0.06	0.10	0.10	133	12960
MDA Hard Stand - C5ISRT Exercise	3	10	7	1.41	0.54	1.85	0.07	0.11	0.11	155	15120
MDA Hard Stand - Bivouac (unit, medium, large)	2	10	3	0.03	0.02	0.03	0.00	0.00	0.00	5	480
Airfield Bivouac Area - Bivouac (unit, medium, large)	2	10	21	0.18	0.12	0.20	0.01	0.02	0.02	34	3357
Alternate Bivouac Area - Bivouac (unit, medium, large)	2	10	1	0.01	0.01	0.01	0.00	0.00	0.00	2	160
Forward Arming and Refueling Point Areas	1	10	19	0.08	0.05	0.09	0.00	0.01	0.01	16	1518
Unmanned Aircraft System Launch Area	1	10	43	0.18	0.12	0.20	0.01	0.02	0.02	35	3437
Total				**19.50**	**7.60**	**25.56**	**1.03**	**1.56**	**1.56**	**2,192**	**213,990**

B.1.5 Aircraft Emissions

The increase in fixed-wing and rotary aircraft emissions were estimated for Forward Arming and Refueling Point, Helicopter/Tilt-Rotor Landing Zone operations, and Air-to-Ground Gunnery and Bombing Exercises. Emission factors for most military engines were obtained from the Navy's Aircraft Environmental Support Office memoranda. For those aircraft for which engine data were unavailable from Aircraft Environmental Support Office, emission factors from Air Emissions Guide for Air Force Mobile Source, June 2023, were used. Tables B-15 through B-19 present the aircraft assumptions for the air quality analysis, aircraft emission factors, and increase in aircraft emissions for each operation.

Table B-15: Aircraft Operational Assumptions

Service	Annual of FARP Exercises	Total FARP Exercise Duration (days)	Aircraft Type	Number of aircraft refueled (by type, per day)	Refueling Duration per single aircraft (hours)	Annual Hours Spent with Engines on Refueling at FARP		Annual Landings Associated with FARP Activities	Annual Takeoffs Associated with FARP Activities
Navy	3	1	P-8	2	0.5	12		6	6
			FA-18/F-35	8	0.5	12		24	24
Marine Corps	4	5	KC-130	1	0.5	10		20	20
			MV-22B	40	0.4	320		800	800
Army	9	2	CH-47	1	0.5	9		18	18
			AH-64	16	0.5	144		288	288
Air Force	4	2	Tanker	1	0.5	4		8	8
			Fighter	8	0.5	32		64	64
						543		1228	1228

Notes:
1. FARP operations per DoD Handbook Aircraft Refueling Handbook for Navy/Marine Corps Aircraft (MIL-HDBK-844A(AS) 30 Dec 2003 and specific aircraft NATOPS
2. FARP location for planning: N22.038/W159.782
3. Assume 2 aircraft refueling at any one time.

PMRF LBT EA Landing Zone Operations (LZ Fire Pit) Assumptions for AQ and Noise Impacts Assessment

Service	Annual of LZ Exercises	Total LZ Exercise Duration (days)	Aircraft Type	Number of aircraft using LZ (by type, per day)	LZ Use Duration per single aircraft (hours)	Annual Hours Spent with Engines on, at (on deck) or above (sling load hover) LZ Fire Pit		Annual Landings Associated with LZ Fire Pit Activities	Annual Takeoffs Associated with LZ Fire Pit Activities
Marine Corps	4	2	MV-22B	4	0.4	12.8		32	32
Army	6	2	CH-47	4	0.4	19.2		48	48
						32		80	80

Notes:
1. LZ Fire Pit operations per MCWP 3-11.4 Helicopterborne Operations and MCRP 4-11.3E, Multiservice Helicopter Sling Load
2. LZ Fire Pit location (center) N22.046/W159.799
3. Assume 1 aircraft in the LZ at any one time.

Table B-16: Aircraft Emission Factors

Aircraft Engine Emissions Indices/Factors and Sources

General information							Emissions Factors (lb/operation)							References
Aircraft	Engine Model	Engines (#)	Fuel Flow (lb/hr) /Engine	Fuel Flow (lb/operation)	Fuel Flow (gal/operation)	Mode	CO	NOx	VOC	SOx	$PM_{2.5}$	PM_{10}	CO_2	Source of Emissions Indices Information
P-8	CFM56-7B27 (2)	2		4672	687	Single P-8 LTO with Straight In Arrival	21.58	68.57	2.44	1.73	1.10	1.10	14,770	AESO Memorandum Report No. 2017-09 April 2017, Table 1
P-8	CFM56-7B27 (2)	2		921	135	Idle (for 30 minutes per refueling operation)	16.49	4.42	1.80	0.34	0.06	0.06	2,911	AESO Memorandum Report No. 2017-09 April 2017, Table 1
FA-18E/F	F414-GE-400 (2)	2		2612	384	Single F/A-18E/F LTO with Straight In Arrival	265.30	31.08	80.16	0.97	18.21	18.21	7,824	AESO Memorandum Report No. 9815 I, June 2017, Table 5
FA-18E/F	F414-GE-400 (2)	2		696	102	Idle (for 30 minutes per refueling operation)	68.33	2.21	52.29	0.26	8.80	8.80	2,069	AESO Memorandum Report No. 9815 I, June 2017, Table 5
FA-18E/F	F414-GE-400 (2)	2		696	102	Approach (used for estimating GHG for	68.33	2.21	52.29	0.26	8.80	8.80	2,069	AESO Memorandum Report No. 9815 I, June 2017, Table 5
KC-130	T56-A-16	4				Single KC-130 LTO	4.97	14.20	1.29	1.83	1.02	1.13	5,497	ACAM Model, one LTO for one Aircraft, No maintenance emissions included
KC-130	T56-A-16	4		1512	222	Idle (for 30 minutes per refueling operation)	8.54	9.60	2.12	0.56	1.13	1.25	4,861	Air Emissions Guide for Air Force Mobile Sources, June 2023, Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants , Table 2-3. GHG Emission Factors for Aircraft Engines
MV-22B	T406-AD-400 (2)	2		1577	232	Vertical Takeoff (Conversion mode) + Landing w/Break (Airplane mode)	5.52	12.92	0.09	0.58	2.17	2.17	5,078	AESO Memorandum Report No. 9946 Revision G May 2017, Table ES-1 VOC = THC x 1.16 x 1.15
MV-22B	T406-AD-400 (2)	2		288	42	Idle (for 0.4 hour per refueling operation)	2.56	1.18	0.04	0.11	0.45	0.45	928	AESO Memorandum Report No. 9946 Revision G May 2017, Table 1 VOC = THC x 1.16 x 1.15
CH-47 (modeled as H-46)	T58-GE-16 (2)	2		366	54	Single H-46 LTO	21.37	1.07	7.83	0.14	1.36	1.36	1,131	AESO Memorandum Report No. 9816 Revision G December 2015, Table 1
CH-47 (modeled as H-46)	T58-GE-16 (2)	2		167	25	Idle (for 30 minutes per refueling operation)	20.26	0.25	8.76	0.06	0.85	0.85	487	AESO Memorandum Report No. 9816 Revision G December 2015, Table 1
CH-47 (modeled as H-46)	T58-GE-16 (2)	2		630	93	Hover (for one hours for GUNEX)	9.68	2.68	1.56	0.23	1.12	1.12	2,005	AESO Memorandum Report No. 9816 Revision G December 2015, Table 1
AH-64 (modeled as H-60)	T700-GE-401C (2)	2		661	97	Single H-60 LTO	12.31	3.36	1.58	0.24	2.34	2.34	2,110	AESO Memorandum Report No. 9929 Revision D December 2019 , Table S-1
AH-64 (modeled as H-60)	T700-GE-700 (2)	2		134	20	Idle (for 30 minutes per refueling operation)	6.20	0.45	0.07	0.05	0.18	0.20	431	To match engine information, used Air Emissions Guide for Air Force Mobile Sources, June 2023, Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants , Table 2-3. GHG Emission Factors for Aircraft Engines
Air Force Tanker - Modeled as KC-135	J57-P-22	4				Single KC-135 LTO	90.30	15.93	91.32	3.06	2.30	2.56	9,200	ACAM Model, one LTO for one Aircraft, No maintenance emissions included
Air Force Tanker - Modeled as KC-135	J57-P-22	4		2174	320	Idle (for 30 minutes per refueling operation)	128.81	5.39	128.33	0.80	14.94	16.61	6,989	Air Emissions Guide for Air Force Mobile Sources, June 2023, Table 2-9. Aircraft Engine Emission Factors for Criteria Pollutants , Table 2-3. GHG Emission Factors for Aircraft Engines
Air Force Fighter - Modeled as FA-18E/F	F414-GE-400 (2)	2		2612	384	Single F/A-18E/F LTO with Straight In Arrival	265.30	31.08	80.16	0.97	18.21	18.21	7,824	AESO Memorandum Report No. 9815 I, June 2017, Table 5
Air Force Fighter - Modeled as FA-18E/F	F414-GE-400 (2)	2		696	102	Idle (for 30 minutes per refueling operation)	68.33	2.21	52.29	0.26	8.80	8.80	2,069	AESO Memorandum Report No. 9815 I, June 2017, Table 5

Table B-17: Increase in Aircraft Emission - LZ Fire Pit

					Emissions (lb/operation)						
Aircraft	Annual of FARP Exercises	Total FARP Exercise Duration (days)	Annual LTOs	Number of aircraft refueled (by type, per day)	**CO**	**NOx**	**VOC**	**SOx**	**$PM_{2.5}$**	**PM_{10}**	**CO_2**
MV-22B (LTO)	4	2	32	4	176.64	413.44	2.99	18.67	69.44	69.44	162,492
MV-22B (Operation)	4	2		4	82.0224	37.69344	1.23	3.41	14.47	14.47	29,685
CH-47 (modeled as H-46) (LTO)	6	2	48	4	1025.76	51.36	375.91	6.50	65.28	65.28	54,264
CH-47 (Operation)	6	2		4	972.3408	11.86368	420.27	2.97	40.56	40.56	23,383
				Total, lbs./year	2256.763	514.3571	800.3964	31.54768	189.7501	189.7501	269822.93
				Total, tons/year	1.13	0.26	0.40	0.02	0.09	0.09	
				MT/year							122

Table B-18: Increase in Aircraft Emission - FARP

					Emissions (lb/operation)						
Aircraft	Annual of FARP Exercises	Total FARP Exercise Duration (days)	Annual LTOs	Number of aircraft refueled (by type, per	**CO**	**NOx**	**VOC**	**SOx**	**$PM_{2.5}$**	**PM_{10}**	**CO_2**
P-8 (LTO)	3	1	6	2	129.48	411.42	14.63	10.37	6.60	6.60	88,618
P-8 (Refueling)	3	1		2	98.9154	26.5248	10.80	2.04	0.38	0.38	17,468
FA-18E/F (LTO)	3	1	24	8	6367.2	745.92	1923.72	23.19	437.04	437.04	187,776
FA-18E/F (Refueling)	3	1		8	1639.999	53.11872	1254.96	6.18	211.14	211.14	49,661
KC-130 (LTO)	4	5	20	1	99.36	284.08	25.80	36.60	20.32	22.52	109,944
KC-130 (Refueling)	4	5		1	170.856	192.024	42.34	11.19	22.68	25.10	97,211
MV-22B (LTO)	4	5	800	40	4416	10336	74.70	466.79	1736.00	1736.00	4,062,288
MV-22B (Refueling)	4	5		40	2050.56	942.336	30.74	85.25	361.73	361.73	742,118
CH-47 (modeled as H-46) (LTO)	9	2	18	1	384.66	19.26	140.97	2.44	24.48	24.48	20,349
CH-47 (modeled as H-46) (Refueling)	9	2		1	364.6278	4.44888	157.60	1.11	15.21	15.21	8,769
AH-64 (modeled as H-60) (LTO)	9	2	288	16	3545.28	967.68	453.74	70.44	673.92	673.92	607,579
AH-64 (Refueling)	9	2		16	1784.494	129.6691	19.30	14.28	51.33	57.12	124,059
Air Force Tanker - Modeled as KC-135 (LTO)	4	2	8	1	722.4	127.424	730.59	24.50	18.42	20.46	73,600
Air Force Tanker - Modeled as KC-135 (Refueling)	4	2		1	1030.476	43.13216	1026.65	6.44	119.48	132.87	55,909
Air Force Fighter - Modeled as FA-18E/F (LTO)	4	2	64	8	16979.2	1989.12	5129.92	61.85	1165.44	1165.44	500,735
Air Force Fighter - Modeled as FA-18E/F (Refueling)	4	2		8	4373.33	141.6499	3346.57	16.48	563.04	563.04	132,429
				Total, lbs./year	44156.84	16413.81	14383.03	839.1583	5427.195	5453.043	6878513.4
				Total, tons/year	22.08	8.21	7.19	0.42	2.71	2.73	
				MT/year							3,120

Table B-19: Increase in Aircraft Emission - Kaula Island

				Emissions (lb/operation)						
Aircraft	**Annual # of Air-to-Ground Gunnery Exercises (GUNEX)**	**Annual # of Air-to-Ground Bombing Exercise (BOMBEX)**	**Annual LTOs**	**CO**	**NOx**	**VOC**	**SOx**	**$PM_{2.5}$**	**PM_{10}**	**CO_2**
FA-18E/F (LTO)		19	19	5040.7	590.52	1522.95	18.36	345.99	345.99	148,656
CH-47 (modeled as H-46) (LTO)	10		10	213.7	10.7	78.32	1.35	13.60	13.60	11,305
CH-47 (modeled as H-46) (Hover for one hours for GUNEX)	10			96.831	26.775	15.6492	2.331	11.214	11.214	20,047
			Total, lbs./year	5351.23	628.00	1616.91	22.05	370.80	370.80	180,007
			Total, tons/year	2.68	0.31	0.81	0.01	0.19	0.19	
			MT/year							82

B.1.6 Estimated Emissions for the Proposed Action

Table B-20 presents the estimated emissions for each site. Table B-21 presents the estimated emissions for PMRF Barking Sands and Kaula Island. Table B-22 shows the estimated total Hazardous Air Pollutant Emissions for the Proposed Action.

Table B-20: Estimated Increase in Emissions by Site

Site/Emissions	Total Increase in Emissions, ton/year						CO_2e MT/year
	NO_x	SO_x	CO	VOC	PM_{10}	$PM_{2.5}$	
North Launch Area 1	7.27	2.69	12.71	0.62	49.95	5.64	1,083
North Launch Area 2	4.51	1.59	10.12	0.53	50.33	5.76	849
South Launch Area	4.78	1.77	8.37	0.41	34.68	3.90	714
Palai Olani	1.27	0.27	3.58	0.55	0.60	0.27	343
Waiapuaa Bay	1.64	0.00	0.31	0.06	0.63	0.10	250
Missile Defense Agency Hard Stand	2.77	1.02	5.60	0.29	16.80	1.96	477
Airfield Bivouac Area	0.50	0.12	6.27	0.45	1.80	0.46	540
Alternate Bivouac Area	0.02	0.01	0.30	0.02	0.09	0.02	26
Forward Arming and Refueling Point Areas	8.31	0.47	22.45	7.22	7.48	3.21	3,161
Unmanned Aircraft System Launch Area	0.19	0.12	0.27	0.01	2.15	0.24	41
Ground Maneuver Area	0.00	0.00	0.08	0.01	0.02	0.01	7
Kaula Island	0.315	0.01	2.68	0.81	0.201	0.20	111

Table B-21: Estimated Increase in Emissions for each Location

Site/Emissions	Total Increase in Emissions, ton/year						CO_2e MT/year
	NO_x	SO_x	CO	VOC	PM_{10}	$PM_{2.5}$	
PMRF Barking Sands	31.24	8.05	70.05	10.18	164.54	21.56	7,491
Kaula Island	0.31	0.011	2.68	0.81	0.20	0.20	111
Total	**31.55**	**8.06**	**72.73**	**10.99**	**164.74**	**21.76**	**7,602**

Table B-22: Estimated Total Increase in HAP Emissions for the Proposed Action

	Increase in HAP Emissions, Ton/yr						
Pollutant	**Aircraft**	**Vessel**	**Military Vehicle**	**POV**	**Generators**	**Total**	**Main Contributing Activity**
1,3 Butadiene	0.00007		0.00010	0.02156	0.00002	0.0218	Personnel Commute
2,2,4-Trimethylpentane		0.0000002	0.00028	0.06048	0.000000	0.0608	Personnel Commute
Acetaldehyde	0.00018	0.0000003	0.00011	0.02455	0.00008	0.0249	Personnel Commute
Acrolein	0.00010	0.0000001	0.00003	0.00599	0.00000	0.0061	Personnel Commute
Benzene	0.00007	0.0000001	0.00040	0.08818	0.00002	0.0887	Personnel Commute
Ethylbenzene	0.00001		0.00018	0.03832	0.00000	0.0385	Personnel Commute
Formaldehyde	0.00052	0.0000013	0.00023	0.05045	0.00019	0.0514	Personnel Commute
Hexane		0.0000001	0.00016	0.03593	0.00000	0.0361	Personnel Commute
Methanol	0.00008					0.00008	Aircraft
Naphthalene	0.00002	0.0000009	0.00000	0.00105	0.00000	0.0011	Personnel Commute
Phenol	0.00003					0.00003	Personnel Commute
Propanal	0.00003	0.0000000	0.00001	0.00165	0.00005	0.0017	Personnel Commute
Styrene	0.00001		0.00014	0.03054	0.00000	0.0307	Personnel Commute
Toluene	0.00003	0.0000001	0.00086	0.18743	0.00001	0.1883	Personnel Commute
Xylenes (Mixed Isomers)	0.00002	0.0000000	0.00069	0.15135	0.00000	0.1521	Personnel Commute

B.1.7 Receptors

Identification of receptors, including sensitive receptors, is important to the air quality impact analysis. Sensitive receptors are individuals in hospitals, schools, daycare facilities, elderly housing convalescent facilities, or other sites who are more susceptible to adverse effects of exposure to air pollutants. Table B-23 presents the location and distance of the closest receptor and closest sensitive receptor relative to each site.

Table B-23: Distances to Closest Receptors

Site	Closest Receptor			Closest Sensitive Receptor		
	Name	Direction	Distance, mile	Name	Direction	Distance, mile
North Launch Area 1	Polihale State Park	N	<0.1	Polihale State Park	N	<0.1
North Launch Area 2	Polihale State Park	NE	1	Polihale State Park	NE	1
South Launch Area	Kokole Point	SW	0.2	Kokole Point	SW	0.2
Palai Olani	Mana Japanese Cemetery	SW	0.7	Kekaha Elementary School	SE	6.7
Waiapuaa Bay	Barking Sand Beach Cottages	NW	0.1	Barking Sand Beach Cottages	NW	0.1
Missile Defense Agency Hard Stand	Shenanigans Restaurant	NW	0.6	Kekaha Elementary School	SE	3.1
Airfield Bivouac Area	Kauai Veteran's Eternal Memorial	NE	0.1	Kekaha Elementary School	SE	6.0
Alternate Bivouac Area	Mana Japanese Cemetery	SW	1.0	Kekaha Elementary School	SE	6.7
Forward Arming and Refueling Point Areas	Mana Japanese Cemetery	SW	0.1	Kekaha Elementary School	SE	6.2
Unmanned Aircraft System Launch Area	Barking Sand Beach Cottages	SE	0.6	Barking Sand Beach Cottages	SE	0.6
Ground Maneuver Area	Polihale State Park	N	<0.1	Polihale State Park	N	<0.1
Kaula Island	No receptor as the island has no human population. It is accessible only with permission from the U.S. Navy.					

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Appendix C: Agency Correspondence

Environmental Assessment

Pacific Missile Range Facility

Land-Based Training and Testing

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There are no figures in this appendix.

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APPENDIX C Agency Correspondence

C.1 Cooperating Agencies

C.1.1 U.S. Department of the Navy to Missile Defense Agency

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR HI 96860-3131

IN REPLY REFER TO:
5090
Ser N46/0042
January 22, 2024

Mr. Scott M. Vickers
Director of Mission Support
Building 5222, Martin Road SW
Redstone Arsenal, AL 35898

Dear Mr. Vickers:

Subj: PACIFIC MISSILE RANGE FACILITY TERRESTRIAL TRAINING AND TESTING ENVIRONMENTAL ASSESSMENT– COOPERATING AGENCY

In accordance with the National Environmental Policy Act (NEPA), the Department of the Navy (Navy) is initiating the preparation of an Environmental Assessment (EA) to evaluate the potential environmental effects on land associated with military readiness training ("training") and research, development, testing, and evaluation (RDT&E or "testing") activities at the Pacific Missile Range Facility (PMRF), excluding the Kauai Test Facility portion of PMRF which is operated by the Department of Energy.

This EA will update the Navy's 2008 Hawaii Range Complex Environmental Impact Statement (EIS), for which the Missile Defense Agency (MDA) was a cooperating agency. The EA will incorporate all other Agency and Service range users, who have completed various disparate documents for NEPA compliance for recent training and testing. It will evaluate military readiness activities into the reasonably foreseeable future and incorporate evolving mission requirements associated with force structure changes, including those resulting from the development, testing, and ultimate introduction of new platforms and systems into the Joint Force.

In order to adequately evaluate the potential environmental effects of the Proposed Action, the Navy requests MDA's special expertise in assessing the potential impacts associated with Missile, Rocket, and Aerial Target Drone Launches occurring at PMRF. To assist in this effort and in accordance with the Council on Environmental Quality's (CEQ's) NEPA guidelines (specifically 40 C.F.R. Part 1501) and CEQ's 2002 guidance on cooperating agencies, the Navy requests that MDA serve as a cooperating agency for the development of the PMRF Terrestrial Training and Testing EA.

As defined in Section 107(a)(2) of NEPA and 40 C.F.R. Section 1501.7, the Navy is the lead agency for the EA. As the lead agency, the Navy will perform the following:

a. Supervise the preparation of the EA.

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Ser N46/0042
January 22, 2024

b. Request the participation of each cooperating agency in the NEPA process at the earliest possible time.

c. Determine the scope of the EA, including the alternatives evaluated, in consultation with any cooperating agency.

d. Develop a schedule, in consultation with each cooperating agency and such other entities as the Navy deems appropriate, for completion of any environmental review, permit, or authorization required to carry out the proposed agency action.

e. Circulate the NEPA document to the public and other interested parties.

f. Schedule and supervise meetings held in support of the NEPA process and compile comments received from the public.

g. Maintain an administrative record and respond to any Freedom of Information Act requests relating to the EA.

h. Maintain and execute an overall project planning schedule.

Navy respectfully requests that MDA, in its role as a cooperating agency, provide support as outlined in 40 C.F.R. Section 1501.8(b) and as follows:

a. Participate in the NEPA process at the earliest possible time.

b. Provide and review proposed activities that will be conducted within the Study Area.

c. Provide timely comments on working drafts of the EA. The Navy requests that comments on draft EA documents be provided in accordance with approved project schedules.

d. Adhere to the overall schedule as set forth by the Navy and provide advance notification to the Navy when there is a likelihood of missing schedule milestones.

e. Utilize MDA resources (including funding) to support its role as a cooperating agency.

f. Participate, as necessary, in meetings hosted by the Navy for discussion of issues related to the EA.

g. Participate in public meetings and attend any scheduled risk communication training in advance of those meetings.

h. Provide a formal, written response to this cooperating agency request.

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The Navy views meeting the commitments in this agreement as critical to the successful completion of the environmental planning process for the PMRF Terrestrial Training and Testing EA. MDA assistance will be invaluable in this endeavor.

We appreciate your consideration of our request and look forward to your response. The Navy point of contact for this action is Mr. Brian Whitehouse, who may be reached via phone at 808-471-4696 or via email at brian.p.whitehouse.civ@us.navy.mil.

Sincerely,

J. H. BEATTIE
Captain, U.S. Navy
Deputy Fleet Civil Engineer
By direction

Copy to:
COMPACFLT (N465)
COMNAVREG HI (N45)

3

C.1.2 Missile Defense Agency to U.S. Department of the Navy

DEPARTMENT OF DEFENSE
MISSILE DEFENSE AGENCY
5700 18TH STREET
FORT BELVOIR, VIRGINIA 22060-5573

August 16, 2024

MEMORANDUM FOR DEPUTY FLEET ENGINEER OF THE UNITED STATES PACIFIC FLEET

SUBJECT: Invitation to Become a Cooperating Agency on the Pacific Missile Range Facility Terrestrial Training and Testing Environmental Assessment

The Missile Defense Agency (MDA) accepts the Department of the Navy (DON) invitation, dated January 22, 2024, to be a Cooperating Agency (CA) in preparation of the Pacific Missile Range Facility Land-Based Training and Testing Environmental Assessment (EA), which was previously titled as the Pacific Missile Range Facility Terrestrial Training and Testing EA. MDA acknowledges that the DON will act as the Lead Agency to prepare and coordinate the EA.

MDA agrees that in its role as a CA, we will provide support as outlined in 40 C.F.R. Section 1501.8(b) and as follows:

a. Participate in the National Environmental Policy Act process at the earliest possible time.
b. Provide and review proposed activities that will be conducted within the Study Area.
c. Provide timely comments on working drafts of the EA. The DON requests that comments on draft EA documents be provided in accordance with approved project schedules.
d. Adhere to the overall schedule as set forth by the DON and provide advance notification to the DON where there is a likelihood of missing schedule milestones.
e. Utilize MDA resources (including funding) to support its role as a CA.
f. Participate, as necessary, in meetings hosted by the DON for discussion of issues related to the EA.
g. Participate in public meetings and attend any scheduled risk communication training in advance of those meetings.
h. Provide a formal, written response to this CA request.

We've Got You Covered!

MDA looks forward to working with the DON to complete the EA process. The main MDA point of contact for this matter is Dr. Buff Crosby, Director of Environmental Management. Her contact information is: buff.crosby@mda.mil and office phone: 256-955-4032.

WITHERS.JOHN.RAY.1104582172 Digitally signed by WITHERS.JOHN.RAY.1104582172 Date: 2024.08.16 12:57:40 -05'00'

JOHN R. WITHERS
Director for Mission Support (Acting)

2

C.2 Coastal Zone Management Act

C.2.1 U.S. Department of the Navy to Coastal Zone Management Program

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR HI 96860-3131

IN REPLY REFER TO:
5090
Ser N46/0623
September 16, 2024

Ms. D.L. Mendes
Office of Planning, State of Hawaii
Coastal Zone Management Program
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Ms. Mendes:

SUBJECT: COASTAL ZONE MANAGEMENT ACT DE MINIMIS DETERMINATION PACIFIC MISSILE RANGE FACILITY LAND-BASED TRAINING AND TESTING ACTIVITIES ENVIRONMENTAL ASSESSMENT, STATE OF HAWAII

In accordance with the Coastal Zone Management Act of 1972 (CZMA) as amended, Section 307c(1), the United States (U.S.) Department of the Navy (Navy) has determined that proposed military training and testing activities within the Pacific Missile Range Facility (PMRF) would have insignificant direct, indirect, and cumulative coastal effects and does not require a negative determination or consistency determination as supported by the following:

a. Military training and testing activities would occur entirely on federal property.

b. Military training and testing activities on federal land are included in the "*Navy/Marine Corps De Minimis Activities Under CZMA*." Per the July 9, 2009, memo (enclosure 1), the Office of Planning (now known as the Office of Planning and Sustainable Development) concurred that military training and testing activities are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects and therefore categorized as de minimis in accordance with 15 Code of Federal Regulations Section 930.33(a)(3). Per the memo, with implementation of corresponding mitigation, standard operating procedures and the referenced conditions, military training and testing activities would not be subject to further review under the Hawaii CZM program.

c. In-water effects associated with proposed military training and testing activities at PMRF were analyzed in the 2018 Hawaii-Southern California Training and Testing (HSTT) Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) and are currently being reanalyzed in the Hawaii-California Training and Testing (HCTT) Draft EIS/OEIS, which will include a separate CZMA analysis to assess possible effects to in-water coastal uses or resources.

The Navy has prepared the Draft Pacific Missile Range Facility Land-Based Training and Testing Environmental Assessment (PMRF LBTT EA) in accordance with the National

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Environmental Policy Act. The Draft EA includes a comprehensive description of the Proposed Action and environmental resources that could be affected by the Proposed Action (enclosure 2).

Project Description

The Navy's Proposed Action is to continue to conduct land-based, multi-domain military training and testing activities to support training readiness into the reasonably foreseeable future at launch areas and other locations within the existing PMRF and Ka'ula Island footprints on Kaua'i, Hawaii. The area consists of the land component of PMRF, a roughly 0.5-mile wide and 7.5-mile long area, beginning at the high tide line and extending inland to the boundary of the PMRF installation, and Ka'ula Island. The Proposed Action does not include construction activities or the use of lands outside of areas currently used for similar military training and testing activities on federally owned land at PMRF. The military training and testing activities include ongoing and proposed land-based training and testing activities conducted by the Navy, U.S. Army (Army), U.S. Air Force (Air Force), U.S. Marine Corps (Marine Corps), and the Missile Defense Agency (MDA) at launch areas and other locations under the management of PMRF. The Proposed Action would include increases in some military training and testing activities and may include the participation of foreign militaries under U.S. sponsorship and oversight. All activities included in the Proposed Action have been previously conducted at PMRF at some point over the past 20 years and have been analyzed in prior relevant environmental documentation.[1]

Proposed Training and Testing Activities

The following PMRF land-based military training and testing activities associated with the Proposed Action may be combined sequentially or accomplished in parallel. Training events would be generally progressive in nature and would range in time from one hour to two weeks. Events would be episodic in terms of duration in any 24-hour period (i.e., some events may be start-stop and not continuous in any given day), depending on the specific activity. Not all locations within PMRF would be utilized over a given 1-year period. Military training and testing schedules are highly variable, dependent on individual and collective unit readiness requirements, deployment cycles, and resource availability.

The following military training and testing activities are ongoing at PMRF and Ka'ula Island and would continue to occur under the Proposed Action:

a. Missile, Rocket, and Aerial Target Drone Launches

b. Missile, Rocket, and Aerial Drone Target Set-ups (No Launch)

[1] Relevant prior environmental documentation includes, but is not limited to, the 1998 PMRF Enhanced Capability Final EIS, the 2008 Hawaii Range Complex Final EIS/Overseas EIS, and the 2010 PMRF Intercept Test Support EA/Overseas EA.

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c. Artillery Exercises (land-based, mobile, live-fire systems oriented towards the ocean and within PMRF airspace)

d. Amphibious Operations (raid, small boat operations, and swimmer insertion/extraction)

e. Forward Arming and Refueling Point Operations

f. Small Unmanned Aircraft Systems and Counter-Small Unmanned Aircraft Systems

g. Parachute Operations

h. Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting

i. Bivouacking (establishment of expeditionary field lodging / tents)

j. Air-to-Ground Gunnery Exercises on Ka'ula Island

k. Air-to-Ground Bombing Exercises on Ka'ula Island

l. Landing Zone Operations

m. Ground Maneuvers

Information on increased tempo of some activities and duration of each activity is included in the Draft EA with detailed descriptions in Appendix A (Military Readiness Activity Descriptions).

Conclusion

Military training and testing activities would occur entirely on federal property and are included in the *"Navy/Marine Corps De Minimis Activities Under CZMA"* (enclosure 1). Military Testing and Training are listed as Proposed Action 12, and as such, these ongoing proposed activities have already been considered to have insignificant direct, indirect and cumulative coastal effects. With implementation of the following corresponding mitigation and conditions, training and testing activities would not require further review under the Hawaii CZM program. Table 1 outlines how the Navy plans to comply with the General Conditions in enclosure (1).

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Table 1: Potential Mitigation/General Conditions Applicable for Military Training and Testing Activities

#	Potential Mitigation/General Conditions	Navy Compliance
9	Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.	Fueling of project-related vehicles and equipment will take place away from the water and a contingency plan to control petroleum products accidentally spilled is part of the Proposed Action as a standard operating procedure.
13	Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). If the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.	Potential impacts of the action on species and habitats protected under the ESA have been addressed in the Environmental Assessment (EA). The Navy is engaging in informal consultation with the USFWS regarding ESA-listed species.
14	The National Environmental Policy Act (NEPA) review process will be completed.	A Draft EA has been prepared and is available for public review. In addition, the Navy will be conducting a public meeting on September 17, 2024, to ensure the public is properly informed.
15	The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.	Military training and testing activities will be conducted in accordance with applicable standard operating procedures protective to the environment. Standard operating procedures and best management practices have been incorporated as part of the Proposed Action.
16	Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA).	This letter is the Navy's notification of proposed training and testing activities at Pacific Missile Range Facility in which an EA is being prepared.

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Based on the information summarized above, and as analyzed in the PMRF LBTT EA, the Navy has determined the implementation of the Proposed Action is on the list of *De Minimis* Activities and no further review is necessary under CZMA.

The point of contact for this matter is Brian P. Whitehouse. He may be reached via email at brian.p.whitehouse.civ@us.navy.mil or via phone at 808-471-4696.

Sincerely,

J. H. BEATTIE
Captain, U.S. Navy
Deputy Fleet Civil Engineer
By direction

Enclosures: 1. July 9, 2009, Memo from the State of Hawaii Office of Planning "*Hawaii Coastal Zone Management (CZM) Program Federal Consistency Concurrence with Modifications to the Department of the Navy De Minimis Activities in Hawaii under the Coastal Zone Management Act (CZMA)*"
2. Draft Pacific Missile Range Facility Land-Based Training and Testing Environmental Assessment with Appendices

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C.3 Coastal Zone Management Program to U.S. Department of the Navy

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-12644

July 9, 2009

Lieutenant Commander E. J. D'Andrea
Assistant Regional Engineer
Department of the Navy
Commander
Navy Region Hawaii
850 Ticonderoga Street, Suite 110
Pearl Harbor, Hawaii 96860-5101

Attention: Mr. Brian Yamada

Dear Lt. Commander D'Andrea:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Concurrence with Modifications to the Department of the Navy De Minimis Activities in Hawaii under the Coastal Zone Management Act (CZMA)

The Hawaii CZM Program has completed the federal consistency review of the proposed modifications to the list of Department of the Navy de minimis activities under the CZMA, including changes to various activity categories, adding new activity categories, and expanding the coverage to Marine Corps Base Hawaii Kaneohe Bay and Camp Smith. The CZM Program conducted a thorough review of the request and a public notice of the CZM review was published in the State of Hawaii Office of Environmental Quality Control's publication, *The Environmental Notice*, on June 23, 2009. The public was provided an opportunity to participate in the review through July 7, 2009. There were no public comments received.

We concur that the activities identified on the modified list entitled, "Navy/Marine Corps De Minimis Activities Under CZMA" are expected to have insignificant direct or indirect (cumulative and secondary) coastal effects, and should not be subject to further review by the Hawaii CZM Program on the basis and condition that the listed activities are subject to and bound by full compliance with the corresponding "Project Mitigation / General Conditions."

The Hawaii CZM Program reserves the right to review, amend, suspend, and/or revoke the "Navy/Marine Corps De Minimis Activities Under CZMA" list whenever it finds that a listed activity or activities will have reasonably foreseeable coastal effects. CZM consistency

concurrence does not convey approval with any other regulations administered by any State or County agency.

Modifying and expanding the list of Navy de minimis activities under the CZMA was a cooperative effort between our Office and Mr. Brian Yamada from the Department of the Navy, who interned with the Hawaii CZM Program in September 2008. We appreciate the efforts of Mr. Yamada in working with our CZM staff. The de minimis activities list will result in more efficient compliance with CZMA federal consistency requirements for both the Navy and the Hawaii CZM Program.

If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch (w/ copy of de minimis list)
Ms. Rebecca Hommon, Region Counsel, Navy Region Hawaii

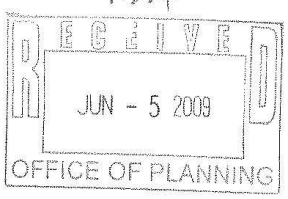
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DEPARTMENT OF THE NAVY
COMMANDER
NAVY REGION HAWAII
850 TICONDEROGA ST STE 110
PEARL HARBOR, HAWAII 96860-5101

5090
Ser N4/ 04163
01 JUN 2009

CERTIFIED MAIL NO. 7007 2560 0002 0326 9580

Mr. Abbey Mayer
Office of Planning
Department of Business, Economic
Development and Tourism
P. O. Box 2359
Honolulu HI 96804



Dear Mr. Mayer:

SUBJECT: REQUEST FOR CONCURRENCE WITH MODIFICATIONS TO THE DEPARTMENT OF THE NAVY DE MINIMIS ACTIVITIES UNDER THE COASTAL ZONE MANAGEMENT ACT (CZMA)

This letter is to request your concurrence with the attached list of Navy/Marine Corps de minimis activities under the CZMA. The attached de minimis list will amend the current de minimis list which was established on April 2, 2007. The new de minimis list will include the Marine Corps, and will cover areas in the Pearl Harbor Naval complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station Pacific, Pacific Missile Range Facility on Kauai, Kaneohe Marine Corps Base Hawaii, Camp Smith and all associated installations/facilities/equipment located outside of those Navy/Marine Corps properties.

The Navy and Marine Corps have determined that the listed Proposed Actions have insignificant direct or indirect (cumulative and secondary) coastal effects and should therefore be categorized as de minimis in accordance with the Department of Commerce, National Oceanic and Atmospheric Administration, CZMA Federal Consistency Regulations 15 CFR part 930.33 (3). With the corresponding mitigation and conditions applied, these actions would be exempt from a negative determination or a consistency determination from the State of Hawaii.

Should you have any questions, please contact Mr. Brian Yamada at 472-1449, by facsimile transmission at 474-5419, or by email at brian.yamada@navy.mil.

Sincerely,

E. J. D'ANDREA
Lieutenant Commander, CEC, U. S. Navy
Assistant Regional Engineer
By direction of the
Commander

Enclosure: 1.Navy De minimis Activities Under CZMA

Navy/Marine Corps De Minimis Activities Under CZMA

***covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties**

No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeting and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingrants/outgrants and/or 50 acres or more where existing land use will change.	14, 16

ENCLOSURE(/)

Navy/Marine Corps De Minimis Activities Under CZMA

***covering areas in Pearl Harbor Naval Complex, Naval Magazine Lualualei, Naval Communications and Telecommunications Area Master Station (NCTAMS) Pacific, Pacific Missile Range Facility (PMRF), Kaneohe Marine Corps Base Hawaii, Camp Smith, and all associated installations/facilities/equipment located outside of these Navy/Marine Corps properties**

No.	Proposed Action	Description	Mitigation / Conditions
1	New Construction	Construction of new facilities and structures wholly within Navy/Marine Corps controlled areas (including land and water) that is similar to present use and, when completed, the use or operation of which complies with existing regulatory requirements.	1, 3, 6, 8, 9, 10, 11, 13, 14, 16
2	Utility Line Activities	Acquisition, installation, operation, construction, maintenance, or repair of utility or communication systems that use rights of way, easements, distribution systems, or facilities on Navy/Marine Corps controlled property. This also includes the associated excavation, backfill, or bedding for the utility lines, provided there is no change in preconstruction contours.	1, 10, 11, 12, 14, 16
3	Repair and Maintenance	Routine repair and maintenance of buildings, ancillary facilities, piers, wharves, dry docks, vessels, or equipment associated with existing operations and activities.	12, 14, 16
4	Aids to Navigation	Includes buoys, beacons, signs, etc. placed within Navy/Marine Corps controlled coasts and navigable waters as guides to mark safe water.	2, 5, 14, 16
5	Structures in Fleeting and Anchorage Areas	The installation of structures, buoys, floats and other devices placed within anchorage or fleeting areas to facilitate moorage of vessels within Navy/Marine Corps controlled property.	2, 5, 14, 16
6	Oil Spill and Hazardous Waste Cleanup	Activities required for the containment, stabilization, removal and cleanup of oil and hazardous or toxic waste materials on Navy/Marine Corps controlled property.	1, 8, 14, 16
7	Maintenance Dredging	Excavation and removal of accumulated sediment for maintenance to previously authorized depths.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
8	New Dredging	Excavation and removal of material from the ocean floor not to exceed 100 cubic yards below the plane of the ordinary high water mark or the mean high water mark from navigable waters of the US and; excavation and removal of material from the ocean floor within Navy/Marine Corps controlled property. This does not include dredging or degradation through coral reefs.	2, 3, 4, 5, 7, 8, 9, 13, 14, 16
9	Scientific Measuring Devices	The installation of devices which record scientific data (staff gages, tide gages, water recording devices, water quality testing and improvement devices and similar structures) on Navy/Marine Corps controlled property. Devices must not transmit acoustics (certain frequencies) that will adversely affect marine life.	1, 2, 14, 16
10	Studies and Data Collection and Survey Activities	Studies, data and information-gathering, and surveys that involve no permanent physical change to the environment. Includes topographic surveys, wetlands mapping, surveys for evaluating environmental damage, engineering efforts to support environmental analyses, core sampling, soil survey sampling, and historic resources surveys.	2, 3, 6, 8, 9, 11, 12, 13, 14, 16
11	Demolition	Demolition and disposal involving buildings or structures when done in accordance with applicable regulations and within Navy/Marine Corps controlled properties.	1, 11, 12, 14, 16
12	Military Testing and Training	Routine testing and evaluation of military equipment on or over military, or an established range, restricted area or operating area or training conducted on or over military land or water areas in which the impact is not significant.	9, 13, 14, 15, 16
13	Real Estate/Property Transfer	Real estate acquisitions or outleases of land involving new ingrants/outgrants and/or 50 acres or more where existing land use will change.	14, 16

ENCLOSURE(/)

14	Mission Changes	Mission changes, base closures/relocations/consolidations, and deployments that would cause long term population increases or decreases in affected areas.	14, 16
15	Limitation of Access to Property	Permanent closure or limitation of access to any areas that were open previously to public use, such as roads or recreational purposes (provided the access is not required by established agreements with State of Hawaii, private industry, etc.)	14, 16
16	Environmental Management Activities	Environmental management activities within Navy/Marine Corps controlled areas including, but not limited to, activities such as vegetation and mangrove removal, ditch clearing, sediment removal, invasive species removal, construction related to protecting endangered species and wildlife, and actions prescribed by the Integrated Natural Resources Management Plan (INRMP)	2, 13, 14, 16
17	Towers	Installation, operation, and maintenance of towers (such as communication towers, cellular phone antennas, wind-energy towers) within Navy/Marine Corps controlled areas.	1, 2, 6, 8,9 , 12, 13, 14, 16
18	Alternative Energy Research	Installation, operation, replacement, and removal of alternative energy research structures/equipment taking place within Navy/Marine Corps controlled areas.	1, 2, 3, 5, 6, 12, 13, 14, 16
19	Army Corps Nation Wide Permits	Work subject to an Army Corps of Engineers Nationwide permit (which are applicable to Hawaii)	16

Project Mitigation / General Conditions

1) Navy/Marine Corps controlled property refers to land areas, rights of way, easements, roads, safety zones, danger zones, ocean and naval defensive sea areas under active Navy/Marine Corps control.
2) If any listed species enters the area during conduct of construction activities, all activities should cease until the animal(s) voluntarily depart the area.
3) Turbidity and siltation from project related work shall be minimized and contained to within the vicinity of the site through appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
4) Dredging/filling in the marine/aquatic environment shall be scheduled to avoid coral spawning and recruitment periods.
5) All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
6) No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channels, wetlands, etc.).
7) All debris removed from the marine/aquatic environment shall be disposed of at an upland site or EPA approved ocean disposal site, and Best Management Practices shall be followed.
8) No contamination (trash or debris disposal, alien species introductions, etc.) of adjacent marine/aquatic environments (reef flats, channels, open ocean, stream channels, wetlands, etc.) shall result from project-related activities.
9) Fueling of project-related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored on-site, if appropriate, to facilitate clean-up of accidental petroleum releases.
10) Any under-layer fills used in the project shall be protected from erosion with stones (or core-loc units) as soon after placement as practicable.
11) Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric, etc.) after exposure and stabilized as soon as practicable (with vegetation matting, hydroseeding, etc.).
12) Section 106, of the National Historic Preservation Act (NHPA), consultation requirements must be met. Also, follow guidelines in the area-specific Integrated Cultural Resources Management Plan (ICRMP) if applicable.
13) Navy/Marine Corps shall evaluate the possible impact of the action on species and habitats protected under the Endangered Species Act (ESA). if the Navy/Marine Corps determines that no such species or habitats will be affected by the action, neither U.S. Fish and Wildlife (FWS) Service nor National Oceanic and Atmospheric Administration (NOAA) concurrence is required. Should it be determined by the Navy/Marine Corps, FWS, or NOAA that the action may affect any such species or habitat, informal or formal consultation will be initiated by the Navy/Marine Corps as required by section 7 (Interagency Cooperation) of the ESA.
14) The National Environmental Policy Act (NEPA) review process will be completed.
15) The training, testing and evaluation will be conducted in accordance with applicable standard operating procedures protective of the environment.
16) Navy or Marine Corps staff shall notify State CZM of de minimis list usage for projects which require an Environmental Assessment (EA). Notification can be sent via email: to JNakagaw@dbedt.hawaii.gov

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C.3.1 Hawaii Coastal Zone Management Program to U.S. Department of the Navy

From: Mendes, Debra L [redacted]
Sent: Monday, September 30, 2024 2:25 PM
To: Whitehouse, Brian P CIV USN COMPACFLT (USA) [redacted]
Cc: Evans, Mary Alice [redacted]
Subject: [Non-DoD Source] RE: CZMA De Minimis Determination Pacific Missile Range Facility (PMRF) Barking Sands Environmental Assessment (EA)

Mr. Whitehouse,

This email is an acknowledgment of receipt and acceptance of the Navy's use of the CZMA de minimis list regarding the subject Pacific Missile Range Facility (PMRF) Land-Based Training and Testing. This acknowledgment does not represent an endorsement of the proposed federal agency activity nor convey approval with any regulation administered by any state or county agency.

Thank you.

Debra Mendes

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Debra L. Mendes

Hawaii Coastal Zone Management Program

[redacted]

C.4 U.S. Fish and Wildlife Service

C.4.1 U.S. Department of the Navy to U.S. Fish and Wildlife Service

DEPARTMENT OF THE NAVY
COMMANDER
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR HI 96860-3131

IN REPLY REFER TO:
5090
Ser N46/0685
October 3, 2024

Dr. Earl Campbell
Project Leader
U.S. Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard Room 3-122
Honolulu, HI 96850

Dear Dr. Campbell:

SUBJECT: REQUEST FOR RE-INITIATION OF ENDANGERED SPECIES ACT SECTION 7 INFORMAL CONSULTATION FOR EFFECTS OF LAND BASED TRAINING AND TESTING ON PACIFIC MISSILE RANGE FACILITY, BARKING SANDS, KAUAI AND KAULA ISLAND, HI

In accordance with section 7 of the ESA and 50 C.F.R. §402.12(f), the U.S. Navy (Navy) submits the enclosed Biological Evaluation (BE) (enclosure) in support of our request to reinitiate informal consultation for ongoing training and testing activities occurring on Pacific Missile Range Facility (PMRF) Barking Sands (Main Base), Kauai and Kaula Island, Hawaii. This consultation is a re-initiation of the 2008 (HRC 2008-I-0232) and 2021 (HRC 01EPIF00-2008-I-0232-R001) Hawaii Range Complex (HRC) ESA Section 7 consultations.

The Navy has developed the BE to include additional information on training actions and the analysis of effects specifically for impacts on Hawaii Distinct Population Segment (DPS) of the band-rumped storm-petrel (*Hydrobates castro*) Main Base and ihi (*Portulaca villosa*) on Kaula Island. These species were listed as endangered in 2016, therefore the 2008 HRC consultation did not analyze effects from training and testing activities on these species. The 2021 HRC consultation specifically analyzed effects associated with missile launches and live fire at PMRF Main Base, which does not support *P. villosa* populations.

The enclosed BE includes an analysis for actions not covered in the 2008 and 2021 HRC consultations, which are comprised of parachute operations and Forward Arming and Refueling Point (FARP) activities. Consequently, the Navy has determined Hawaiian hoary bat (*Aeorestes semotus*), Hawaiian duck (*Anas wyvilliana*), Hawaiian goose (*Branta sandvicensis*), Hawaiian coot (*Fulica alai*), Hawaiian common gallinule (*Gallinula chloropus sandvicensis*), Hawaiian black-necked stilt (*Himantopus mexicanus knudseni*), Newell's Shearwater (*Puffinus newell*), Hawaiian petrel (*Pterodroma sandwichensis*), band-rumped storm-petrel, the Hawaii DPS of the green sea turtle (*Chelonia mydas*), hawksbill sea turtle (*Eretmochelys imbricata*), *P. villosa* and lauehu (*Panicum niihauense*) Critical Habitat may be affected, but are not likely to be adversely affected, by ongoing Department of Defense (DoD) training and testing activities at PMRF Main

DEPARTMENT OF THE NAVY
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5090
Ser N46/0685
October 3, 2024

Base and Kaula Island related to environmental stressors associated with training and testing actions.

The Navy acknowledges that Section 7(d) of the ESA contains a provision that after initiation of consultation required under Section 7(a)(2), "a federal agency shall not make any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures which would not violate subsection (a)(2)." While this prohibition is in force until the reinitiated consultation is concluded, it does not preclude implementation of non-jeopardizing activities (as are all herein) if to do so would not violate Section 7(d). Thus, during this period of re-initiation, the Navy plans to continue to conduct training and testing events, as described in the Navy's proposed action and continue implementing all the associated conservation measures.

The Navy appreciates your staff's continued assistance on this urgent matter and kindly requests your review and concurrence on the enclosed BE. Please contact Kimberly O'Connor of my staff via email at kimberly.a.oconnor16.civ@us.navy.mil or via phone at (619) 545-9339 regarding this informal consultation.

Sincerely,

J. H. BEATTIE
Captain, U.S. Navy
Deputy Fleet Civil Engineer
By direction

Enclosure: September 2024, Hawaii Range Complex Land-Based Training Activities Re-Initiation Terrestrial Biological Evaluation

2

C.4.2 U.S. Fish and Wildlife Service to U.S. Department of the Navy

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:
2025-0011513

December 3, 2024

J.H. Beattie
Captain, U.S. Navy
Deputy Fleet Civil Engineer
United States Pacific Fleet
250 Makalapa Drive
Pearl Harbor, Hawai'i 96860-3131

Subject: Informal Section 7 Consultation for Land-based Training and Testing Activities on Pacific Missile Range Facility, Barking Sands, Kaua'i and Ka'ula Island, Hawai'i

Dear Captain Beattie:

The U.S. Fish and Wildlife Service (Service) received your letter on October 4, 2024 requesting re-initiation of informal consultation pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. §1531 *et seq.*) for ongoing training and testing activities occurring on the Pacific Missile Range Facility (PMRF) Barking Sands (Main Base), Kaua'i and Ka'ula Island, Hawai'i. This consultation is a re-initiation of the U.S. Navy's (Navy) 2008 (01EPIF00-2008-I-0232-R001) and 2021 (01EPIF00-2021-I-0329) Hawai'i Range Complex (HRC) ESA Section 7 consultations due to changes in the project description and consideration of additional species listed in 2016. You requested our concurrence with your determination that the described activities may affect, but are not likely to adversely affect, designated critical habitat for *Panicum niihauense* and the following ESA-listed species:

- Hawaiian goose (nēnē, *Branta sandvicensis*)
- Hawaiian waterbirds
  - Hawaiian duck (koloa maoli, *Anas wyvilliana*)
  - Hawaiian coot ('alae ke'oke'o, *Fulica alai*)
  - Hawaiian common gallinule ('alae 'ula, *Gallinula galeata sandvicensis*)
  - Hawaiian stilt (ae'o, *Himantoopus mexicanus knudseni*)
- Hawaiian seabirds
  - Newell's shearwater ('a'o, *Puffinus newelli*)

PACIFIC REGION 1

IDAHO, OREGON*, WASHINGTON,
AMERICAN SĀMOA, GUAM, HAWAI'I, NORTHERN MARIANA ISLANDS
*PARTIAL

  - Hawaiian petrel (ʻuaʻu, *Pterodroma sandwichensis*)
  - Hawaiʻi Distinct Population Segment of the band-rumped storm petrel (ʻakēʻakē, *Hydrobates castro*)
- Hawaiian hoary bat (ʻōpeʻapeʻa , *Lasiurus cinereus semotus*)
- Green sea turtle (honu, *Chelonia mydas*)
- Hawksbill sea turtle (honuʻea, *Eretmochelys imbricata*)
- *Panicum niihauense* (lauʻehu)
- *Portulaca villosa* (ihi)

Project Description

The Navy and associated Department of Defense (DoD) components propose to continue land-based training activities on PMRF and Kaʻula Island (Figure 1), which include: hypersonic vehicle launches and live fire, air to ground exercises on Kaʻula Island, radar operations, amphibious actions, helicopter/tilt rotor landing zone operations, forward arming and refueling point (FARP) operations, parachute landing operations, unmanned aerial system (UAS) launches, command and control operations, ground maneuvers, and bivouacking. The tempo of training events fluctuates year to year, based on requests from DoD entities and associated partners to utilize PMRF Main Base for training and testing. Each of these activities is described in the individual sections below. Additionally, larger exercises such as Rim of the Pacific (RIMPAC) or Large Scale Exercise (LSE) may increase the tempo of training on a given year. Generally, exercises are conducted mainly at sea, last from three to 45 days in length and are scheduled at least a month apart from one another.

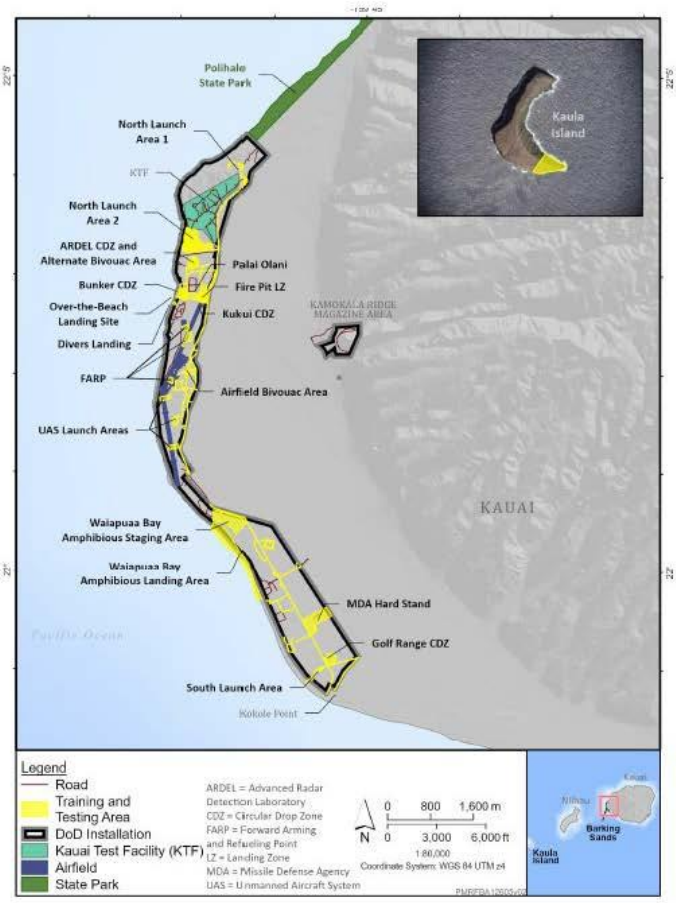


Figure 1. PRMF Barking Sands Facilities and Training Locations.

Hypersonic Vehicle Launches and Live Fire

All launches and live fire activities will occur on Navy-managed launch sites: The 50K Launch Area [North Launch Area 2] and the North Launch Complex [North Launch Area 1]. The North Launch Complex contains nine launchers, some of which are mobile/temporary (Figure 2).



Figure 2. Northern Launch Pad Areas at PMRF Barking Sands

Tempo of launches and live fire activities fluctuate during the event based on the logistics and purpose of the training or testing exercise. For example, some exercises involve launches of multiple aerial targets, or missiles and rockets, in one day, consecutive days or spaced out over multiple days based on the requirements and mission of the exercise. Launches can be 30 seconds apart or hours apart, or one target, missile or rocket may be launched during the day and one at night. Larger scale events may involve 15-17 launches during the event, with the possibility of 4 launches in one day. Some exercises include dual launches where multiple targets, missiles or rockets could be launched at the same time. Launches can occur day or night.

At Barking Sands, ground forces conduct live fire activities that may include the use of artillery and aerial gunnery. Joint Force exercises and other customers' requests may involve the use of machine guns and/or small arms. Live fire would take place on the western shoreline of the 50K Launch Area. Ground forces do not fire or conduct live fire on the berms and stay inland of the berm road. Users shoot towards a target in the ocean. Live fire exercises also occur periodically throughout the year at the 50K Launch Area and the North Launch Complex, with frequency and intensity ranging based on the event's tempo and logistics.

- AERIAL VEHICLES
  The navy launches a variety of flight vehicles, including aerial targets, missiles, and rockets. These flight vehicles utilize different propulsion methods based on their weight class. Aerial targets (e.g. BQM-177s & BQM-34s), which utilize Jet Assisted Takeoff (JATO) canisters are, the most common flight vehicles launched at Barking Sands. The larger flight vehicles, including the AEGIS Readiness Assessment Vehicle (ARAV) target vehicles, may use rocket propellant to assist with takeoff and the multistage

motors. Flight vehicles and associated launch pads are categorized by weight class. For example, a 50K launch pad can only handle a flight vehicle that weighs 50,000 lbs. or less. Aerial targets known as target drones are a type of unmanned aerial vehicle (UAV) and are commonly used for training and testing purposes. Aerial targets are used to emulate enemy aircraft threats for at-sea training and testing purposes. At PMRF, these aerial targets are launched from the PMRF North Launch Complex and 50K Launch Area. While target types and names can change with technology, typical targets are the BQM-177 (subsonic), BQM-34S (subsonic), GQM-163 (subsonic).

- MISSILES FROM PADS
  In addition to aerial targets, the Navy occasionally launch Standard Missiles.
- MISSLES AND ROCKETS FROM ROAD VEHICLE
  The Navy, in coordination with other agencies, performs missile and rocket launches from mobile road vehicles. Mobile launch systems are primarily operated from within the 50K Launch Area and are used during larger-scale events led by Navy (i.e. RIMPAC, LSE). Examples of mobile launch systems include the Phased Array Tracking Radar to Intercept on Target (PATRIOT), which is surface-to-air missile system, the High Mobility Artillery Rocket System (HIMARS), which is a mobile wheeled launcher that can accommodate different munitions from the entire Guided Multi Launch Rocket System (GMLRS) munitions family, the Navy/Marine Expeditionary Ship Interdiction System (NMESIS), which is an anti-ship weapons systems that includes a mobile road vehicle, known as a rough fire system and the Type 12 Surface to Ship Missile (SSM), is a truck mounted anti-ship missile system.

Air-to-Ground Exercises on Ka'ula Island

The southern portion of Ka'ula Island is used by the Navy and DoD components for air-to-ground gunnery (GUNEX) and air-to-ground inert bombing (BOMEX) exercises using only non-explosive practice munitions (Figure 3). Air-to-ground GUNEX by the Services includes inert gunnery training from fixed or rotary-wing aircraft to fire upon ground targets, day or night, with the goal of destroying or disabling enemy vehicles, structures or personnel. GUNEX may include the use of targeting laser. The use of 20-mm and 30-mm cannon fire is not allowed from November through May.

BOMBEX, operations consist of air-to-ground delivery of small, 25-lb, inert MK-76 (a type of training ordnance); inert laser-guided bombs, such as but not limited to the Hellfire, or the MK-82, a 500-lb bomb. Bombing exercises originate from an aircraft carrier. CSG fixed-wing aircraft account for all the Navy BOMBEX operations at Ka'ula. Only inert ordnance 500-lb or ess is authorized for use on Ka'ula. Inert bombs will be dropped from aircraft during this training operation.



Figure 3. Ka'ula Island

PMRF Radar Operations

Radar Operations, such as use of advanced radar systems, are conducted for mission-critical activities such as tracking threats like aircraft, unmanned air vehicles and missiles, determining positions of ships and submarines, providing early warning to the armed forces, civilians and homeland, directing artillery fires, forecasting weather, and navigating ships and aircraft. Training with radar helps aircrews improve their survivability and combat effectiveness.

PMRF Amphibious Actions

An amphibious exercise (now referred to as an expeditionary assault exercise) provides a realistic environment for amphibious training, reconnaissance training, hydrographic surveying, surf condition observance, and communication. Amphibious exercises consist of a seaborne force assaulting a beach with a combination of helicopters, Landing Craft Air Cushion (LCAC), Amphibious Assault Vehicles (AAVs), Expedtionary Fighting Vehicle (EFV) and landing craft. More robust expeditionary assault operations include support by Naval Surface Fire Support (NSFS), Close Air Support (CAS) and Marine artillery.

Amphibious Operations may include but are not limited to:

- *Raid*. Company (unit-sized) forces move from amhibious ships at sea, conduct amphibious landing via various vessels/watercraft/vehicles, and conduct follow-on activities ashore. Return to amphibous ships at sea.

- *Small Boat Operations*. A Unit using small boats move from an offshore location to a beach landing site, carry the boat to an inland site, conduct reconnaissance, and then return to the sea via small boat.
- *Swimmer Insertion/Extraction*. Personnel conduct Over-the-Beach water entry swimmer insertion and extration training in PMRF amphibious landing areas.

The troops disperse from the landing craft and use existing vegetation for cover and concealment while attacking enemy positions. The landing craft and troops proceed to a designated area where they stay 1 to 4 days. When the expeditionary assault exercise is complete, the backload operation takes place. The backload is normally accomplished over a 2- to 3-day period. Amphibious landings are restricted to specific areas of designated beaches. Before an amphibious landing exercise is conducted, a hydrographic survey is performed to map out the precise transit routes throgh sandy bottom areas. During the landing, the crews follow established procedures, such as having a designated lookout watching for other vessels, obstructions to navigation, marine mammals (whales or monk seals) and sea turtles. Amphibious activities may occur at Waiapuaa Bay Beach Landing Area, Divers Landing and Over the Beach Landing (see Figure 1).

PMRF Helicopter/Tilt Rotor Landing Zone Operations

The PMRF air operation facilities include four helicopter landing pads (see Figure 1), which support a variety of fixed wing and rotary aircraft, including C-26 and C-17 airplanes, S-61 cargo helicopters and MV-22 Osprey. The S-61 helicopters conduct range support missions, utility/transport missions, as well as torpedo and aerial target recoveries. MV-22's train at PMRF for both vertical and short take-off capabilities.

PMRF Forward Arming and Refueling Point (FARP) Operations

The FARP mission is to provide fuel and ordnance necessary for highly mobile and flexible helicopter and fixed-wing operations. FARPs are temporary, transitory facilities established for a specific duration and mission (see Figure 1). The scope of flight operations in the FARP area include, but are not limited to, establishing, operating, and re-deploying a FARP site using the Tactical Airfield Fuel Dispensing Systems, Helicopter Expedient Refueling System, or similar type expeditionary aircraft refueling system. The objective of FARP is to minimize response time and decrease turnaround time in support of sustained operations. Minimizing flight time to and from the FARP and reducing the refueling and rearming time within the FARP achieves this objective. Fueling and arming of assault support aircraft can be accomplished in about 20 to 30 minutes, while processing an attack aircraft may take up to 45 to 50 minutes. In both instances, fueling takes 10 to 15 minutes and ordnance uploading takes up the rest of the time.

PMRF Parchute Landing Operations

Airborne paratrooper training operations are conducted at PMRF Main Base at established drop zones with approximately 328 feet (ft.) circular radius. Established drop zones on PMRF include ARDEL Circular Drop Zone (CDZ), Bunker CDZ, Golf Range CDZ, and Kukui CDZ (see Figure 1). These operations are associated with Joint training exercises, which build readiness,

strengthens partnerships, increases interoperability of militaries and sustains an effective combat force during real-world situations. Parachute operations are anticipated to occur 16 times per year.

PMRF UAS Launches

UAS launches may occur at the North Launch area, South Launch area and or UAS launch points around the airfield (see Figure 1). UAS's may be launched via hand launching or catapult launching with ground control system and flight vehicle. UASs may be fixed wing or rotary wing.

PMRF Command and Control Operations

Command, control, computing, communication, cyber, intelligence, surveillance, reconnaissance and targeting (C5ISRT) exercises generally invovles establishing and operating a tactical field command post to maintain connectivity and mission command in dyanmic environments that includes:

- Communication systems, Satellite Receivers/Transmitters: Radios for receiving and transmitting voice and data information.
- Radar Tracking and Surveillance Systems, Optical Tracking Systems: Surveillance acquistion and targeting during interceptor flight tests.
- Electronic Warfare Equipment (Vehicle mounted): Radio frequency detection equipment and mobile emitters, such as On-the-Move Networking systems.

PMRF Ground Maneuvers

Ground maneuvers include both on-foot and vehicular maneuvering throughout PMRF Main Base (see Figure 1). These include patrolling (of various types), linkup, passage-of-lines, and relief in place. These actions occur during offensive, defensive, and retrograde operations for different purposes. Units conduct terrestrial movement to land objectives along improved roads and pathways. It is anticipated that ground maneuver operations would occur approximately 22 times through a given year.

PMRF Bivouacking

Many of the training events occurring on PMRF Main Base include multiple agencies and multiple events. These events will increase the human presence on PMRF Main Base. During some training events, DoD personnel establish and operate expeditionary field lodging for personnel conducting training, known as bivouacking. These temporary camps support the training activities and will be disassembled and removed at the end of the training event.

Conservation Measures

Wildfire Mitigation

In order to minimize fire risk related to launches and live fire activities, the following wildland fire management activities are ongoing and will continue into the future:

- Ruderal areas around all launch pads are regularly mowed. The areas adjacent to pads are pre-soaked with water prior to a launch if determined to be necessary due to weather conditions.
- Access routes sufficient for fire crews are maintained to every launch pad.
- A standby team from Crash/Fire are present outside of the Ground Hazard Area prior to every launch and perform a hazard evaluation following every launch.
- Launches do not occur in very windy conditions.
- Helicopters are on standby during daytime launches equipped with a bucket for dipping seawater to respond quickly in the case of fire.
- Following each launch, the Crash/Fire team will investigate the launch site for hazards, conduct another evaluation and make a determination for action.

Hawaiian goose

Hawaiian geese are found on the islands of Hawai'i, Maui, Moloka'i and Kaua'i. They are observed in a variety of habitats, but prefer open areas, such as pastures, gold courses, wetlands, natural grasslands and shrublands, and lava flows. Threats to the species included introduced mammalian and avian predators, wind facilities, and vehcile strikes. To avoid impacts to Hawaiian geese, the Navy and their collaborators will implement the following measures:

- Nest surveys will occur in Drop Zones prior to parachute operations. If a nest is observed, an alternative Drop Zone location will be utilized.
- Radars used during flight tests will not be directed towards the ground and will have a lower limit of 4-5 degrees above horizontal, which would preclude electromagnetic radiation impacts on Hawaiian geese.
- PMRF will utlize a trained or tethered hazing dog in compliance with Section 4(d) requirements to more effectively haze non-brooding/molting Hawaiian geese within 500 ft. of a launch pad, with the Nest Removal Zone (NRZ) and basewide, which will reduce the need for nest removal.
- 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 to avoid nest removal.
- During events requiring a large increase in visiting personnel, PMRF will implement Hawaiian geese awareness and speed reduction measures to include:
    - Re-emphasize and highlight Hawaiian geese safety in "Orientation Brief" at Shore Support.

  - Increase temporary signage in areas with high Hawaiian geese 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.
- Avoid creating nesting habitat near the PMRF launch pagds by regularly clearing bushes, trees, shrubs, and short-stature grass (i.e., lawn).
- Perform weekly wildlife surveys and periodic nest searches with more frequent surveys during Hawaiian geese breeding season (September-March).
- Prior to testing/and or use of ARDEL facility, personnel will visually survey for Hawaiian geese within the area of impact, either by foot or by utilizing the facility's closed circuit television cameras.
- For percussive live firing events that exceed 140dBA at 1,500 ft., a 1,000 ft. distance will be maintained for Hawaiian geese.
- Hazing efforts will be increased prior to Hawaiian geese breeding season to avoid nesting within the proposed NRZ. Hazing efforts will be conducted by USDA-WS personnel, the Wildlfie Detection and Dispersal Team (WDDT) and if requested, the PMRF NR staff. The objective is to reduce successful nesting attempts within the NRZ to reduce nest removal, with a goal of 100% coverage within the NRZ during daylight hour.

Hawaiian waterbirds

Hawaiian waterbirds are currently found in a variety of wetland habitats including freshwater marshes and ponds, coastal estuaries and ponds, artiifical reservoirs, kalo or taro (*Colocasia esculenta*) lo'i or patches, irrigation ditches, sewage treatment ponds, and in the case of the Hawaiian duck, montane streams and marshlands. Hawaiian stilts may also be found wherever ephemeral or persistant standing water may occur. Threats to these species include non-native predators, habitat loss, and habitat degradation. Hawaiian ducks are also subject to threats from hybridization with introduced mallards. To avoid impacts to Hawaiian waterbirds, the following measures will be implemented:

- Radars used during flight tests will not be directed toward the ground and will have a lower limit of 4-5 degrees above horizontal, which would preclude electromagnetic radiation impacts on ESA-listed Hawaiian waterbirds.
- Training activities will not modify or destroy habitat.
- Reduced speed limit around Kinikini Ditch.
- Open north gate during large training events.
- For percussive live firing events that exceed 140dBA at 1,500 ft., a 1,000 ft. distance will be maintained for Hawaiian waterbirds.

Hawaiian seabirds

Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and inury or mortality. Seabirds are attracted to lights and after circling

the lights they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobilies, starvation, and predation by dogs, cats, or other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in their first flights from their mountain nests to the sea, are particulary vulnerable to light attraction. To avoid and minimize potential impacts, the following measures will be incorporated by the Navy:

- Wildlife acoustic soundmeter surveys will be conducted on Ka'ula Island to determine presence of ESA-listed Hawaiian seabirds.
- If any of the ESA listed seabirds are detected during surveys, the Navy will notify the Service and conduct additional consultation as necessary. Additionally, the Navy will coordinate with the Service to develop conservation measures that promote the recovery of the species, if determine necessary to address threats to the species, while supporting military training on the island. The Navy would incorporate any such measures into the PMRF Integrated Natural Resources Management Plan.
- Radars used during flight tests at PMRF wil not be directed toward the ground and will have a lower limit of 4-5 degrees above horizontal, which would preclude elcetromagnetic radiation impacts on ESA-listed seabirds.
- Adhere to PMRF Dark Skies Program by turning off all unnecessary lighting from September 15 – December 15. Applicants must apply for waiver for required lighting.
- Launch activities will be conducted to the maximium extent practicable outside of peak seabird fledging season.

Hawaiian Hoary Bat

The Hawaiian hoary bat roost in woody vegetation across all islands 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. Hawaiian hoary bats 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. To avoid impacts to the Hawaiian hoary bat, the Navy, and their collaborators will implement the following measures:

- Radars used during flight tests at PMRF will not be directly toward the ground and will have a lower limit of 4-5 degrees above horizontal, which would preclude electromagnetic radiation impacts on ESA-listed Hawaiian hoary bat.
- There will be no trimming or removal of trees 15 ft. or taller during the Hawaiian hoary bat pupping season (June 1-September 15).
- Launch areas are maintained free of flammable vegetation and therefore have minimal fire potential.
- Prior to all launches and live-fire events, areas adjacent to pads are pre-soaked with water to reduce the risk of fire.
- Emergency fire crews will be available during launches to quickly extinguish any fire and minimize its effects.

- Prior to operating radar units at nighttime, personnel will visually survey for bats in the area of impact using a wildlife acoustic recording meter. If a bat is present, RF emission will not begin until bats have left on their own accord.
- Barbed wire shall not be used.

Green Sea Turtle and Hawksbill Sea Turtle

Green sea turtles may nest on any sandy beach area in the Pacific Islands. Hawksbill sea turtles exhibit a wide tolerance for nesting substrate (ranging from sandy beach to crushed coral) with nests typically placed under vegetation. Both species exhibit strong nesting site fidelity. Nesting occurs on beaches from May through September, peaking in June and July, with hatchlings emerging through November and December. Off-road vehicle traffic may result in direct impacts to sea turtles or nests and contributes to habitat degradation through erosion and compaction. To avoid and minimize effects to green sea turtles, the Navy, and their collaborators will implement the following measures:

- Radars used during flight tests at PMRF will not be directed towards the ground and will have a lower limit of 4-5 degrees above horizontal, which would preclude electromagnetic radiation impacts on ESA-listed green sea turtle.
- All C5ISRT activities at North Launch Sites ½, South Launch Site and the Missile Defense Agency (MDA) Hardstand will be conducted at least 284 ft. (Electromagnetic Radiaton [EMR] hazard area) from the nearest beach which would preclude electromagnetic radiation impacts on ESA-listed green sea turtle.
- Within 1 hour prior to the commencement of an amphibious landing exercise, observer(s) shall survey affected beaches for sea turtles and sea turtle nesting sites. Sea turtle nesting sites shall be marked and no trespassing by persons or vehicles within 50 ft. of the nest shall be allowed.
- Should turtles be found on the beach, the landing shall be delayed until the animal(s) have voluntarily left the area or moved to another location free of such animals.
- Landing craft and Amphibious Assault Vehicle crews shall be ade aware of the potential presence of these endangered and threatened species.
- Amphibious beach landings at PMRF will take place only on specific routes at Waiapuaa in order to minimize impacts.
- PMRF NR staff survey PMRF beaches weekly, to search for turtle presence and turtle activity (tracks, digs, nests) and will flag, monitor and protect turtle nests.
- PMRF security forces patrol PMRF beaches by vehicle, daily. They are trained by NR staff to look for signs of turtle activity and report activity. They avoid driving below the high tide line, on sand dunes and on vegetation.
- Night lighting will be shielded to the extent practical to minimize effects on green sea turtles. Avoid coastal facing lighting from May to October.
- No bivouacking will take place near turtle nesting or basking areas.
- For percussive live firing events that exceed 140dBA at 1,500 ft., a 1,500 ft. distance will be maintained for turtles.

Panicum niihauense and designated Critical Habitat

Project activities such as increased vehicle use, human traffic, and wildfires may affect *Panicum niihauense* by causing physical damage to plant parts (i.e., roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat, which may reduce germination, growth, and/or reproduction, or the ability to absorb water and nutrients. Soil disturbance or removal can negatively impact the soil seed bank of *P. niihauense* when it is present or has historically occured in a project area. Damaging or destorying *P. niihauense* may also increase the risk of invasion by nonnative plants. To avoid impacts to *P. niihauense*, the Navy will implement the following measures:

- On-foot and vehicular movement is restricted to existing routes, to avoid sensitive areas.
- Security vehicles are driven only on existing dirt roads inland of designated *P. niihauense* cirtical habitat and any secuity vehicles entering the beach area are required to cross the berm only on designated permanent paths indicated by signs.
- DoD personnel will comply with relevant Navy policies and procedures during training operations to limit the potential for introduction of invasive weed plant species.
- All personnel, tenants and users of PMRF launch sites are given a brief on natural resources found at Barking Sands, including endangered species requirements, to avoid, report and protect ESA-listed species observed near launch sites during a training event.

Portulaca villosa

Project activities may affect listed plant species by causing physical damage to plant parts (roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat, which may result in reduction of germination, growth and/or reproduction. To avoid impacts to *Portulaca villosa,* the Navy will implement the following measures:

- Drone surveys of Kaʻula Island will be conducted to determine the presence and distribution of *P. villosa.*
- If *P. villosa* is detected during surveys, the Navy will notify the Service and conduct additional consultation as necessary. Additionally, the Navy will coordinate with the Service to develop conservation measures that promote the recovery of the species, if determined necessary to addresss threats to the species, while supporting military training on the island. The Navy would incorporate any such measures into the PMRF Integrated Natural Resources Management Plan.
- No explosives are used (inert only) for training at Kaʻula Island.

Analysis of Effects on Listed Species

Hawaiian goose

Hawaiian geese are present year-round at PMRF. They occur throughout PMRF but are most commonly observed in open grassy areas in the central and southern portions of PMRF, and at the oxidation pond complex (adjacent to MDA Hard Stand and South Launch Area), beach cottages, and Kinikini Ditch. Hawaiian geese are not present on Kaʻula island. The occurrence of Hawaiian geese on or near the PMRF airfield increases the Bird/Aircraft Strike Hazard (BASH) potential (e.g., from helicopter and FARP operations), and they are discouraged from nesting and

being present in the Airfield Operating Area (AOA) and surrounding areas. The proposed parachute operations could cause stress to Hawaiian geese by causing physical disturbance, direct strikes, and/or noise disturbances. The avoidance and minimization measures implemented by the Navy, such as vegetation management and hazing would prevent the creation of desirable habitat and discourage breeding or loafing in the area. Other measures such as surveying for Hawaiian geese nests at training sites prior to training, visitor awareness, and speed reduction measures are likely to avoid harm to the species. For these, reasons, Hawaiian geese are not likely to be in the area during launches or on the airfield or helipads during operations. Therefore, effects to Hawaiian geese are discountable.

Hawaiian waterbirds

Hawaiian waterbirds utilize aquatic environments, which are only present in the southern and central portion of Barking Sands. Hawaiian waterbirds have not been observed near launch and live fire sites dues to the lack of suitable habitat for foraging and nesting. Parachute operations can cause stressors to Hawaiian waterbirds such as physical disturbance, direct strike, and noise disturbance. The avoidance and minimization measures implemented by the Navy, such as not directing radars toward the ground, not modiying or destroying habitat, reducing vehicle speed limits, and keeping a 1,000 ft. distance from Hawaiian waterbirds will reduce stressors to Hawaiian waterbirds. Additionally, wildfire mitigation conservation measures would lower the likelihood of wildfire ignition or wildfires reaching waterbird habitat. Hawaiian waterbirds do not occur on Kaʻula Island. Due to the lack of presence near the action area and by implementing the conservation measures above, adverse effects to Hawaiian waterbirds are highly unlikley to occur. Therefore, effects to Hawaiian waterbirds are discountable.

Hawaiian seabirds

Hawaiian seabirds forage at sea during the day and will come back to their higher elevation nesting burrows at night during the breeding season (May-October). The proposed training actions could cause stressors to Hawaiian seabirds such as physical disturbance, direct strikes, noise disturbances, radio frequency radiation, pressure, thermal activity, reduced air quality, fire, habitat modification, and or electromagnetic radiation. The avoidance and minimization measures implemented by the Navy such as not directing radars toward the ground, adhering to the PMRF Dark Skies Program, and conducting launch activities outside of peak seabird fledging season to the maximum extent practicable will reduce the risk to Hawaiian seabirds. Due to their daily migration between inland Kauaʻi and the marine environment, as well as PMRF's coastal location, there is a very low likelihood that these species could be exposed to the stressors associated with the parchute, radar, helicopter, FARP, launches, live-fire, and UAS while flying over PMRF. The chances that a seabird species would move in the same direction and at the same speed as the constant beam while tracking a target, and therefore be exposed to potentially damaging levels of radiation, are extremely small. Considering these factors, and the conservation measures being implemented, adverse effects to Hawaiian seabirds from the proposed action at PMRF are highly unlikely to occur. Therefore, effects to Hawaiian seabirds at PMRF are considered discountable.

Hawaiian seabirds have not been documented on Kaʻula Island after extensive ground surveys conducted in 1932, '71, '76, '78, '79, '80, '84, '83, '93, and '98. Additionally, aerial imagery surveys conducted every two years since 2013 have not detected ESA listed Hawaiian seabirds. In order to verify if the ESA listed seabirds are around Kaʻula Island during the breeding season, the Navy will conduct acoustic surveys to determine presence. If any of the ESA listed seabirds are detected during the surveys, the Navy will notify the Service and conduct additional consultation as necessary.

Due to the lack of presence of Hawaiian seabirds at Kaʻula Island, adverse effects to Hawaiian seabirds are highly unlikely to occur. Therefore, effects to Hawaiian seabirds at Kaʻula Island are considered discountable.

Hawaiian hoary bat

Several avoidance and minimization measures would be implemented for Hawaiian hoary bats including avoiding tree trimming during the pupping season and implementing wildfire prevention strategies. Effects such as physical disturbance, direct strikes, electromagnetic radiation, and noise are localized, intermittent, and short-term. Hawaiian hoary bats are not likely utilizing the area because vegetation surrounding PMRF Main Base launch sites are dominated by invasive kiawe and koa haole which do not form a closed canopy and are not likely to be used as roosting habitat. Adult Hawaiian hoary bats, if in the area, would likely flush from the area prior to launches, prompted by prior anthropogenic disturbance. Juveniles are unlikely to be affected because launch-associated effects are unlikely to extend into areas where they may be present. No trimming or removal of trees over 15 ft. tall will be conducted during the bat pupping season (1 June – 15 September). For effects to occur due to electromagnetic radiation, a bat would need to hover within the radar beam for an extended period of time. Hovering is not a known behavior of bats, so exposure is unlikely. Additionally, due to the lack of suitable habitat, Hawaiian hoary bats are not known to be present on Kaʻula Island. Considering these factors, and the conservation measures being implemented, adverse effects to the Hawaiian hoary bat are highly unlikely to occur. Therefore, the effects to the Hawaiian hoary bat are considered discountable.

Green sea turtle and Hawksbill sea turtle

Green sea turtles occur year-round on PMRF Barking Sands and regularly utilize the installations beaches and nearshore waters for nesting, basking, and foraging. There are no records of hawksbill sea turtles coming onto shore to bask or nest at Barking Sands. No suitable shoreline habitat exists for turtles to utilize on Kaʻula Island, so they are not considered present there. Sea turtles are extremely unlikely to be exposed to launch-related effects as the launch pad is greater than 550 ft. away from the closest beach historically known to be occupied by nesting sea turtles. Sea turtles could be impacted by activities such as amphibious exercises and artificial lighting. The avoidance and minimization measures implemented by the Navy such as conducting all C5ISRT activities at least 284 ft. from the nearest beach, surveying beaches for sea turtles within 1 hour of amphibious landing exercises, and shielded night lighting will reduce the risk to green sea turtles and hawksbill sea turtles. Considering these factors, and the conservation measures

being implemented, adverse effects to the green sea turtle and hawksbill sea turtle are highly unlikely to occur. Therefore, effects to green sea turtle and hawksbill sea turtle are discountable.

Pannicum niihauense and Designated Critical Habitat

Pannicum niihauense does not occur on Ka'ula Island. Previous surveys of PMRF have not detected *P. niihauense* within PMRF Barking Sands boundaries. In 2023, four individuals were identified just north of PMRF at Polihale State Park. Designated critical habitat for *P. niihauense* does not overlap with the proposed training and testing areas at PMRF Barking Sands. The avoidance and minimization measures implemented by the Navy such as restricting foot and vehicular movement and using only existing dirt roads inland of designated *P. niihauense* critical habitat will reduce the risk to *P. niihauense* and its critical habitat. The launch-related effects would not extend into areas occupied by *P. niihauense* or designated critical habitat. Wildfire prevention strategies would reduce the likelihood of wildfire spreading into designated critical habitat for *P. niihauense*. Considering these factors, and the conservation measures being implemented, adverse effects to *P. niihauense* and its designated critical habitat are highly unlikely to occur. Therefore, effects to *P. niihauense* and its designated critical habitat are discountable.

Portulaca villosa

Portulaca villosa was listed as endangered in 2016 and is historically known to occur on Ka'ula Island. The first documented botanical surveys of Ka'ula Island were conducted in August 1932 where *P. villosa* was described as being found "on the ridge, most commonly on the northern half, where mats 12-14 inches in diameter were found". Botanical surveys in 1971, 1976, and 1978 described the plant as only occasionally observed. The last ground survey in 1998 identified *P. villosa* as being present with no other details on individuals or locations. The Navy conducts inert or non-explosive practice ordnance only on the southern tip of the Ka'ula Island. The Navy will conduct drone surveys of Ka'ula Island to determine any presence and distribution of *P. villosa*. If *P. villosa* is detected during surveys, the Navy will notify the Service and conduct additional consultation as necessary. Based on previous surveys, the presence of *P. villosa* in the action area is highly unlikely. Therefore, effects to *P. villosa* from the proposed action are considered discountable.

Summary

We have reviewed our data and conducted an effects analysis of your project. By incorporating the conservation measures listed above, effects to the Hawaiian goose, Hawaiian waterbirds, Hawaiian seabirds, Hawaiian hoary bat, green sea turtle, hawksbill sea turtle, *Pannicum niihauense* and its designated critical habitat, and *Portulaca villosa* are extremely unlikely to occur and are therefore considered discountable. Because impacts from the proposed action are considered discountable, the Service concurs with your determination that the proposed action may affect, but is not likely to adversely affect the Hawaiian goose, Hawaiian waterbirds, Hawaiian seabirds, Hawaiian hoary bat, green sea turtle, hawksbill sea turtle, *Pannicum niihauense* and its designated critical habitat, and *Portulaca villosa*.

We appreciate your efforts to conserve endangered species. If you have questions regarding this letter, please contact Deena Gary, Fish and Wildlife Biologist (phone: 808-792-9400 or email: deena_gary@fws.gov). When referring to this project, please include this reference number: 2025-0011513.

Sincerely,

LORENA WADA

Digitally signed by LORENA WADA
Date: 2024.12.03 12:38:06 -10'00'

Lorena Wada
Planning and Consultation Team Manager

cc: Kimberly O'Connor
Brian Whitehouse
Daniel Mcnair
Joan Malik
Scott Upright
Gilbert Serrano
Kristine Barker
Cory Campora
Matthew Burt
Brooke Mcfarland
Brianne McNair

C.5 National Historic Preservation Act

C.5.1 U.S. Department of the Navy to State Historic Preservation Officer

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0559
September 4, 2024

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

Dear Ms. Chang:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Pacific Missile Range Facility wishes to notify SHPO of the Navy's intent to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

Consistent with 36 CFR § 800.2(a)(2), the Navy is designated as lead Federal agency for this undertaking on behalf of the following agencies: the Missile Defense Agency (MDA), United States Army, United States Air Force, United State Marine Corps. The proposed undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties will be avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapua'a Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Kaula Island (Figure 1). The Kauai Test Facility and routine airfield operations at PMRF are not part of this undertaking, nor are activities at Makaha Ridge, Port Allen, Kokee, and Niihau Island.

Implementation of the 2012 PA

In accordance with Stipulation IX., a qualified Navy cultural resources professional will conduct and/or oversee the training to ensure the following measures are incorporated:

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

a. Review each training evolution in advance to confirm that standard protective measures are appropriately incorporated into training and testing activities and are effective in protecting historic properties from adverse effects.

b. Initiate consultation with SHPO and NHO if the Navy determines that historic properties may be affected (Stipulation IX.C).

c. Provide SHPO with quarterly reports of activities reviewed under the 2012 PA, in addition to the annual report (Stipulation XII).

Pre-training and testing protective measures performed by qualified Navy professional include:

Conduct briefings to operational personnel for cultural resource sensitivities prior to training exercises. Ensure range users are informed regarding the following:

a. Archaeologically sensitive areas, importance of avoidance, and how to recognize cultural resources.

b. Discovery or inadvertent damage of cultural resources within training areas must be reported immediately.

c. ARPA Compliance: removal of historical, cultural, or archeological objects is prohibited and punishable by law.

d. Contact information for the Navy CRM.

Requirement that should unanticipated cultural resources be encountered; all activities will cease in the immediate vicinity of the find and reported to the Navy CRM.

a. Inadvertent discovery of Archaeological Remains.

b. Inadvertent discovery of Human Remains.

(1) Consultation with NHOs is required if Native Hawaiian remains are encountered or suspected.

(2) No photography or movement of osteological materials, secure area, and call Navy CRM.

Fire suppression communication.

a. Navy CRM communicates with range personnel regarding emergency management procedures.

2

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Monitoring during construction and/or ground-disturbing activities.

a. Navy CRM carries out field checks prior to amphibious operations and other operations to ensure avoidance of historic properties.

Range Users are required to stay on designated pathways without deviation.

Vehicles are restricted to established roads. No off-roading or driving on beaches without Navy approvals.

Navy CRM supports pre-exercise pedestrian survey relative to the proposed action.

Range users lay down rubber mats during amphibious operations. Rubber mats are used in the area where small boats come ashore to prevent disturbance to resources in the sand. During small boat operations, a four-wheel drive pickup truck and trailer are used to transport the small boats (Combat Rubber Raiding Craft) briefly across the rubber mats to hardened landing area access road.

Post-training and testing protective measures performed by the qualified Navy professional include:

Attend after action de-briefing for training activities and unanticipated incidents.

Post-exercise survey of area, triggered by unexpected fires or mishap.

Field checks after amphibious operations and other operations to ensure avoidance of historic properties.

Post-exercise pedestrian survey relative to the proposed action.

Reporting on unanticipated finds discovered during training activities.

The Navy is also notifying Native Hawaiian Organizations that have previously indicated to the Navy that PMRF holds religious or cultural significance regarding the proposed undertaking, and the planned implementation of the 2012 PA.

If SHPO has concerns or objections, the Navy respectfully requests a reply within 30 days of receipt. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.09.04 15:47:15 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

3

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Copy to: Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawaii Environmental Director

Enclosure 1: Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). 2012 PA

4

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

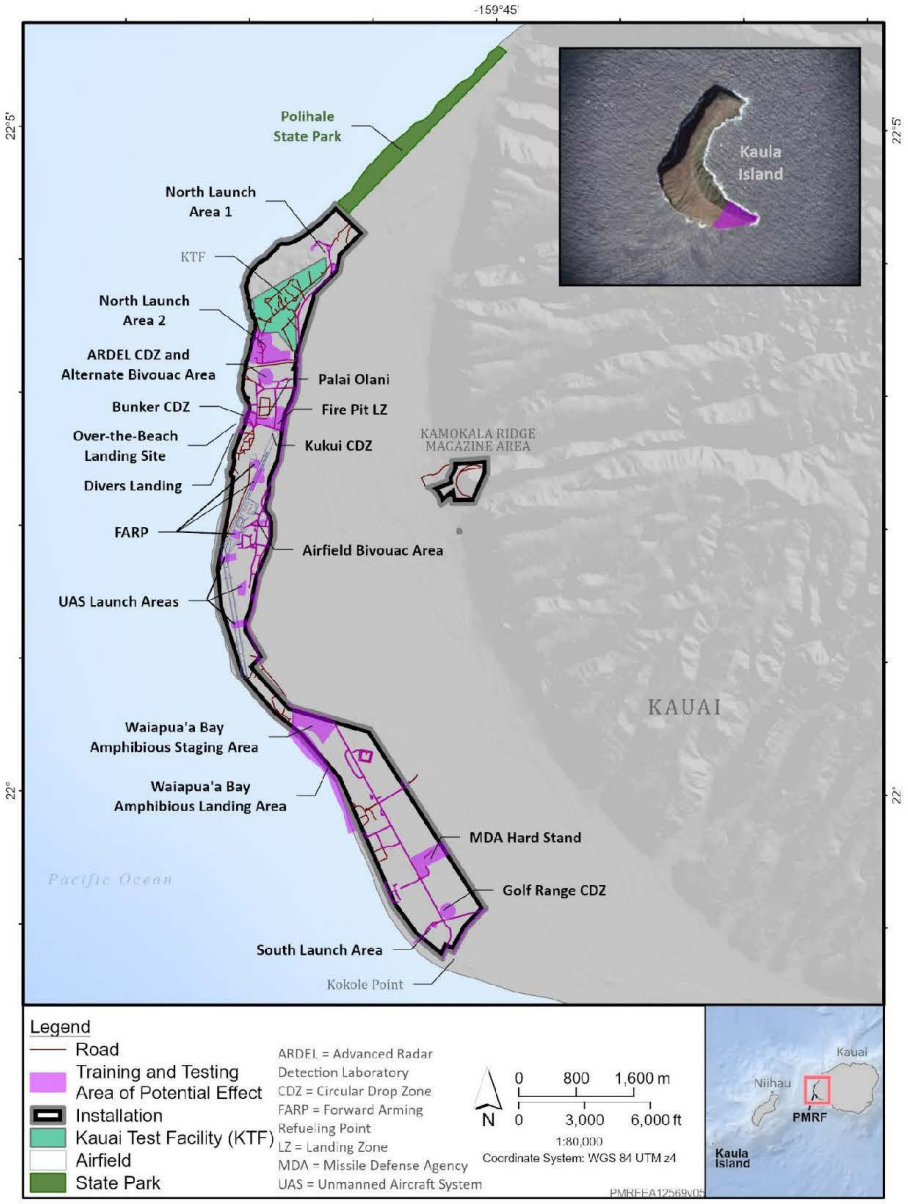


Figure 1: PMRF Land Based Training and Testing Areas

5

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0654
08-Nov-24

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

Dear Ms. Chang:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Consistent with Pacific Missile Range Facility ltr SER N4F/0559 of 4 September 2024 (HICRIS Project No. 2024PR01077) and the October 23, 2024 meeting between Navy and State Historic Preservation Division (SHPD) staff, this letter provides additional information about how the Navy will implement the 2012 PA in response to questions and concerns about the potential presence of Traditional Cultural Properties (TCPs) on Kaʻula Island. The Navy intends to share information from prior investigations and engage with Native Hawaiian stakeholders and SHPD to identify any additional historic properties, assess effects, and, if necessary, resolve any potential adverse effects as stipulated in the 2012 PA.

To recap, the proposed undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties will be avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapuaʻa Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Kaʻula Island.

Specific to Kaʻula Island, the area utilized for training is the existing 10-acre inert impact area located on the southern end of the island (Figure 1). The training on Kaʻula Island is important to future military capability in maritime conflict where islands can serve as strategic and logistic hubs. The continued usage remains occasional. It serves as a contingency air to ground area for the Navy deploying units that may need to complete required training/qualifications in Hawaii. The proposed increased use of Kaʻula for training provides Air Force, Army, and Marine Corps the required expanded capability to train in a maritime environment; and this location offers local units an opportunity they have not had in the past.

The Navy recently requested comments from the public on a draft environmental assessment and under Section 106 of the National Historic Preservation Act regarding PMRF Land Based Training and Testing (LBTT). The Navy received comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Kaʻula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana the Shark God who lives in a large underwater cave known as Hālauaola. According to *Final Report Archaeological Survey of Kaʻula Island, Hawai'i* (Prepared in 2001 by J. Robins and L. Anderson for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i), historic accounts suggest Hawaiians visited the island for collection of natural resources, including stone used in traditional octopus lures. *Final Report Kaʻula Island, Hawaiʻi: A Study of Potential Native Hawaiian Traditional Cultural Places* (prepared in 2004 by Tuggle, D. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawaiʻi) also identified cultural traditions and place names associated with Kaʻula Island. In response to comments received regarding historic properties on Kaʻula, the Navy intends to engage with Native Hawaiian Organizations, the Office of Hawaiian Affairs, and SHPO to gather additional information about Kaʻula Island, as outlined in Stipulation VII.C. of the 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaiʻi State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended.

During a recent meeting, SHPD staff requested additional information about existing surveys of the training area and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties. Accordingly, the Navy intends to engage with SHPD staff on past surveys and potential additional survey methodologies.

If you have questions or comments regarding this additional information, the point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.12 14:13:05 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Dr. Susan Lebo, State Historic Preservation Division
Ms. Jessica Puff, State Historic Preservation Division

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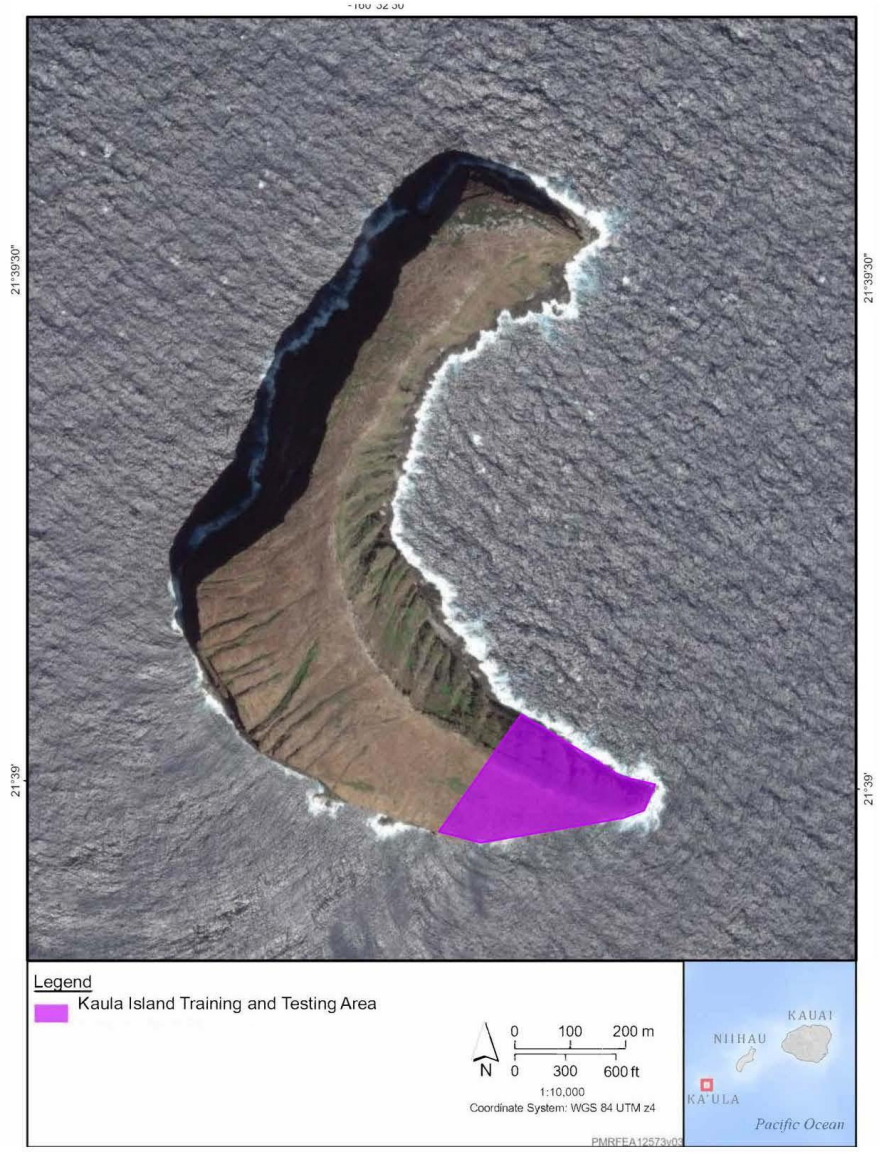


Figure 1: Ka'ula Island. Inert Target area shown in purple.

3

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0126
26-Feb-25

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI (HICRIS Project No. 2024PR01077)

Dear Ms. Chang:

In furtherance of the Navy's efforts to evaluate historic properties on Kaʻula Island and as discussed in the November 08, 2024 letter (Enclosure 1), this letter updates you on the steps taken to gather additional information from Native Hawaiian Organizations (NHOs) and interested parties on the potential presence of Traditional Cultural Places (TCPs) on Kaʻula Island. Since November 2024, the Navy has conducted multiple meetings with interested parties, many of whom are NHOs. The Navy shared information about prior surveys of Kaʻula Island, conducted additional information gathering and research, and engaged with NHOs to gather input regarding traditional knowledge and cultural practices pertaining to Kaʻula Island.

Consistent with Stipulation VII.C of the 2012 PA (Reference 1), the Navy applied the National Register Criteria (36 C.F.R. § 60.4), and determined that Kaʻula Island meets the criteria of a Traditional Cultural Place eligible for listing under National Register Criterion A (Events) as an association with "events that have made a significant contribution to the broad patterns of [Native Hawaiian] history." Kaʻula Island is also eligible for inclusion in the National Register of Historic Places (NRHP) under Criteria B (Persons) for its association with the lives of significant persons (i.e., ancestors, mythical figures) and D (Information Potential) for its potential to provide information about Hawaiʻi's historical past.

IDENTIFICATION OF HISTORIC PROPERTIES

Kaʻula Island is on the earliest maps of Hawaiʻi and referenced in many traditional Hawaiian texts. The island is a crescent-shaped islet approximately 22 miles southwest of Niʻihau (Figure 1). The 113-acre island is about 1.5 km long and 100-300 m wide and the highest point on the island is near the center. The island has steep sea cliffs on its sides and the rough seas and rocky shorelines make it hard to reach by boat.

A limited number of archaeological studies have taken place on Kaʻula Island due to its remote location and difficulty to access by vessel or by air. The Navy submitted these studies to SHPD via HICRIS. Dr. Robert Hommon of the State Parks Historic Sites Division of the DLNR conducted the earliest survey of Kaʻula Island in 1976 (Reference 2). Dr. Hommon identified four sites on the island, including a cave, low mounds, a terraced platform, and a lighthouse

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

foundation. Two sites were located on the northern end of the island and two sites were near or on the summit (at center of island).

The Navy conducted a pedestrian survey of accessible areas of the island in 1999 (Reference 3). This survey identified six archaeological sites, five located on the northern end of the island and one on the summit. Please see a summary of the sites and the associated findings in Table 1 below. The Navy observed three of the sites identified by Dr. Hommon. The cave site recorded by Hommon was not found, and the portion of the cliff where the cave was located showed evidence of collapse due to erosion. Neither survey (1976, 1999) identified archaeological sites at the southern end of the island.

In 2004, the Navy conducted a study to identify potential TCPs on Kaʻula Island. The study relied on historical accounts, traditional Hawaiian texts, historical maps, ethnographic reports, and interviews with Hawaiian community members (Reference 4). The study identified three places as potential TCPs: (1) Kaʻula Island, (2) Keanaokū (also called Kūhaimoana), a cave recognized as home to a shark god, and (3) Kahālauloa, a heiau (sacred Hawaiian temple). Recent engagement with NHOs corroborates many of the findings in the 2004 TCP report.

Table 1: Summary of Archaeological Sites on Kaʻula Island

Site number	Site Feature(s)	Site Types	Probable Functions
50-70-99-01	Concrete foundation, historic materials	Historic era	Former U.S. Coast Guard lighthouse, 1932-1948
50-70-99-02	Terrace, stone rubble walls, modified cave, artifacts related to stone production (core and hammerstone), and branch coral	Hawaiian	Short-term habitation and/or used for ceremonial functions
50-70-99-03	Mound and two circular enclosures associated with short-term habitation; modern materials	Hawaiian; Historic era	Short-term habitation and/or used for ceremonial functions, and historic shelter
50-70-99-04	Two mounds and a rectangular-shape depression; modern materials	Hawaiian; Historic era	Possible remnant of Hawaiian structure, location appears to correlate with heiau on 1923 photograph (Reference 3: Figure 9)
50-70-99-05	Mound	Unknown	Lacked sufficient integrity for an interpretation of function and cultural affiliation
50-70-99-06	Cave with traditional Hawaiian octopus lure sinker preform made from locally	Hawaiian; Historic era	Utilized as a shelter and short-term habitation

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

	sourced olivine nodule; modern materials		

ENGAGEMENT WITH NATIVE HAWAIIAN ORGANIZATIONS

In accordance with Section VII.C. of the 2012 PA, the Navy is considering input from NHOs regarding additional historic properties on Kaʻula Island and has contacted NHOs, the Office of Hawaiian Affairs, and members of the academic community that may be able to share information about the historic and cultural significance of Kaʻula Island (Table 2). The Navy also invited NHOs to submit information in writing, if preferable.

A shared belief expressed by participating NHOs is that Kaʻula Island is a cultural resource, and the island is part of a landscape/seascape that is alive for the Hawaiian people. The island represents a familial connection to Hawaiians based on genealogical ties to the living environment. This connection is important because Native Hawaiians believe they must care for the island in similar fashion as they would care for their relatives. Kānaka Maoli, a term used to describe the native people of Hawaiʻi, have a reverential relationship with the living Earth. The cultural perspective of mālama ʻāina and aloha ʻāina, to care for the land and nature with sincere love and respect, is at the heart of Kānaka Maoli cultural traditions and customary practices.

According to Hawaiian tradition, Kaʻula Island is associated with cultural traditions related to the direction west, sunset, winter solstice, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, aliʻi (chief, nobility), fishing, navigation, migration, wind, transition, and symbolic associations of life and death.

The Native Hawaiian community knows Kaʻula Island as the location of Keanaokū, the cave of Kūhaimoana. This shark akua (god) or ʻaumakua (deified ancestor) is the traditional guardian of the waters of Kaʻula and Niʻihau. A large sea cave on the northwest side of Kaʻula Island is a key feature noted in interviews and historical accounts. NHOs also identify the presence of heiau on Kaʻula Island connected to the shark god. Some NHOs recognize that in the past three heiau were present nearby at a higher elevation east of the sea cave. The heiau Kahālauloa is likely the place Ka-hālau-a-Ola mentioned in several songs and chants and associated with the concept of revitalized life. Other heiau names include Kaneneʻeneʻe, Pahoku-pio, and Ka-unu. NHOs note the heiau and sea cave are places to perform cultural protocols.

Native Hawaiians have had a long-standing interaction with Kaʻula Island's natural environment. Participating NHOs recognize the island as a traditional place for intermittently collecting birds and feathers as well as olivine stone for fishing. Feathers collected from Kaʻula included those from the koaʻeʻula or red-tailed tropicbird. These feathers are considered special and were used in regalia. Native Hawaiians believe the island habitat serves as a nursery for birds, ensuring bird populations have a location to recover if needed. Birds from the island are essential because they help those fishing locate game fish in the area. NHOs maintain that natural resources on and around the island were vital support for the migration to and settlement of the Hawaiian Islands.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

The NHOs recognize the absence of human impact or presence on the island as indicative of the place's importance as wahi pana (sacred place). The more revered the location, the less traveled. Participating NHOs note visits to Kaʻula Island by members of the Hawaiian monarchy including Liholiho, Kalākaua, and Kapiʻolani. Some NHOs express strong interest in visiting Kaʻula Island to perform cultural protocols. Others expressed a desire to visit the island by ship only, being mindful to not contaminate the island or introduce invasive species.

The participating NHOs note Kaʻula Island is present in many Native Hawaiian mele (songs) and oli (chants). The island is often referred to in regards to vitality and life. Mele and oli also reference a canoe landing and two stone guardians on Kaʻula Island. In one chant, Kaʻula Island is referred to as "the house of wind." Some NHOs believe the island has a connection to the wind and its unpredictability.

Table 2: Native Hawaiian Contacts and Organizations

Contacts	**Organization/Association**
C. Kunane Aipoalani	Na ʻOhana Papa O Mānā
E. Kalani Flores	Flores-Case ʻOhana
Kamakana Ferreira	Office of Hawaiian Affairs
Kawaikapuokalani Hewett	Loea, Kumu Hula
Kekuewa Kikiloi	Nohopapa Hawaiʻi
Peleke Flores	Kiaʻi Kanaloa
Pelika Andrade	Nā Maka Onaona
Richard Keaoopuaokalani NeSmith	Researcher and Consultant
Robinson family	Niʻihau
Terrill James Kane Alii Williams	ʻOhana of Papapa of Niʻihau
Walter Ritte	ʻĀina Momona

DETERMINATION OF ELIGIBILITY

A traditional cultural place is defined as a building, structure, object, site, or district that may be eligible for inclusion in the NRHP for its significance to a living community because of its association with cultural beliefs, customs, or practices that are rooted in the community's history and that are important in maintaining the community's cultural identity (Ref. 5). Based on information provided by NHOs as well as archival, historical, and ethnographic research, the Navy has determined that Kaʻula Island is a site traditionally recognized as significant to Native Hawaiians because of its association with cultural beliefs, practices, and values. Native Hawaiian views related to Kaʻula Island are widely shared within the community and have been passed down through generations, thus serving an important role in maintaining the group's cultural identity.

While the Navy recognizes changes have taken place from historic activities, including lighthouse construction and military training activities, Kaʻula Island retains its integrity of location, setting, feeling, and association. The applicable National Register area of significance is Ethnic Heritage-Pacific Islander, Native Hawaiian. Kaʻula Island is historically important at the state level of significance with a period of significance from circa 1870 to present.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

As mentioned above, the Navy has determined that Kaʻula Island meets the essential characteristics of a TCP eligible for inclusion in the National Register (Reference 5). The Navy makes this assessment based on an understanding of the significance of Kaʻula Island as well as the physical and nonphysical aspects that characterize and convey the perspective of the Native Hawaiian community. Notably, the island itself possesses historical and cultural significance. Below is a list of character-defining features of Kaʻula Island with supporting information.

1. The island itself is associated with significant cultural traditions and events in Hawaiian history:
    - Kaʻula Island is a natural feature connected to the direction west, sunset, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, aliʻi, navigation, the wind, astronomy, transition, creation, and symbolic associations of life and death. Kaʻula is also part of Hawaiian astronomical architecture, and together with Niʻihau forms a winter solstice sightline from Kaunalewa Ridge on Kauaʻi;
    - The importance of Kaʻula Island as wahi pana is conveyed in creation stories, cosmology, and Native Hawaiian traditions of oli and mele. For NHOs, Kaʻula Island's physical location make it one of the older islands in the Hawaiian chain. Understood as a child of Papahānaumoku and Wākea, its origin, age, and genealogical ties to Native Hawaiians are a source of reverence; and
    - Native Hawaiians identify the island as essential to past traditional practice of collecting birds and feathers in addition to current practice of fishing in the waters surrounding Kaʻula Island and Niʻihau. NHOs note koaʻeʻula, or red-tailed tropicbirds, are specifically associated with Kaʻula and they identified birds of Kaʻula as a potential food supply and source for production of chiefly items, like ahuʻula (feather cape) or kāhili (feather standard).
2. Keanaokū, sea cave:
    - Home to the shark deity Kūhaimoana and an important place to perform cultural protocols.
3. Heiau (Kahālauloa, Kaneneʻeneʻe, Pahoku-pio, and Ka-unu):
    - Connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific;
    - Likely the place Ka-hālau-a-Ola in songs and chants and associated with the concept of revitalized life; and
    - Ethnographically associated with paying tribute to Kūhaimoana.

In consideration of the information provided above, and in accordance with Section VII.C. of the 2012 PA, Navy is now seeking concurrence from SHPO on this National Register eligibility determination of Kaʻula Island as a TCP for Section 106 purposes. The Navy respectfully requests SHPO's reply within 30 days of receipt or sooner. The Navy is also sending this letter to the above listed NHOs for comments on the TCP eligibility determination. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

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Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2025.02.26 14:49:43 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Jessica Puff, State Historic Preservation Division
Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawai'i Environmental Director
Kamakana Ferreria, Office of Hawaiian Affairs Lead Compliance Specialist

Reference 1: Programmatic Agreement among Commander, Navy Region Hawai'i, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawai'i. 2012.

Reference 2: *Field notes from Ka'ula Island*. Historic Sites Section, State Historic Preservation Division. Hommon, 1976.

Reference 3: *Final Report Archaeological Survey of Ka'ula Island*. Prepared by Ogden Environmental and Energy Services Co., Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i. Robins and Anderson, 2001.

Reference 4: *Final Report Ka'ula Island, Hawai'i: A Study of Potential Native Hawaiian Traditional Cultural Places*. Prepared by International Archaeological Research Institute, Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i Tuggle, 2004.

Reference 5: *National Register Bulletin: Identifying, Evaluating, and Documenting Traditional Cultural Places*. Update to National Register Bulletin 38. Issued by the National Register of Historic Places and National Historic Landmarks Program. National Park Service, U.S. Department of the Interior, 2024.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I



Figure 1: Map of Ka'ula Island Traditional Cultural Place

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DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0370
04-Jun-25

Ms. Dawn Chang
Chairperson, Department of Land and Natural Resources
State Historic Preservation Division
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawai'i 96813

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I (HICRIS Project No. 2024PR01077)

Dear Ms. Chang:

The purpose of this letter is to provide an update on the Navy's continuing efforts to meet its responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Navy's 2012 PA, as amended in 2024 (Reference 1) (hereinafter "2012 PA"). This letter provides the State Historic Preservation Officer (SHPO) with an opportunity to review the proposed area of potential effect (APE) and finding of effect for proposed activities on Ka'ula Island. As discussed in the letter dated February 26, 2025 (Reference 2), the Navy determined Ka'ula Island meets the criteria of a Traditional Cultural Place (TCP) eligible for listing in the National Register of Historic Places (NRHP) (hereinafter "Ka'ula Island TCP"). The Navy has received no official response from the SHPO to the determination of eligibility and no objections from any other consulting parties. As the 30-day review period has now closed, the Navy accepts the absence of SHPO response as concurrence with the determination.

The proposed undertaking includes training and testing activities conducted within established ranges at Pacific Missile Range Facility (PMRF) and at Ka'ula Island. The type of activities is consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. Specific to Ka'ula Island, proposed training would occur within the existing 10-acre inert impact area on the southern end of the island. The proposed undertaking may increase the number of annual air-to-ground gunnery exercises and air-to-ground bombing exercises from the Navy's historical average of 6 to a maximum of 24 and from 7 to a maximum of 31, respectively. Ka'ula Island serves as a contingency air-to-ground area for the Navy deploying units that may need to complete required training qualifications in Hawai'i. The proposed increased use of Ka'ula for training provides Air Force, Army, and Marine Corps the required expanded capability to train in a maritime environment; and this location offers local units an opportunity they have not had in the past.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

AREA OF POTENTIAL EFFECT

Kaʻula Island is a crescent-shaped islet approximately 22 miles southwest of Niʻihau. The 113-acre-island is about 1.5 km long and 0.1-0.3 km wide, and the highest point on the island is near the center. Training activities are limited to the 10-acre inert impact area located on the southern end of the island. In consultation with your office and Native Hawaiian stakeholders, the Navy has determined the island is a TCP eligible for listing in the NRHP due to its association with significant cultural traditions and events in Hawaiian history. Therefore, the Navy proposes the entire island comprises the APE for the purposes of this consultation (Figure 1). In compliance with Stipulation VI of the 2012 PA, the Navy requests SHPO's review of the proposed APE for proposed training activities on Kaʻula Island.

ENGAGEMENT WITH NATIVE HAWAIIAN ORGANIZATIONS

As part of ongoing engagement efforts pursuant to the 2012 PA, the Navy met with Native Hawaiian Organizations (NHOs), including the Office of Hawaiian Affairs, to seek input on the potential effects of proposed training to the Kaʻula Island TCP. In addition to the information that was shared during the meetings, the Navy also invited NHOs to submit information in writing. The Navy's proposed finding of effect considers the input and views expressed by NHOs participating throughout the Navy's Section 106 consultation engagement efforts. A summary of NHO input is included in Enclosure 1.

FINDING OF EFFECT

In accordance with Section IX of the 2012 PA, the Navy completed a review to determine whether the proposed undertaking has the potential to cause effects to the Kaʻula Island TCP. The review focused on potential effects caused by proposed activities to the TCP's three character-defining features: the physical island itself, the sea cave, and heiau (sacred Hawaiian temple). Kaʻula Island is associated with significant cultural traditions, practices, and events in Hawaiian history. The sea cave Keanaokū is home to the shark deity Kūhaimoana and an important place to perform cultural protocols and practices. The large sea cave is on the upper northwest side of the island. Heiau on the island, generally, are connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific. As many as three heiau are identified in reports, historical accounts, and recent meetings, all are described as being on the northern side of the island (Reference 3; Reference 4). Consistent with past training activities, future training is limited to the 10-acre inert impact area on the southern end of the island.

Per 36 C.F.R. § 800.5(a)(1), an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. The aspects of integrity contributing to the eligibility of Kaʻula Island are location, setting, feeling, and association.

Potential effects to the sea cave and heiau would be avoided because these features are on the island's northern side, well outside the area where proposed training activities would take

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

place. Since the proposed undertaking includes no new areas or new types of training activities, no direct or indirect effects are expected to impact the northern side of the island where the sea cave and heiau exist. Thus, the proposed undertaking will not alter these character-defining features allowing them to retain their integrity of location, setting, feeling, and association.

The review also focuses on potential effects on the island itself. Specifically, the impacts to natural or physical features of the island and its associated cultural traditions are key interest areas raised by the consulting parties that warrant investigation. To assess the potential for physical damage to Kaʻula Island, the Navy reviewed reports and high-resolution aerial photography of the island with a detailed inspection of the inert impact area. Photographs show remnants of inert munitions largely resting on the ground surface with a small number embedded into the ground because an inert round fired does not have the same percussive impact of an explosive round. Cratering or significant physical disturbances to the ground surface from the impacts are not detectable in the aerial views. The analysis suggests that use of inert ordnance results in minimal physical damage to the island, thus having no adverse effects on this aspect of Kaʻula Island's integrity.

Another potential effect includes the introduction of visual, atmospheric, or audible elements that could diminish the integrity of the historic property. Although audible elements are expected to occur during proposed training, these sounds would be brief and temporary and would not rise to the level of adverse effect. Visual and atmospheric elements introduced during proposed training on Kaʻula Island include debris from inert munitions. As cleanup of inert munitions is not part of proposed activities, the accumulation of inert munitions debris affects aspects of integrity such as setting and feeling of the island. Setting is the physical environment of the TCP and refers to the character of the place in which the property played its historical role. Kaʻula Island is regarded by participating NHOs as wahi pana, a sacred place celebrated and storied in the cultural traditions of Hawaiʻi. The island is noted for its sacred and remote landscape as well as natural resources traditionally utilized by Native Hawaiians such as birds, their eggs and feathers, and olivine stones used to make fishing lures. The expended munitions remaining on the island is not congruent with the basic physical conditions understood historically as a revered landscape. Feeling is a nonphysical aspect of integrity that is a place's expression of the aesthetic or historic sense of a particular period. Participating NHOs regard Kaʻula Island as a family member, and the presence of physical and natural features, collectively, reflect Native Hawaiians' spiritual values and genealogical ties. Our review of potential effects, along with consideration of NHO perspectives, indicates that the proposed increase in activities will introduce additional visual and atmospheric elements that diminish the integrity of setting and feeling and will adversely affect the Kaʻula Island TCP.

Lastly, the Navy's review identified change in access to the Kaʻula Island TCP as a potential adverse effect. NHOs express a fundamental desire to visit the island to safely resume traditional practices at the TCP. They would achieve this by performing cultural protocols, confirming interpretations of archaeological sites from NHO viewpoints, observing heiau, collecting feathers, and conducting traditional practices as documented in mele (songs) and oli (chants). While NHOs may not have had physical access to the island in recent years (limiting or negating cultural practices), they maintain their cultural traditions associated with Kaʻula Island

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

and continue to value the island as a TCP. In accordance with 36 C.F.R. § 800.5(a)(2)(iv), adverse effects on historic properties may include a change of the character of the property's historic use or of physical features within the property's setting that contribute to its historic significance. Further limiting NHO access to the island will adversely affect the Kaʻula Island TCP.

In accordance with Section VI of the 2012 PA, the Navy is now seeking concurrence from SHPO on this determination of the APE for Section 106 purposes. Further, the Navy requests SHPO promptly provide any advice or comment that it has regarding the findings of effect as detailed above. We plan to initiate consultation to resolve the adverse effects in accordance with Stipulation IX.C.1 of the 2012 PA and 36 C.F.R. § 800.6. The Navy respectfully requests SHPO's reply within 30 days of receipt. The Navy is also sending this letter to NHOs for comments on the finding of effect. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311
Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311
Date: 2025.06.04 15:47:10 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Jessica Puff, State Historic Preservation Division
Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawaiʻi Environmental Director
Kamakana Ferreira, Office of Hawaiian Affairs Compliance Archaeologist
C. Kunane Aipoalani, Na ʻOhana Papa O Mānā
E. Kalani Flores, Flores-Case ʻOhana
Kawaikapuokalani Hewett, Loea, Kumu Hula, Direct Descendant of Kūhaimoana
Kekuewa Kikiloi, Nohopapa Hawaiʻi
Peleke Flores, Kiaʻi Kanaloa
Pelika Andrade, Nā Maka Onaona
Richard Keaoopuaokalani NeSmith, Researcher and Consultant
Robinson Family, Niʻihau
Kane Alii Williams, ʻOhana of Papapa of Niʻihau, Direct Descendant of Kūhaimoana
Walter Ritte, ʻĀina Momona

Reference 1: Programmatic Agreement among Commander, Navy Region Hawaiʻi, the Advisory Council on Historic Preservation and the Hawaiʻi State Historic Preservation Officer regarding Navy Undertakings in Hawaiʻi. 2012, as amended in 2024.

Reference 2: Navy's determination of eligibility letter to SHPD, February 2025.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I

Reference 3: *Final Report Archaeological Survey of Ka'ula Island.* Prepared by Ogden Environmental and Energy Services Co., Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i. Robins and Anderson, 2001.

Reference 4: Niihau: The Traditions of an Hawaiian Island. Mutual Publishing, Honolulu. Tava and Keale, 1989.

5

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I

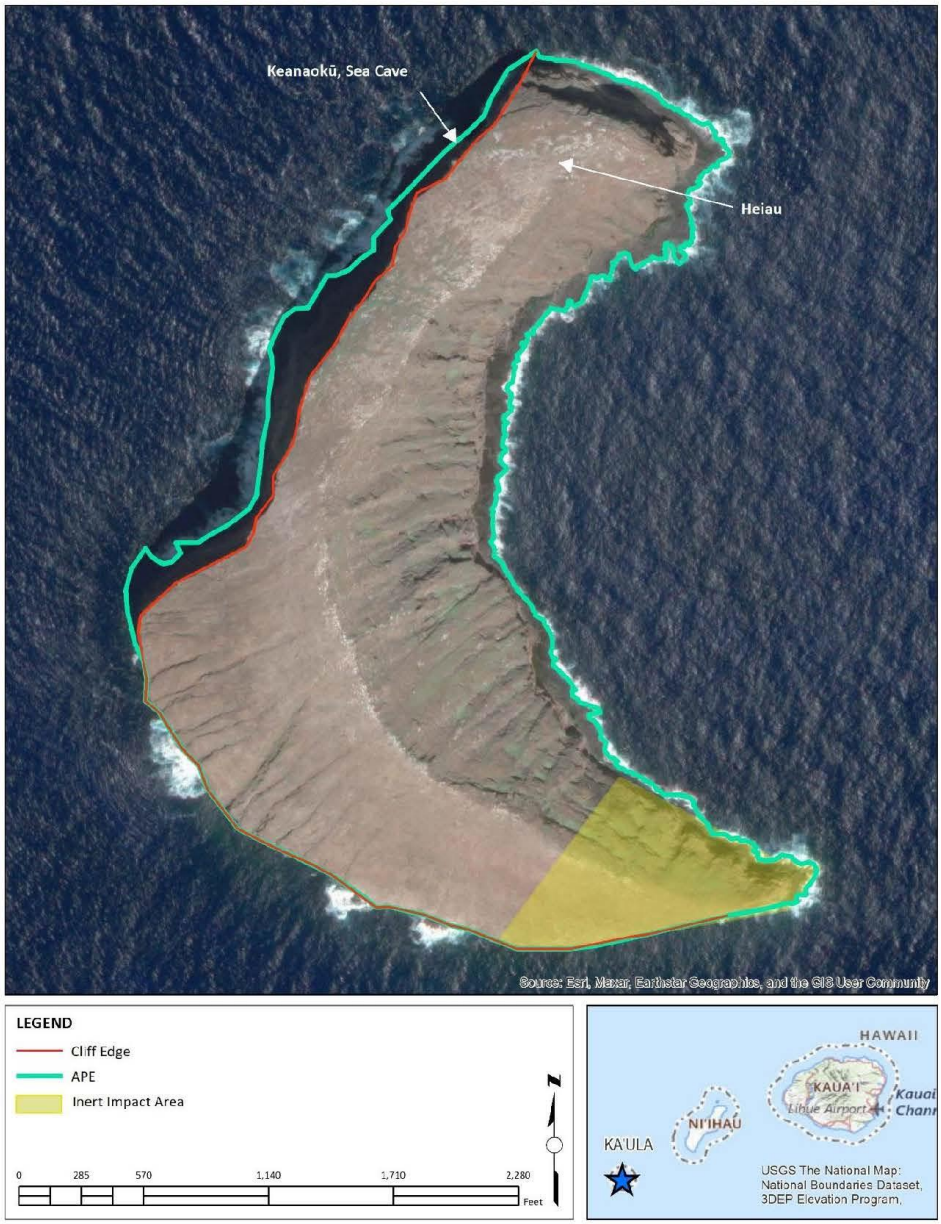


Figure 1: Map of Area of Potential Effect

6

C.5.2 Native Hawaiian Organizations

C.5.2.1 U.S. Department of the Navy to Aina Momona

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0661
14-Nov-24

Mr. Walter Ritte, Executive Director
Aina Momona
[redacted]

Dear Mr. Ritte:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. The Navy received your September 27, 2024 letter regarding the DEA in which you expressed interest in the Section 106 process. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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The Navy received additional comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Kaʻula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana the Shark God who lives in a large underwater cave known as Hālauaola. Historic accounts suggest Hawaiians visited the island for

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0661
14-Nov-24

Mr. Walter Ritte, Executive Director
Aina Momona
[redacted]

Dear Mr. Ritte:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

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Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

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During a recent meeting, State Historic Preservation Division (SHPD) staff requested information about existing surveys of Kaʻula Island and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties. Accordingly, the Navy intends to engage with SHPD staff on past surveys and potential additional survey methodologies.

The Navy is committed to working with NHOs to ensure full and comprehensive environmental review of this undertaking. At this time, the Navy is seeking additional information beyond what you have already provided regarding the identification of historic properties on Kaʻula Island to which your NHO attaches religious and cultural significance. The Navy would like to set up a meeting to discuss the identification efforts and other relevant issues at your earliest convenience.

The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara Del Fierro, at tara.m.delfierro.civ@us.navy.mil. Please contact her via email with your availability and Ms. Del Fierro will set up a meeting.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.14 15:54:02 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.2 U.S. Department of the Navy to Flores-Case ʻOhana

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0662
14-Nov-24

Mr. E. Kalani Flores, Representative of the Flores-Case ʻOhana
Flores-Case ʻOhana
[redacted]

Dear Mr. Flores:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. The Navy received your September 30, 2024 letter regarding the DEA in which you expressed interest in the Section 106 process. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

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The Navy is committed to working with NHOs to ensure full and comprehensive environmental review of this undertaking. At this time, the Navy is seeking additional information beyond what you have already provided regarding the identification of historic properties on Kaʻula Island to which your NHO attaches religious and cultural significance. The Navy would like to set up a meeting to discuss the identification efforts and other relevant issues at your earliest convenience.

The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara Del Fierro, at tara.m.delfierro.civ@us.navy.mil. Please contact her via email with your availability and Ms. Del Fierro will set up a meeting.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.14 15:53:20 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.3 U.S. Department of the Navy to Dr. Kikiloi

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0721
22-Nov-24

Dr. Kekuewa Kikiloi
[redacted]

Dear Dr. Kikiloi:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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The Navy received comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Kaʻula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana the Shark God who lives in a large underwater cave known as Hālauaola. Historic accounts suggest Hawaiians visited the island for collection of natural resources, including stone used in traditional octopus lures. In response to comments received regarding historic properties on Kaʻula, and in accordance with the 2012 PA, the Navy intends to

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

engage with Native Hawaiian Organizations, the Office of Hawaiian Affairs, and State Historic Preservation Officer to gather additional information about Ka'ula Island.

During a recent meeting, State Historic Preservation Division (SHPD) staff requested additional information about existing surveys of Ka'ula Island and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties. Accordingly, the Navy intends to engage with SHPD staff on past surveys and potential additional survey methodologies. Dr. Susan Lebo indicated you might be interested in sharing information about Ka'ula Island.

The Navy is committed to working with NHOs to ensure full and comprehensive environmental review of this undertaking. At this time, the Navy is seeking additional information regarding the identification of historic properties on Ka'ula Island to which your NHO may attach religious and cultural significance. If you are interested, the Navy would like to set up a meeting to discuss the identification efforts and other relevant issues at your earliest convenience.

The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil. Please contact her via email with your availability and Ms. Del del Fierro will set up a meeting.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:06:54 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.4 U.S. Department of the Navy to Na Maka Onaona

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0722
22-Nov-24

Ms. Pelika Andrade
Na Maka Onaona
[redacted]

Dear Ms. Pelika Andrade:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

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Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:06:19 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.5 U.S. Department of the Navy to No Ohana Papa O Mana

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0723
22-Nov-24

Mr. C. Kunane Aipoalani
Na Ohana Papa O Mana
[redacted]

Dear Mr. Kunane Aipoalani:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

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Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:05:59 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.6 U.S. Department of the Navy to Dr. Richard Keaoopuaokalani NeSmith

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0724
22-Nov-24

Dr. Richard Keaoopuaokalani NeSmith
Kaunalewa
[redacted]

Dear Dr. Richard Keaoopuaokalani NeSmith:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

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Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:05:40 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

2

C.5.2.7 U.S. Department of the Navy to Kanaka, Kia'i Kanaloa

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0725
22-Nov-24

Mr. F. R. Peleke Flores
Kanaka, Kia'i Kanaloa
[redacted]

Dear Mr. F. R. Peleke Flores:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act. As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

To recap, the proposed undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties are avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapua'a Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Ka'ula Island.

The Navy received comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Ka'ula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana the Shark God who lives in a large underwater cave known as Hālauaola. Historic accounts suggest Hawaiians visited the island for collection of natural resources, including stone used in traditional octopus lures. In response to comments received regarding historic properties on Ka'ula, and in accordance with the 2012 PA, the Navy intends to

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

engage with Native Hawaiian Organizations, the Office of Hawaiian Affairs, and State Historic Preservation Officer to gather additional information about Ka'ula Island.

During a recent meeting, State Historic Preservation Division (SHPD) staff requested additional information about existing surveys of Ka'ula Island and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties. Accordingly, the Navy intends to engage with SHPD staff on past surveys and potential additional survey methodologies.

The Navy is committed to working with NHOs to ensure full and comprehensive environmental review of this undertaking. At this time, the Navy is seeking additional information regarding the identification of historic properties on Ka'ula Island to which your NHO may attach religious and cultural significance. If you are interested, the Navy would like to set up a meeting to discuss the identification efforts and other relevant issues at your earliest convenience.

The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil. Please contact her via email with your availability and Ms. Del del Fierro will set up a meeting.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:05:09 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

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C.5.3 Office of Hawaiian Affairs

C.5.3.1 U.S. Department of the Navy to Office of Hawaiian Affairs

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0720
22-Nov-24

Ms. Stacy Ferreira
Office of Hawaiian Affairs

Dear Ms. Ferreira:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

The Navy recently requested comments from the public on the National Environmental Policy Act (NEPA) Draft Environmental Assessment (DEA) for Land-based Training and Testing at the Pacific Missile Range Facility (PMRF) and under Section 106 of the National Historic Preservation Act (NHPA). The Navy received Office of Hawaiian Affairs' (OHA) letter dated September 30, 2024 regarding the DEA and the Navy's approach to meeting responsibilities pursuant to Section 106 of the NHPA. The Navy is writing to address OHA's comments related to NHPA. Comments regarding certain aspects of the DEA are beyond the scope of this Section 106 NHPA discussion and will be addressed separately through the NEPA process.

As explained in the DEA, the proposed action/undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities or new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties are avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapua'a Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Ka'ula Island.

As noted in the DEA, the Navy's intent is to meet responsibilities pursuant to Section 106 of NHPA for the subject undertaking is in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1).

OHA's letter requested clarification on the way information regarding the 2012 Programmatic Agreement was presented in the DEA and requested a summary of mitigations as they relate to specific training activities. OHA also requested information about activities or training under the proposed action that may not be covered by the 2012 PA.

The 2012 PA is not limited to certain activities. Rather, the 2012 PA serves as a Section 106 program alternative for all Navy undertakings in Hawaii and provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties. In accordance with the PA, the Navy reviews planned training exercises, in advance, and ensures they occur within designated training areas and follow procedures established to avoid effects to historic properties.

OHA also requested information regarding mitigation as they pertain to testing and training activities. The established procedures for training and testing on PMRF, emphasize avoidance of historic properties. Protection measures include: 1) all personnel and users of the training ranges receiving environmental awareness training that includes cultural resources; 2) vehicles are restricted to established roads, no off-roading or driving on beaches without Navy approvals; 3) amphibious vehicles are required to drive on matting to protect ground surface; and 4) after-action inspections and field checks after amphibious operations and other operations are performed by the cultural resources staff to ensure avoidance of historic properties. On Kaʻula Island, training and testing activities are limited to the inert (non-explosive) target area on the southern tip of the island (Figure 1).

OHA also suggested the addition of maps to allow the public to understand where historic properties are located in relation to training areas. Under Section 304 of the NHPA, the Navy is obligated to protect certain sensitive information about historic properties from disclosure to the public, such as archaeological site locations.

Finally, OHA's letter expressed concern about Kaʻula Island noting that it is considered a true ancestor of the kānaka 'ōiwi, Native Hawaiian people. The Navy received similar comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public about continued use of Kaʻula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana, the Shark God who lives in a large underwater cave known as Hālauaola. Historic accounts suggest Hawaiians visited the island for collection of natural resources, including stone used in traditional octopus lures. In response to comments received regarding historic properties on Kaʻula, and in accordance with the 2012 PA, the Navy intends to engage with NHOs, OHA, and State Historic Preservation Officer (SHPO) to gather additional information about Kaʻula Island.

During a recent meeting, State Historic Preservation Division (SHPD) staff requested information about existing surveys of Kaʻula Island and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties.

Accordingly, the Navy intends to engage with SHPD staff to share information on past surveys and discuss potential additional survey methodologies.

The Navy is committed to working with OHA and NHOs to ensure a full and comprehensive review of this undertaking. At this time, the Navy is seeking additional information beyond what you have already provided regarding the identification of historic properties on Ka'ula Island to which NHOs may attach religious and cultural significance. The Navy is planning to meet with NHOs to discuss the identification efforts as well as concerns or questions about the training and testing activities that occur there. If OHA is interested in meeting with the Navy regarding these efforts and the implementation of the 2012 PA, please ask Mr. Ferreira to contact the PMRF Cultural Resources Manager, Ms. Tara Del Fierro, at tara.m.delfierro.civ@us.navy.mil to provide her with your availability and she will set up a meeting.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.25 15:06:36 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Enclosures:
(1) 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended (2012 PA)

cc: Mr. Kamakana Ferreira
Office of Hawaiian Affairs
kamakanaf@oha.org

3

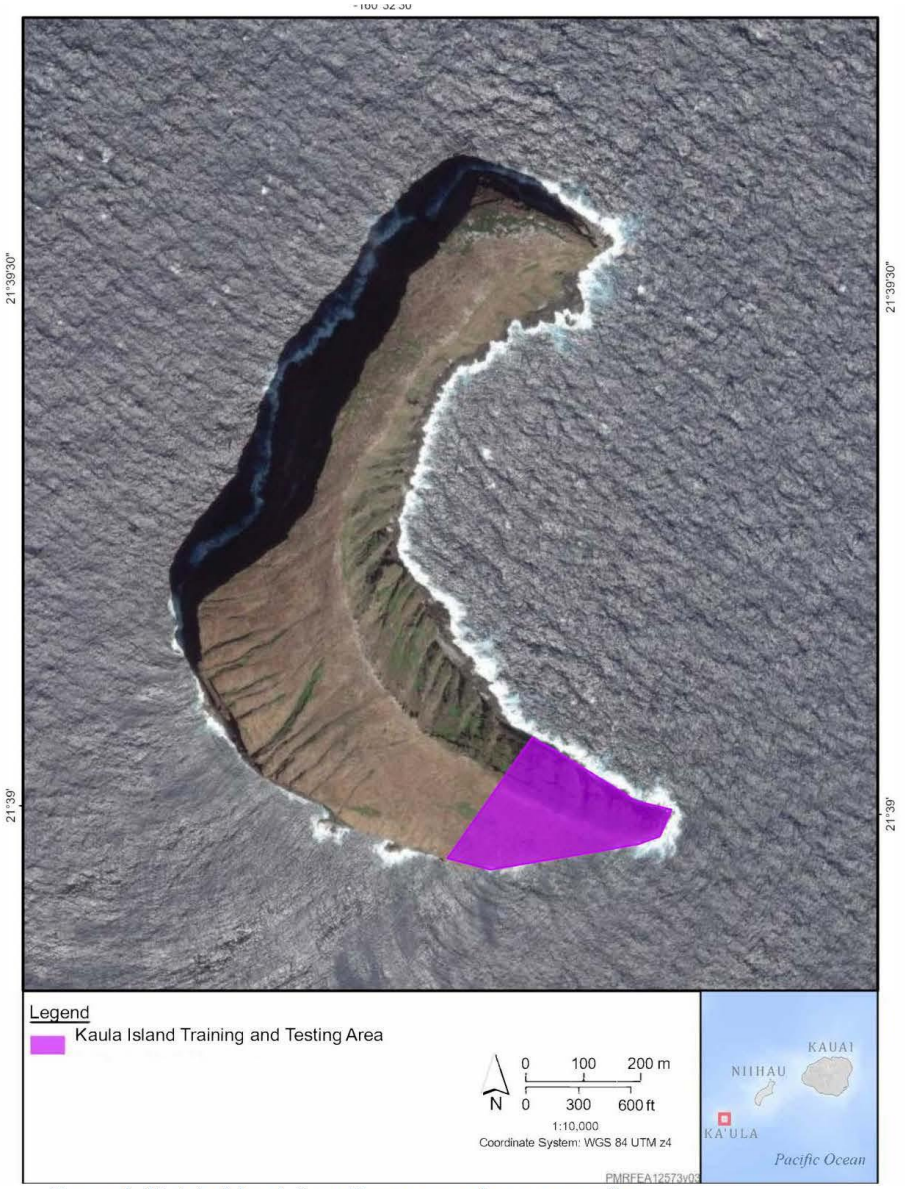


Figure 1: Ka'ula Island. Inert Target area shown in purple.

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C.5.4 Advisory Council of Historic Preservation

Advisory Council on Historic Preservation
Electronic Section 106 Documentation Submittal System (e106) Form
***MS Word* format**

Send to: *e106@achp.gov*

Please review the instructions at www.achp.gov/e106-email-form prior to completing this form. Questions about whether to use the e106 form should be directed to the assigned ACHP staff member in the Office of Federal Agency Programs.

I. Basic information

1. **Purpose of notification.** Indicate whether this documentation is to:
   - ☒ Notify the ACHP of a finding that an undertaking may adversely affect historic properties
   - ☒ Invite the ACHP to participate in a Section 106 consultation
   - ☐ Propose to develop a project Programmatic Agreement (project PA) for complex or multiple undertakings in accordance with 36 C.F.R. 800.14(b)(3)
   - ☐ Supply additional documentation for a case already entered into the ACHP record system
   - ☐ File an executed MOA or PA with the ACHP in accordance with 800.6(b)(iv) (where the ACHP did not participate in consultation)
   - ☐ Other, please describe
     Click here to enter text.

2. **ACHP Project Number** (If the ACHP was previously notified of the undertaking and an ACHP Project Number has been provided, enter project number here and skip to Item 7 below): Click here to enter text.

3. **Name of federal agency** (If multiple agencies, list them all and indicate whether one is the lead agency):

Department of the Navy (lead agency), Missile Defense Agency, United States Army, United States Air Force, United States Marine Corps.

4. **Name of undertaking/project** (Include project/permit/application number if applicable):

Pacific Missile Range Facility Land-based Training and Testing

5. **Location of undertaking** (Indicate city(s), county(s), state(s), land ownership, and whether it would occur on or affect historic properties located on tribal lands):

Pacific Missile Range Facility (PMRF), Kaua'i and Ka'ula Island, Kaua'i County, Hawai'i, federally-owned. Project will affect historic property on federal land.

ADVISORY COUNCIL ON HISTORIC PRESERVATION
401 F Street NW, Suite 308 ▯ Washington, DC 20001-2637
Phone: 202-517-0200 ▯ Fax: 202-517-6381 ▯ achp@achp.gov ▯ www.achp.gov

6. Name and title of federal agency official and contact person for this undertaking, including email address and phone number:

Ms. Tara del Fierro, PMRF Cultural Resources Manager, tara.m.delfierro.civ@us.navy.mil, (808) 602 3708

Captain Robert A. Prince, Commanding Officer PMRF, robert.a.prince.mil@us.navy.mil, (315) 253-4011

II. Information on the Undertaking*

7. Describe the undertaking and nature of federal involvement (if multiple federal agencies are involved, specify involvement of each):

The Navy is meeting its responsibilities pursuant to Section 106 of the National Historic Preservation Act for the subject undertaking in accordance with the 2012 Programmatic Agreement Among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (hereinafter "2012 PA"), specifically Section IX.C(1). This notification per 36 C.F.R. § 800.6 (a)(1) is made to the Advisory Council on Historic Preservation regarding the determination of adverse effect finding and to invite the Council to participate if it so chooses. The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHOs) and consulting parties as the Navy proceeds further in this undertaking review.

The proposed undertaking is to continue to conduct land-based, multi-domain training and testing activities to support military training readiness at launch areas and other locations within the existing PMRF Barking Sands and Kaʻula Island footprints. The proposed undertaking includes increased training and testing activities conducted by the Navy, Army, Air Force, Marine Corps, and Missile Defense Agency. Training and testing activities would be conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training or testing activities and no new training areas are proposed. The proposed training program incorporates specific measures to ensure that known historic properties will be avoided and cultural resources are protected.

The land-based training and testing includes the following activities, either independently or in combination, and would take place only on land owned by the Navy: the terrestrial portion of missile, rocket, and aerial target drone launches and launch set-up; the terrestrial portion of artillery live fire; insertion and extraction of swimmers; amphibious small boat operations; amphibious raid operations; Forward Arming and Refueling Point operations; Small Unmanned Aircraft Systems (UAS) and Counter-UAS Operations; parachute operations; Command, Control, Computing, Communications, Cyber, Intelligence, Surveillance, Reconnaissance and Targeting exercises, to include command post exercises and communication relay exercises; the establishment and operation of expeditionary field lodging for personnel conducting training (bivouacking); and helicopter/tilt-rotor landing zone operations from the airport surface. Air-to-Ground Gunnery Exercise using only inert munitions and Air-to-Ground Bombing Exercise using only inert munitions on Kaʻula Island are also included in this undertaking.

Activities would be limited to the existing training and testing areas at PMRF, including North and South Launch Areas, Palai Olani, Waiapuaʻa Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, and Kaʻula Island (Attachment 1). The Kauai Test Facility and routine airfield operations at PMRF are not part of this undertaking, nor are activities at Makaha Ridge, Port Allen, Kokee, and Niʻihau Island.

8. Describe the Area of Potential Effects (APE):

The Navy reviewed proposed training activities for the undertaking under Section IX of the 2012 PA. Consistent with Stipulation IX.A(1), Navy personnel determined that proposed activities on Barking Sands at PMRF do not have the potential to cause effects on listed, contributing, or eligible historic properties. Therefore, no further review under the 2012 PA and the NHPA is required and none of the proposed training areas within the PMRF Barking Sands footprint were included in the APE.

The Navy reached a different effects determination regarding Ka'ula Island. Ka'ula Island is a crescent-shaped islet approximately 22 miles southwest of Ni'ihau. The 113-acre-island is about 1.5 km long and 0.1-0.3 km wide, and the highest point on the island is near the center. Training activities are limited to the 10-acre inert impact area located on the southern end of the island. In consultation with the Hawaii State Historic Preservation Officer (SHPO) and Native Hawaiian stakeholders, the Navy determined the island is a Traditional Cultural Place (TCP) eligible for listing in the NRHP due to its association with significant cultural traditions and events in Hawaiian history. Therefore, the Navy proposed that the entire island comprise the APE for the purposes of this consultation (Attachment 2). In compliance with Stipulation VI of the 2012 PA, the Navy consulted with SHPO to determine the APE. More than 30 days have elapsed and recent communication with SHPO suggests concurrence with the Navy's determination.

9. Describe steps taken to identify historic properties:

Previous professional identification and evaluation studies at PMRF Barking Sands include (1) reconnaissance and surface surveys to identify archaeological sites, (2) subsurface testing and excavation at archaeological sites, (3) ground-penetrating radar surveys to identify subsurface anomalies possibly indicative of cultural deposits, (4) archaeological monitoring projects, and (5) historic research and cultural studies to identify traditional cultural places. Most of the archaeological investigations at Barking Sands have involved surface surveys. Coverage includes nearly all the Barking Sands footprint. Though five historic properties have been identified at Barking Sands, as noted, this area is outside of the APE.

A limited number of archaeological studies have taken place on Ka'ula Island due to its remote location and difficulty to access by air. The island has steep sea cliffs on its sides and the rough seas and rocky shorelines make it hard to reach by boat as well. Dr. Robert Hommon of the State Parks Historic Sites Division of the DLNR conducted the earliest survey of Ka'ula Island in 1976. Dr. Hommon identified four sites on the island, including a cave, low mounds, a terraced platform, and a lighthouse foundation. Two sites were located on the northern end of the island and two sites were near or on the summit (at center of island).

The Navy conducted a pedestrian survey of accessible areas of the island in 1999. This survey identified six archaeological sites, five located on the northern end of the island and one on the summit. Please see a summary of the sites and the associated findings in Table 1 below. The Navy observed three of the sites identified by Dr. Hommon. The cave site recorded by Hommon was not found, and the portion of the cliff where the cave was located showed evidence of collapse due to erosion. Neither survey (1976, 1999) identified archaeological sites at the southern end of the island.

Table 1: Summary of Archaeological Sites on Ka'ula Island

Site number	Site Feature(s)	Site Types	Probable Functions
50-70-99-01	Concrete foundation, historic materials	Historic era	Former U.S. Coast Guard lighthouse, 1932-1948

50-70-99-02	Terrace, stone rubble walls, modified cave, artifacts related to stone production, and branch coral	Hawaiian	Short-term habitation and/or used for ceremonial functions
50-70-99-03	Mound and two circular enclosures associated with short-term habitation; modern materials	Hawaiian; Historic era	Short-term habitation and/or used for ceremonial functions, and historic shelter
50-70-99-04	Two mounds and a rectangular-shape depression; modern materials	Hawaiian; Historic era	Possible remnant of Hawaiian structure, location appears to correlate with heiau on 1923 photograph
50-70-99-05	Mound	Unknown	Lacked sufficient integrity for an interpretation of function and cultural affiliation
50-70-99-06	Cave with traditional Hawaiian octopus lure sinker preform made from locally sources olivine nodule; modern materials	Hawaiian; Historic era	Utilized as a shelter and short-term habitation

In 2004, the Navy conducted a study to identify potential TCPs on Kaʻula Island. The study relied on historical accounts, traditional Hawaiian texts, historical maps, ethnographic reports, and interviews with Hawaiian community members. The study identified three places as potential TCPs: (1) Kaʻula Island, (2) Keanaokū (also called Kūhaimoana), a cave recognized as home to a shark god, and (3) Kahālauloa, a heiau (sacred Hawaiian temple). Recent engagement with NHOs corroborates many of the findings in the 2004 TCP report.

10. Describe the historic property (or properties) and any National Historic Landmarks within the APE (or attach documentation or provide specific link to this information):

Based on information provided by NHOs as well as archival, historical, and ethnographic research, the Navy determined that Kaʻula Island is a site traditionally recognized as significant to Native Hawaiians because of its association with cultural beliefs, practices, and values. Native Hawaiian views related to Kaʻula Island are widely shared within the community and have been passed down through generations, thus serving an important role in maintaining the group's cultural identity. While the Navy recognizes changes have taken place from historic activities, including lighthouse construction and military training activities, Kaʻula Island retains its integrity of location, setting, feeling, and association. The applicable National Register area of significance is Ethnic Heritage-Pacific Islander, Native Hawaiian. Kaʻula Island is historically important at the state level of significance with a period of significance from circa 1870 to present.

The Navy determined that Kaʻula Island meets the essential characteristics of a TCP eligible for inclusion in the National Register. The Navy made this assessment based on an understanding of the significance of Kaʻula Island as well as the physical and nonphysical aspects that characterize and convey the perspective of the Native Hawaiian community. Notably, the island itself possesses historical and cultural significance. Below is a list of character-defining features of Kaʻula Island with supporting information.

1. The island itself is associated with significant cultural traditions and events in Hawaiian history:

• Kaʻula Island is a natural feature connected to the direction west, sunset, the deities Pele, Kūhaimoana,

Kāne, and Kanaloa, aliʻi (chief, royalty), navigation, the wind, astronomy, transition, creation, and symbolic associations of life and death. Kaʻula is also part of Hawaiian astronomical architecture, and together with Niʻihau forms a winter solstice sightline from Kaunalewa Ridge on Kauaʻi.

• The importance of Kaʻula Island as wahi pana (sacred place) is conveyed in creation stories, cosmology, and Native Hawaiian traditions of oli (chants) and mele (songs). For NHOs, Kaʻula Island's physical location makes it one of the older islands in the Hawaiian chain. Understood as a child of Papahānaumoku and Wākea, its origin, age, and genealogical ties to Native Hawaiians are a source of reverence.

• Native Hawaiians identify the island as essential to past traditional practice of collecting birds and feathers in addition to current practice of fishing in the waters surrounding Kaʻula Island and Niʻihau. NHOs note koaʻeʻula, or red-tailed tropicbirds, are specifically associated with Kaʻula and they identified birds of Kaʻula as a potential food supply and source for production of chiefly items, like ahuʻula (feather cape) or kāhili (feather standard).

2. Keanaokū, sea cave:

• Home to the shark deity Kūhaimoana and an important place to perform cultural protocols.

3. Heiau (Kahālauloa, Kaneneʻeneʻe, Pahoku-pio, and Ka-unu):

• Connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific.

• Likely the place Ka-hālau-a-Ola in songs and chants and associated with concept of revitalized life.

• Ethnographically associated with paying tribute to Kūhaimoana.

11. Describe the undertaking's effects on historic properties:

Proposed training on Kaʻula Island would occur within the existing 10-acre inert impact area on the southern end of the island. The Navy's review of potential effects to the sea cave and heiau found that adverse effects would be avoided because these features are on the island's northern side, well outside the area where proposed training activities would take place. Since the proposed undertaking includes no new areas or new types of training activities, no direct or indirect effects are expected to impact the northern side of the island where the sea cave and heiau exist. Thus, the proposed undertaking will not alter these character-defining features, allowing them to retain their integrity of location, setting, feeling, and association.

The review of potential effects also focused on the island itself. Specifically, the impacts to natural or physical features of the island and its associated cultural traditions were key interests raised by the consulting parties that warranted investigation. To assess the potential for physical damage to Kaʻula Island, the Navy reviewed reports and high-resolution aerial photography of the island with a detailed inspection of the inert impact area. Photographs show remnants of inert munitions largely resting on the ground surface with a small number embedded into the ground because an inert round fired does not have the same percussive impact of an explosive round. Cratering or significant physical disturbances to the ground surface from the impacts are not detectable in the aerial views. The analysis suggests that use of inert ordnance results in minimal physical damage to the island, thus having no adverse effects on this aspect of Kaʻula Island's integrity.

Another potential effect includes the introduction of visual, atmospheric, or audible elements that could diminish the integrity of the historic property. Although audible elements are expected to occur during proposed training, these sounds would be brief and temporary and would not rise to the level of adverse effect. Visual and atmospheric elements introduced during proposed training on Kaʻula Island include debris from inert munitions.

12. Explain how this undertaking would adversely affect historic properties (include information on any conditions or future actions known to date to avoid, minimize, or mitigate adverse effects):

As noted, the proposed training activities are limited to the existing 10-acre inert impact area on the southern end of the island and only inert munitions would be used in training. These conditions on proposed activities are in effect to avoid and mitigate effects to the Ka'ula Island TCP.

Cleanup of inert munitions (casings) is not part of proposed activities and is not possible at this time. Therefore, the accumulation of inert munitions debris affects aspects of integrity such as the setting and feeling of the island. Setting is the physical environment of the TCP and refers to the character of the place in which the property played its historical role. Ka'ula Island is regarded by participating NHOs as wahi pana, a sacred place celebrated and storied in the cultural traditions of Hawai'i. The island is noted for its sacred and remote landscape as well as natural resources traditionally utilized by Native Hawaiians such as birds, their eggs and feathers, and olivine stones used to make fishing lures. The expended munitions remaining on the island are not congruent with the basic physical conditions understood historically as a revered landscape. Feeling is a nonphysical aspect of integrity that is a place's expression of the aesthetic or historic sense of a particular period. Participating NHOs regard Ka'ula Island as a family member, and the presence of physical and natural features, collectively, reflect Native Hawaiians' spiritual values and genealogical ties. Our review of potential effects, along with consideration of NHO perspectives, indicates that the proposed increase in activities will introduce additional visual and atmospheric elements that diminish the integrity of setting and feeling and will adversely affect the Ka'ula Island TCP.

In addition, the Navy's review identified access limitations to the Ka'ula Island TCP as a potential adverse effect. NHOs express a fundamental desire to visit the island to safely resume traditional practices at the TCP. They would achieve this by performing cultural protocols, confirming interpretations of archaeological sites from NHO viewpoints, observing heiau, collecting feathers, and conducting traditional practices as documented in mele and oli. While NHOs may not have had physical access to the island in recent years (limiting or negating cultural practices), they maintain their cultural traditions associated with Ka'ula Island and continue to value the island as a TCP.

13. Provide copies or summaries of the views provided to date by any consulting parties, Indian tribes or Native Hawai'ian organizations, or the public, including any correspondence from the SHPO and/or THPO.

Native Hawaiians expressed a range of cultural, environmental, and spiritual concerns regarding effects of military training activities on Ka'ula Island. These concerns, articulated during a series of consultation meetings, are grounded in deep ancestral, cultural, and spiritual connections to the island. Note that some of these concerns do not pertain to the National Historic Preservation Act Section 106 process; however, they are included in an effort to present the most prevalent input from NHOs.

Table 1: Summary of Views provided by Native Hawaiian Organizations

Cultural Connections and Spiritual Significance	Ka'ula Island is regarded as sacred by many Native Hawaiians. NHOs highlighted the importance of Ka'ula as a wahi pana and stressed that it should be honored and cared for as kupuna (ancestral/familial relationship).
	One NHO provided historical evidence of their genealogical relationship to the island and Kūhaimoana (shark akua [god] or 'aumākua [deified ancestor].
	Military training exercises are seen as desecrating a sacred site, violating traditional beliefs and cultural practices that emphasize respect for and stewardship of the land. For some NHOs, the training exercises create emotional and spiritual harm.

	The importance of the island is conveyed in traditional Hawaiian forms such as mele, mo'olelo (narrative stories), and oli with connections to the direction west, sunset, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, ali'i, navigation, the wind, astronomy, transition, creation, and symbolic associations of life and death.
Environmental and Ecological Damage	Ka'ula is home to native seabird populations and marine life. NHOs are concerned that military exercises can potentially lead to habitat destruction, pollution, and disruption of wildlife.
	The presence of unexploded bombs poses long-term risks to both the environment and safety of Native Hawaiians who want to visit the site.
	Remnants of inert munitions create environmental hazards not compatible with the island's ecological and physical conditions.
Access Restrictions	Native Hawaiians are denied access to the island for traditional cultural practices such as spiritual observances, religious practices, and navigation training because of military use and safety concerns.
	NHOs emphasized that Ka'ula Island needs to be accessible to Kānaka Maoli (Native Hawaiians) to satisfy educational needs and substantiate historical accounts.
	Access would allow NHOs to verify traditional knowledge as transmitted in oral traditions and to observe and verify existence and condition of the sea cave and heiau.
	Some NHOs requested on-land access, while others expressed a desire to visit the island by ship only to avoid contamination or introduction of invasive species.
	NHOs conveyed a sense of neglect and loneliness based on their inability to visit the site.
Sovereignty and Self-Determination	There is concern that continued military control over Hawaiian lands, including Ka'ula Island, perpetuates historical injustices stemming from the illegal overthrow of the Hawaiian Kingdom.

III. Additional Information

14. **Please indicate the status of any consultation that has occurred to date, including whether there are any unresolved concerns or issues the ACHP should know about in deciding whether to participate in consultation.** Providing a list of consulting parties, including email addresses and phone numbers if known, can facilitate the ACHP's review response.

Consultation with the Hawaii SHPO and Native Hawaiian Organizations is currently ongoing.

Table 3: Native Hawaiian Contacts and Organizations

Contacts	Organization/Association
C. Kunane Aipoalani	Na 'Ohana Papa O Mānā
E. Kalani Flores	Flores-Case 'Ohana
Kamakana Ferreira	Office of Hawaiian Affairs
Kawaikapuokalani Hewett	Loea, Kumu Hula
Kekuewa Kikiloi	Nohopapa Hawai'i
Peleke Flores	Kia'i Kanaloa
Pelika Andrade	Nā Maka Onaona
Richard Keaoopuaokalani NeSmith	Researcher and Consultant
Robinson family	Ni'ihau
Terrill James Kane Alii Williams	'Ohana of Papapa of Ni'ihau
Walter Ritte	'Āina Momona

15 Does your agency have a website or website link where the interested public can find out about this project and/or provide comments? Please provide relevant links:

https://pacific.navfac.navy.mil/Portals/72/NAVFAC_PACIFIC/Documents/NEPA%20Info/2024/PMRFLBTEAFactSheetFINALAPPROVED20240908WEB.pdf
https://pmrfkauai.com/Environmental-Reviews

16. Is this undertaking considered a "major" or "covered" project listed on the Federal Infrastructure Projects Permitting Dashboard? If so, please provide the link:

No

The following are attached to this form (check all that apply):

☒ Section 106 consultation correspondence

☒ Maps, photographs, drawings, and/or plans

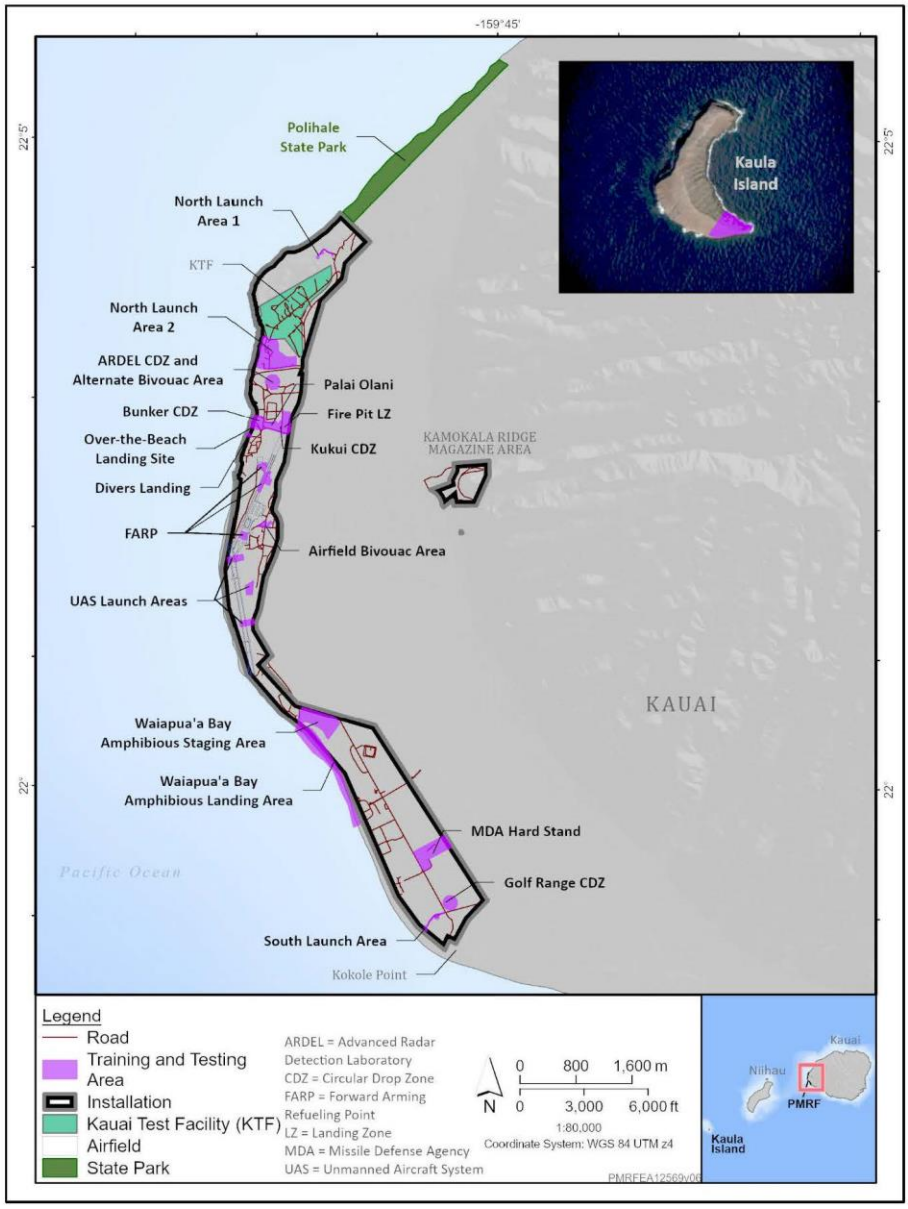
☐ Additional historic property information

☐ Consulting party list with known contact information

☒ Other: Avoidance and Protection Measures for Implementation of 2012 PA

9

Attachment 1: Existing Training and Testing Areas at PMRF



10

Attachment 2: Area of Potential Effect



11

Attachment 3: Navy Section 106 Consultation Correspondences to Hawaii SHPO

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0559
September 4, 2024

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

Dear Ms. Chang:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Pacific Missile Range Facility wishes to notify SHPO of the Navy's intent to meet responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). The 2012 PA provides an established framework for professional standards, reviews, post-review discoveries, emergencies, and reporting as well as a process for input from Native Hawaiian organizations (NHO) and consulting parties.

Consistent with 36 CFR § 800.2(a)(2), the Navy is designated as lead Federal agency for this undertaking on behalf of the following agencies: the Missile Defense Agency (MDA), United States Army, United States Air Force, United State Marine Corps. The proposed undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties will be avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapua'a Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Kaula Island (Figure 1). The Kauai Test Facility and routine airfield operations at PMRF are not part of this undertaking, nor are activities at Makaha Ridge, Port Allen, Kokee, and Niihau Island.

Implementation of the 2012 PA

In accordance with Stipulation IX., a qualified Navy cultural resources professional will conduct and/or oversee the training to ensure the following measures are incorporated:

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

a. Review each training evolution in advance to confirm that standard protective measures are appropriately incorporated into training and testing activities and are effective in protecting historic properties from adverse effects.

b. Initiate consultation with SHPO and NHO if the Navy determines that historic properties may be affected (Stipulation IX.C).

c. Provide SHPO with quarterly reports of activities reviewed under the 2012 PA, in addition to the annual report (Stipulation XII).

Pre-training and testing protective measures performed by qualified Navy professional include:

Conduct briefings to operational personnel for cultural resource sensitivities prior to training exercises. Ensure range users are informed regarding the following:

a. Archaeologically sensitive areas, importance of avoidance, and how to recognize cultural resources.

b. Discovery or inadvertent damage of cultural resources within training areas must be reported immediately.

c. ARPA Compliance: removal of historical, cultural, or archeological objects is prohibited and punishable by law.

d. Contact information for the Navy CRM.

Requirement that should unanticipated cultural resources be encountered; all activities will cease in the immediate vicinity of the find and reported to the Navy CRM.

a. Inadvertent discovery of Archaeological Remains.

b. Inadvertent discovery of Human Remains.

(1) Consultation with NHOs is required if Native Hawaiian remains are encountered or suspected.

(2) No photography or movement of osteological materials, secure area, and call Navy CRM.

Fire suppression communication.

a. Navy CRM communicates with range personnel regarding emergency management procedures.

2

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Monitoring during construction and/or ground-disturbing activities.

a. Navy CRM carries out field checks prior to amphibious operations and other operations to ensure avoidance of historic properties.

Range Users are required to stay on designated pathways without deviation.

Vehicles are restricted to established roads. No off-roading or driving on beaches without Navy approvals.

Navy CRM supports pre-exercise pedestrian survey relative to the proposed action.

Range users lay down rubber mats during amphibious operations. Rubber mats are used in the area where small boats come ashore to prevent disturbance to resources in the sand. During small boat operations, a four-wheel drive pickup truck and trailer are used to transport the small boats (Combat Rubber Raiding Craft) briefly across the rubber mats to hardened landing area access road.

Post-training and testing protective measures performed by the qualified Navy professional include:

Attend after action de-briefing for training activities and unanticipated incidents.

Post-exercise survey of area, triggered by unexpected fires or mishap.

Field checks after amphibious operations and other operations to ensure avoidance of historic properties.

Post-exercise pedestrian survey relative to the proposed action.

Reporting on unanticipated finds discovered during training activities.

The Navy is also notifying Native Hawaiian Organizations that have previously indicated to the Navy that PMRF holds religious or cultural significance regarding the proposed undertaking, and the planned implementation of the 2012 PA.

If SHPO has concerns or objections, the Navy respectfully requests a reply within 30 days of receipt. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.09.04 15:47:15 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

3

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Copy to: Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawaii Environmental Director

Enclosure 1: Programmatic Agreement among Commander, Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaii State Historic Preservation Officer regarding Navy Undertakings in Hawaii (2012 PA, Enclosure 1). 2012 PA

4

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

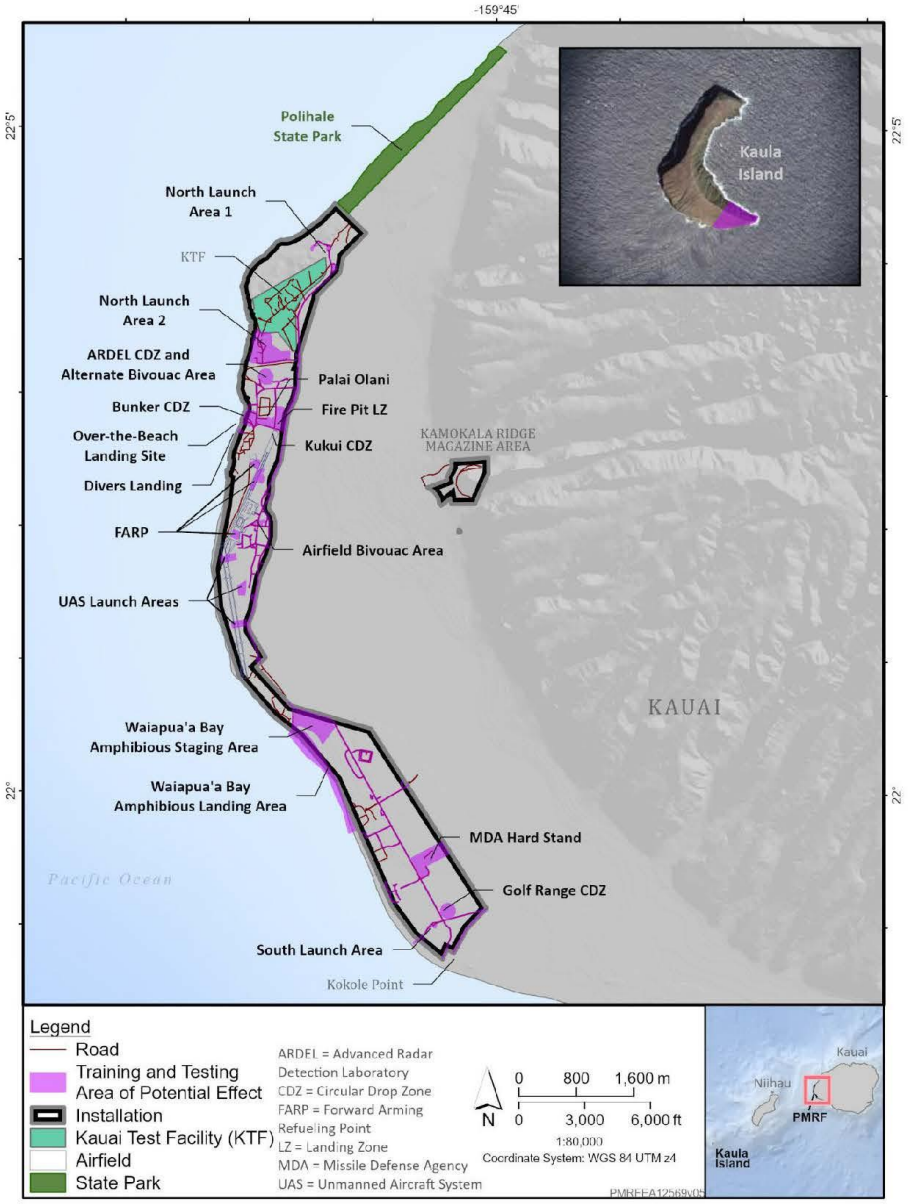


Figure 1: PMRF Land Based Training and Testing Areas

5

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0654
08-Nov-24

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

Dear Ms. Chang:

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAI, HAWAII

Consistent with Pacific Missile Range Facility ltr SER N4F/0559 of 4 September 2024 (HICRIS Project No. 2024PR01077) and the October 23, 2024 meeting between Navy and State Historic Preservation Division (SHPD) staff, this letter provides additional information about how the Navy will implement the 2012 PA in response to questions and concerns about the potential presence of Traditional Cultural Properties (TCPs) on Kaʻula Island. The Navy intends to share information from prior investigations and engage with Native Hawaiian stakeholders and SHPD to identify any additional historic properties, assess effects, and, if necessary, resolve any potential adverse effects as stipulated in the 2012 PA.

To recap, the proposed undertaking comprises training and testing activities conducted within established ranges consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. The training program incorporates specific measures to ensure that known historic properties will be avoided and cultural resources are protected. Activities would be limited to the existing training and testing areas of PMRF, including North and South Launch Areas, Palai Olani, Waiapuaʻa Bay, Missile Defense Agency Hard Stand, Airfield and Alternate Bivouac Areas, Forward Arming and Refueling Point Areas, Unmanned Aircraft System Launch Area, Ground Maneuver Area, and Kaʻula Island.

Specific to Kaʻula Island, the area utilized for training is the existing 10-acre inert impact area located on the southern end of the island (Figure 1). The training on Kaʻula Island is important to future military capability in maritime conflict where islands can serve as strategic and logistic hubs. The continued usage remains occasional. It serves as a contingency air to ground area for the Navy deploying units that may need to complete required training/qualifications in Hawaii. The proposed increased use of Kaʻula for training provides Air Force, Army, and Marine Corps the required expanded capability to train in a maritime environment; and this location offers local units an opportunity they have not had in the past.

The Navy recently requested comments from the public on a draft environmental assessment and under Section 106 of the National Historic Preservation Act regarding PMRF Land Based Training and Testing (LBTT). The Navy received comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Kaʻula Island by the military for training and testing activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kūhaimoana the Shark God who lives in a large underwater cave known as Hālauaola. According to *Final Report Archaeological Survey of Kaʻula Island, Hawai'i* (Prepared in 2001 by J. Robins and L. Anderson for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i), historic accounts suggest Hawaiians visited the island for collection of natural resources, including stone used in traditional octopus lures. *Final Report Kaʻula Island, Hawaiʻi: A Study of Potential Native Hawaiian Traditional Cultural Places* (prepared in 2004 by Tuggle, D. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawaiʻi) also identified cultural traditions and place names associated with Kaʻula Island. In response to comments received regarding historic properties on Kaʻula, the Navy intends to engage with Native Hawaiian Organizations, the Office of Hawaiian Affairs, and SHPO to gather additional information about Kaʻula Island, as outlined in Stipulation VII.C. of the 2012 Programmatic Agreement among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation and the Hawaiʻi State Historic Preservation Officer regarding Navy Undertakings in Hawaii, as amended.

During a recent meeting, SHPD staff requested additional information about existing surveys of the training area and suggested the Navy consider additional survey of the inert impact area to assess the potential presence of historic properties. Accordingly, the Navy intends to engage with SHPD staff on past surveys and potential additional survey methodologies.

If you have questions or comments regarding this additional information, the point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2024.11.12 14:13:05 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Dr. Susan Lebo, State Historic Preservation Division
Ms. Jessica Puff, State Historic Preservation Division

2

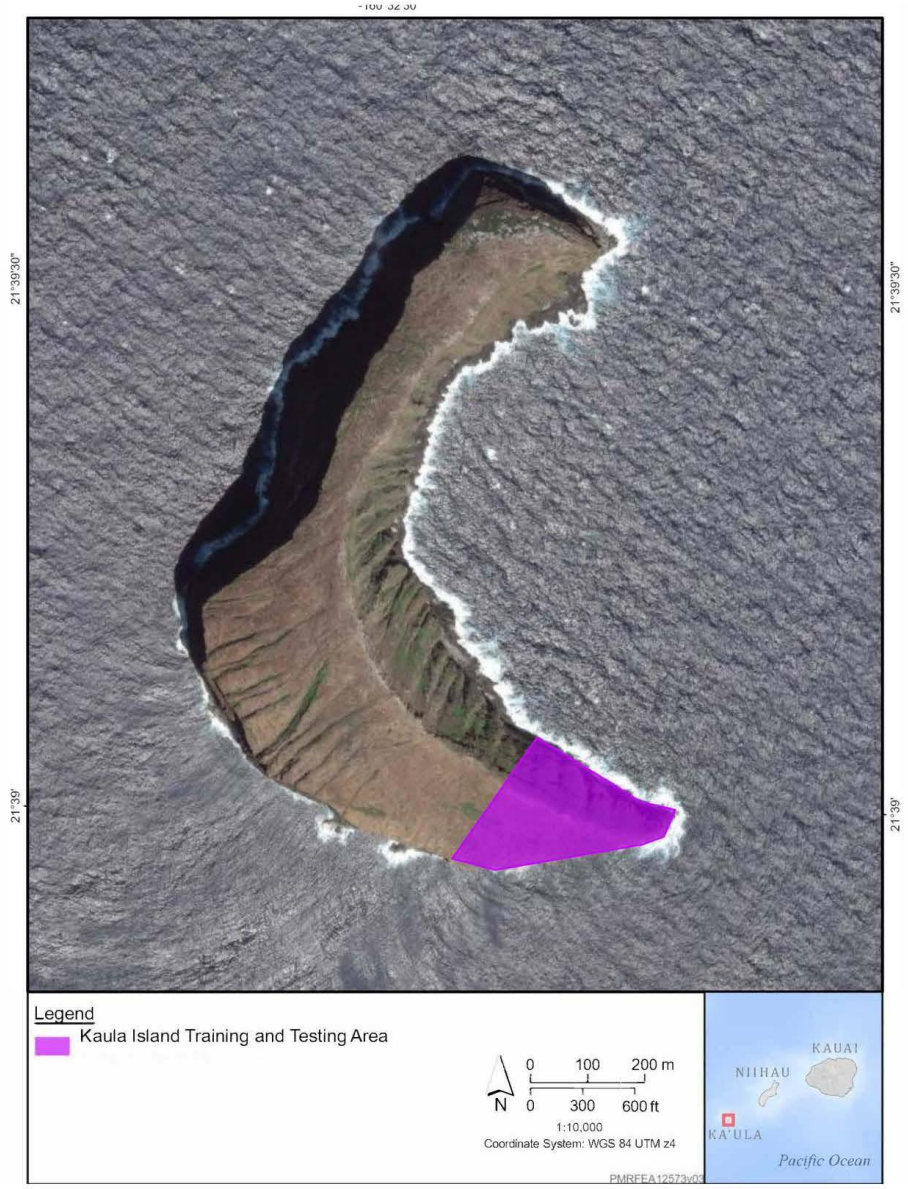


Figure 1: Ka'ula Island. Inert Target area shown in purple.

3

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0126
26-Feb-25

Ms. Dawn Chang
State Historic Preservation Officer
DLNR Main Office
Kalanimoku Building
1151 Punchbowl St.
Honolulu, HI 96813

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI (HICRIS Project No. 2024PR01077)

Dear Ms. Chang:

In furtherance of the Navy's efforts to evaluate historic properties on Kaʻula Island and as discussed in the November 08, 2024 letter (Enclosure 1), this letter updates you on the steps taken to gather additional information from Native Hawaiian Organizations (NHOs) and interested parties on the potential presence of Traditional Cultural Places (TCPs) on Kaʻula Island. Since November 2024, the Navy has conducted multiple meetings with interested parties, many of whom are NHOs. The Navy shared information about prior surveys of Kaʻula Island, conducted additional information gathering and research, and engaged with NHOs to gather input regarding traditional knowledge and cultural practices pertaining to Kaʻula Island.

Consistent with Stipulation VII.C of the 2012 PA (Reference 1), the Navy applied the National Register Criteria (36 C.F.R. § 60.4), and determined that Kaʻula Island meets the criteria of a Traditional Cultural Place eligible for listing under National Register Criterion A (Events) as an association with "events that have made a significant contribution to the broad patterns of [Native Hawaiian] history." Kaʻula Island is also eligible for inclusion in the National Register of Historic Places (NRHP) under Criteria B (Persons) for its association with the lives of significant persons (i.e., ancestors, mythical figures) and D (Information Potential) for its potential to provide information about Hawaiʻi's historical past.

IDENTIFICATION OF HISTORIC PROPERTIES

Kaʻula Island is on the earliest maps of Hawaiʻi and referenced in many traditional Hawaiian texts. The island is a crescent-shaped islet approximately 22 miles southwest of Niʻihau (Figure 1). The 113-acre island is about 1.5 km long and 100-300 m wide and the highest point on the island is near the center. The island has steep sea cliffs on its sides and the rough seas and rocky shorelines make it hard to reach by boat.

A limited number of archaeological studies have taken place on Kaʻula Island due to its remote location and difficulty to access by vessel or by air. The Navy submitted these studies to SHPD via HICRIS. Dr. Robert Hommon of the State Parks Historic Sites Division of the DLNR conducted the earliest survey of Kaʻula Island in 1976 (Reference 2). Dr. Hommon identified four sites on the island, including a cave, low mounds, a terraced platform, and a lighthouse

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

foundation. Two sites were located on the northern end of the island and two sites were near or on the summit (at center of island).

The Navy conducted a pedestrian survey of accessible areas of the island in 1999 (Reference 3). This survey identified six archaeological sites, five located on the northern end of the island and one on the summit. Please see a summary of the sites and the associated findings in Table 1 below. The Navy observed three of the sites identified by Dr. Hommon. The cave site recorded by Hommon was not found, and the portion of the cliff where the cave was located showed evidence of collapse due to erosion. Neither survey (1976, 1999) identified archaeological sites at the southern end of the island.

In 2004, the Navy conducted a study to identify potential TCPs on Kaʻula Island. The study relied on historical accounts, traditional Hawaiian texts, historical maps, ethnographic reports, and interviews with Hawaiian community members (Reference 4). The study identified three places as potential TCPs: (1) Kaʻula Island, (2) Keanaokū (also called Kūhaimoana), a cave recognized as home to a shark god, and (3) Kahālauloa, a heiau (sacred Hawaiian temple). Recent engagement with NHOs corroborates many of the findings in the 2004 TCP report.

Table 1: Summary of Archaeological Sites on Kaʻula Island

Site number	Site Feature(s)	Site Types	Probable Functions
50-70-99-01	Concrete foundation, historic materials	Historic era	Former U.S. Coast Guard lighthouse, 1932-1948
50-70-99-02	Terrace, stone rubble walls, modified cave, artifacts related to stone production (core and hammerstone), and branch coral	Hawaiian	Short-term habitation and/or used for ceremonial functions
50-70-99-03	Mound and two circular enclosures associated with short-term habitation; modern materials	Hawaiian; Historic era	Short-term habitation and/or used for ceremonial functions, and historic shelter
50-70-99-04	Two mounds and a rectangular-shape depression; modern materials	Hawaiian; Historic era	Possible remnant of Hawaiian structure, location appears to correlate with heiau on 1923 photograph (Reference 3: Figure 9)
50-70-99-05	Mound	Unknown	Lacked sufficient integrity for an interpretation of function and cultural affiliation
50-70-99-06	Cave with traditional Hawaiian octopus lure sinker preform made from locally	Hawaiian; Historic era	Utilized as a shelter and short-term habitation

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

	sourced olivine nodule; modern materials		

ENGAGEMENT WITH NATIVE HAWAIIAN ORGANIZATIONS

In accordance with Section VII.C. of the 2012 PA, the Navy is considering input from NHOs regarding additional historic properties on Kaʻula Island and has contacted NHOs, the Office of Hawaiian Affairs, and members of the academic community that may be able to share information about the historic and cultural significance of Kaʻula Island (Table 2). The Navy also invited NHOs to submit information in writing, if preferable.

A shared belief expressed by participating NHOs is that Kaʻula Island is a cultural resource, and the island is part of a landscape/seascape that is alive for the Hawaiian people. The island represents a familial connection to Hawaiians based on genealogical ties to the living environment. This connection is important because Native Hawaiians believe they must care for the island in similar fashion as they would care for their relatives. Kānaka Maoli, a term used to describe the native people of Hawaiʻi, have a reverential relationship with the living Earth. The cultural perspective of mālama ʻāina and aloha ʻāina, to care for the land and nature with sincere love and respect, is at the heart of Kānaka Maoli cultural traditions and customary practices.

According to Hawaiian tradition, Kaʻula Island is associated with cultural traditions related to the direction west, sunset, winter solstice, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, aliʻi (chief, nobility), fishing, navigation, migration, wind, transition, and symbolic associations of life and death.

The Native Hawaiian community knows Kaʻula Island as the location of Keanaokū, the cave of Kūhaimoana. This shark akua (god) or ʻaumakua (deified ancestor) is the traditional guardian of the waters of Kaʻula and Niʻihau. A large sea cave on the northwest side of Kaʻula Island is a key feature noted in interviews and historical accounts. NHOs also identify the presence of heiau on Kaʻula Island connected to the shark god. Some NHOs recognize that in the past three heiau were present nearby at a higher elevation east of the sea cave. The heiau Kahālauloa is likely the place Ka-hālau-a-Ola mentioned in several songs and chants and associated with the concept of revitalized life. Other heiau names include Kaneneʻeneʻe, Pahoku-pio, and Ka-unu. NHOs note the heiau and sea cave are places to perform cultural protocols.

Native Hawaiians have had a long-standing interaction with Kaʻula Island's natural environment. Participating NHOs recognize the island as a traditional place for intermittently collecting birds and feathers as well as olivine stone for fishing. Feathers collected from Kaʻula included those from the koaʻeʻula or red-tailed tropicbird. These feathers are considered special and were used in regalia. Native Hawaiians believe the island habitat serves as a nursery for birds, ensuring bird populations have a location to recover if needed. Birds from the island are essential because they help those fishing locate game fish in the area. NHOs maintain that natural resources on and around the island were vital support for the migration to and settlement of the Hawaiian Islands.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

The NHOs recognize the absence of human impact or presence on the island as indicative of the place's importance as wahi pana (sacred place). The more revered the location, the less traveled. Participating NHOs note visits to Kaʻula Island by members of the Hawaiian monarchy including Liholiho, Kalākaua, and Kapiʻolani. Some NHOs express strong interest in visiting Kaʻula Island to perform cultural protocols. Others expressed a desire to visit the island by ship only, being mindful to not contaminate the island or introduce invasive species.

The participating NHOs note Kaʻula Island is present in many Native Hawaiian mele (songs) and oli (chants). The island is often referred to in regards to vitality and life. Mele and oli also reference a canoe landing and two stone guardians on Kaʻula Island. In one chant, Kaʻula Island is referred to as "the house of wind." Some NHOs believe the island has a connection to the wind and its unpredictability.

Table 2: Native Hawaiian Contacts and Organizations

Contacts	**Organization/Association**
C. Kunane Aipoalani	Na ʻOhana Papa O Mānā
E. Kalani Flores	Flores-Case ʻOhana
Kamakana Ferreira	Office of Hawaiian Affairs
Kawaikapuokalani Hewett	Loea, Kumu Hula
Kekuewa Kikiloi	Nohopapa Hawaiʻi
Peleke Flores	Kiaʻi Kanaloa
Pelika Andrade	Nā Maka Onaona
Richard Keaoopuaokalani NeSmith	Researcher and Consultant
Robinson family	Niʻihau
Terrill James Kane Alii Williams	ʻOhana of Papapa of Niʻihau
Walter Ritte	ʻĀina Momona

DETERMINATION OF ELIGIBILITY

A traditional cultural place is defined as a building, structure, object, site, or district that may be eligible for inclusion in the NRHP for its significance to a living community because of its association with cultural beliefs, customs, or practices that are rooted in the community's history and that are important in maintaining the community's cultural identity (Ref. 5). Based on information provided by NHOs as well as archival, historical, and ethnographic research, the Navy has determined that Kaʻula Island is a site traditionally recognized as significant to Native Hawaiians because of its association with cultural beliefs, practices, and values. Native Hawaiian views related to Kaʻula Island are widely shared within the community and have been passed down through generations, thus serving an important role in maintaining the group's cultural identity.

While the Navy recognizes changes have taken place from historic activities, including lighthouse construction and military training activities, Kaʻula Island retains its integrity of location, setting, feeling, and association. The applicable National Register area of significance is Ethnic Heritage-Pacific Islander, Native Hawaiian. Kaʻula Island is historically important at the state level of significance with a period of significance from circa 1870 to present.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUAʻI, HAWAIʻI

As mentioned above, the Navy has determined that Kaʻula Island meets the essential characteristics of a TCP eligible for inclusion in the National Register (Reference 5). The Navy makes this assessment based on an understanding of the significance of Kaʻula Island as well as the physical and nonphysical aspects that characterize and convey the perspective of the Native Hawaiian community. Notably, the island itself possesses historical and cultural significance. Below is a list of character-defining features of Kaʻula Island with supporting information.

1. The island itself is associated with significant cultural traditions and events in Hawaiian history:
    - Kaʻula Island is a natural feature connected to the direction west, sunset, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, aliʻi, navigation, the wind, astronomy, transition, creation, and symbolic associations of life and death. Kaʻula is also part of Hawaiian astronomical architecture, and together with Niʻihau forms a winter solstice sightline from Kaunalewa Ridge on Kauaʻi;
    - The importance of Kaʻula Island as wahi pana is conveyed in creation stories, cosmology, and Native Hawaiian traditions of oli and mele. For NHOs, Kaʻula Island's physical location make it one of the older islands in the Hawaiian chain. Understood as a child of Papahānaumoku and Wākea, its origin, age, and genealogical ties to Native Hawaiians are a source of reverence; and
    - Native Hawaiians identify the island as essential to past traditional practice of collecting birds and feathers in addition to current practice of fishing in the waters surrounding Kaʻula Island and Niʻihau. NHOs note koaʻeʻula, or red-tailed tropicbirds, are specifically associated with Kaʻula and they identified birds of Kaʻula as a potential food supply and source for production of chiefly items, like ahuʻula (feather cape) or kāhili (feather standard).
2. Keanaokū, sea cave:
    - Home to the shark deity Kūhaimoana and an important place to perform cultural protocols.
3. Heiau (Kahālauloa, Kaneneʻeneʻe, Pahoku-pio, and Ka-unu):
    - Connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific;
    - Likely the place Ka-hālau-a-Ola in songs and chants and associated with the concept of revitalized life; and
    - Ethnographically associated with paying tribute to Kūhaimoana.

In consideration of the information provided above, and in accordance with Section VII.C. of the 2012 PA, Navy is now seeking concurrence from SHPO on this National Register eligibility determination of Kaʻula Island as a TCP for Section 106 purposes. The Navy respectfully requests SHPO's reply within 30 days of receipt or sooner. The Navy is also sending this letter to the above listed NHOs for comments on the TCP eligibility determination. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

5

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I

STEVENSON.BRETT.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2025.02.26 14:49:43 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Jessica Puff, State Historic Preservation Division
Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawai'i Environmental Director
Kamakana Ferreria, Office of Hawaiian Affairs Lead Compliance Specialist

Reference 1: Programmatic Agreement among Commander, Navy Region Hawai'i, the Advisory Council on Historic Preservation and the Hawai'i State Historic Preservation Officer regarding Navy Undertakings in Hawai'i. 2012.

Reference 2: *Field notes from Ka'ula Island*. Historic Sites Section, State Historic Preservation Division. Hommon, 1976.

Reference 3: *Final Report Archaeological Survey of Ka'ula Island*. Prepared by Ogden Environmental and Energy Services Co., Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i. Robins and Anderson, 2001.

Reference 4: *Final Report Ka'ula Island, Hawai'i: A Study of Potential Native Hawaiian Traditional Cultural Places*. Prepared by International Archaeological Research Institute, Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i Tuggle, 2004.

Reference 5: *National Register Bulletin: Identifying, Evaluating, and Documenting Traditional Cultural Places*. Update to National Register Bulletin 38. Issued by the National Register of Historic Places and National Historic Landmarks Program. National Park Service, U.S. Department of the Interior, 2024.

Subj: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I



Figure 1: Map of Ka'ula Island Traditional Cultural Place

7

DEPARTMENT OF THE NAVY
PACIFIC MISSILE RANGE FACILITY
P.O. Box 128
KEKAHA, HAWAII 96752-0128

11000
Ser N4F/0370
04-Jun-25

Ms. Dawn Chang
Chairperson, Department of Land and Natural Resources
State Historic Preservation Division
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawai'i 96813

SUBJECT: LAND-BASED TRAINING AND TESTING AT THE PACIFIC MISSILE RANGE FACILITY (PMRF), KAUA'I, HAWAI'I (HICRIS Project No. 2024PR01077)

Dear Ms. Chang:

The purpose of this letter is to provide an update on the Navy's continuing efforts to meet its responsibilities pursuant to Section 106 of the National Historic Preservation Act (NHPA) for the subject undertaking in accordance with the Navy's 2012 PA, as amended in 2024 (Reference 1) (hereinafter "2012 PA"). This letter provides the State Historic Preservation Officer (SHPO) with an opportunity to review the proposed area of potential effect (APE) and finding of effect for proposed activities on Ka'ula Island. As discussed in the letter dated February 26, 2025 (Reference 2), the Navy determined Ka'ula Island meets the criteria of a Traditional Cultural Place (TCP) eligible for listing in the National Register of Historic Places (NRHP) (hereinafter "Ka'ula Island TCP"). The Navy has received no official response from the SHPO to the determination of eligibility and no objections from any other consulting parties. As the 30-day review period has now closed, the Navy accepts the absence of SHPO response as concurrence with the determination.

The proposed undertaking includes training and testing activities conducted within established ranges at Pacific Missile Range Facility (PMRF) and at Ka'ula Island. The type of activities is consistent with current use. Increases in training and testing activities are included; however, no new types of training and testing activities and no new training areas are proposed. Specific to Ka'ula Island, proposed training would occur within the existing 10-acre inert impact area on the southern end of the island. The proposed undertaking may increase the number of annual air-to-ground gunnery exercises and air-to-ground bombing exercises from the Navy's historical average of 6 to a maximum of 24 and from 7 to a maximum of 31, respectively. Ka'ula Island serves as a contingency air-to-ground area for the Navy deploying units that may need to complete required training qualifications in Hawai'i. The proposed increased use of Ka'ula for training provides Air Force, Army, and Marine Corps the required expanded capability to train in a maritime environment; and this location offers local units an opportunity they have not had in the past.

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AREA OF POTENTIAL EFFECT

Kaʻula Island is a crescent-shaped islet approximately 22 miles southwest of Niʻihau. The 113-acre-island is about 1.5 km long and 0.1-0.3 km wide, and the highest point on the island is near the center. Training activities are limited to the 10-acre inert impact area located on the southern end of the island. In consultation with your office and Native Hawaiian stakeholders, the Navy has determined the island is a TCP eligible for listing in the NRHP due to its association with significant cultural traditions and events in Hawaiian history. Therefore, the Navy proposes the entire island comprises the APE for the purposes of this consultation (Figure 1). In compliance with Stipulation VI of the 2012 PA, the Navy requests SHPO's review of the proposed APE for proposed training activities on Kaʻula Island.

ENGAGEMENT WITH NATIVE HAWAIIAN ORGANIZATIONS

As part of ongoing engagement efforts pursuant to the 2012 PA, the Navy met with Native Hawaiian Organizations (NHOs), including the Office of Hawaiian Affairs, to seek input on the potential effects of proposed training to the Kaʻula Island TCP. In addition to the information that was shared during the meetings, the Navy also invited NHOs to submit information in writing. The Navy's proposed finding of effect considers the input and views expressed by NHOs participating throughout the Navy's Section 106 consultation engagement efforts. A summary of NHO input is included in Enclosure 1.

FINDING OF EFFECT

In accordance with Section IX of the 2012 PA, the Navy completed a review to determine whether the proposed undertaking has the potential to cause effects to the Kaʻula Island TCP. The review focused on potential effects caused by proposed activities to the TCP's three character-defining features: the physical island itself, the sea cave, and heiau (sacred Hawaiian temple). Kaʻula Island is associated with significant cultural traditions, practices, and events in Hawaiian history. The sea cave Keanaokū is home to the shark deity Kūhaimoana and an important place to perform cultural protocols and practices. The large sea cave is on the upper northwest side of the island. Heiau on the island, generally, are connected to historical traditions, including navigation, migration, and settlement throughout the archipelago and Pacific. As many as three heiau are identified in reports, historical accounts, and recent meetings, all are described as being on the northern side of the island (Reference 3; Reference 4). Consistent with past training activities, future training is limited to the 10-acre inert impact area on the southern end of the island.

Per 36 C.F.R. § 800.5(a)(1), an adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. The aspects of integrity contributing to the eligibility of Kaʻula Island are location, setting, feeling, and association.

Potential effects to the sea cave and heiau would be avoided because these features are on the island's northern side, well outside the area where proposed training activities would take

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place. Since the proposed undertaking includes no new areas or new types of training activities, no direct or indirect effects are expected to impact the northern side of the island where the sea cave and heiau exist. Thus, the proposed undertaking will not alter these character-defining features allowing them to retain their integrity of location, setting, feeling, and association.

The review also focuses on potential effects on the island itself. Specifically, the impacts to natural or physical features of the island and its associated cultural traditions are key interest areas raised by the consulting parties that warrant investigation. To assess the potential for physical damage to Kaʻula Island, the Navy reviewed reports and high-resolution aerial photography of the island with a detailed inspection of the inert impact area. Photographs show remnants of inert munitions largely resting on the ground surface with a small number embedded into the ground because an inert round fired does not have the same percussive impact of an explosive round. Cratering or significant physical disturbances to the ground surface from the impacts are not detectable in the aerial views. The analysis suggests that use of inert ordnance results in minimal physical damage to the island, thus having no adverse effects on this aspect of Kaʻula Island's integrity.

Another potential effect includes the introduction of visual, atmospheric, or audible elements that could diminish the integrity of the historic property. Although audible elements are expected to occur during proposed training, these sounds would be brief and temporary and would not rise to the level of adverse effect. Visual and atmospheric elements introduced during proposed training on Kaʻula Island include debris from inert munitions. As cleanup of inert munitions is not part of proposed activities, the accumulation of inert munitions debris affects aspects of integrity such as setting and feeling of the island. Setting is the physical environment of the TCP and refers to the character of the place in which the property played its historical role. Kaʻula Island is regarded by participating NHOs as wahi pana, a sacred place celebrated and storied in the cultural traditions of Hawaiʻi. The island is noted for its sacred and remote landscape as well as natural resources traditionally utilized by Native Hawaiians such as birds, their eggs and feathers, and olivine stones used to make fishing lures. The expended munitions remaining on the island is not congruent with the basic physical conditions understood historically as a revered landscape. Feeling is a nonphysical aspect of integrity that is a place's expression of the aesthetic or historic sense of a particular period. Participating NHOs regard Kaʻula Island as a family member, and the presence of physical and natural features, collectively, reflect Native Hawaiians' spiritual values and genealogical ties. Our review of potential effects, along with consideration of NHO perspectives, indicates that the proposed increase in activities will introduce additional visual and atmospheric elements that diminish the integrity of setting and feeling and will adversely affect the Kaʻula Island TCP.

Lastly, the Navy's review identified change in access to the Kaʻula Island TCP as a potential adverse effect. NHOs express a fundamental desire to visit the island to safely resume traditional practices at the TCP. They would achieve this by performing cultural protocols, confirming interpretations of archaeological sites from NHO viewpoints, observing heiau, collecting feathers, and conducting traditional practices as documented in mele (songs) and oli (chants). While NHOs may not have had physical access to the island in recent years (limiting or negating cultural practices), they maintain their cultural traditions associated with Kaʻula Island

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and continue to value the island as a TCP. In accordance with 36 C.F.R. § 800.5(a)(2)(iv), adverse effects on historic properties may include a change of the character of the property's historic use or of physical features within the property's setting that contribute to its historic significance. Further limiting NHO access to the island will adversely affect the Kaʻula Island TCP.

In accordance with Section VI of the 2012 PA, the Navy is now seeking concurrence from SHPO on this determination of the APE for Section 106 purposes. Further, the Navy requests SHPO promptly provide any advice or comment that it has regarding the findings of effect as detailed above. We plan to initiate consultation to resolve the adverse effects in accordance with Stipulation IX.C.1 of the 2012 PA and 36 C.F.R. § 800.6. The Navy respectfully requests SHPO's reply within 30 days of receipt. The Navy is also sending this letter to NHOs for comments on the finding of effect. The point of contact for this undertaking is PMRF Cultural Resources Manager, Ms. Tara del Fierro, at tara.m.delfierro.civ@us.navy.mil.

Sincerely,

STEVENSON.BRET T.ASHLEY.1158727311 Digitally signed by STEVENSON.BRETT.ASHLEY.1158727311 Date: 2025.06.04 15:47:10 -10'00'

B. A. STEVENSON
Captain, U.S. Navy
Commanding Officer

Copy to: Jessica Puff, State Historic Preservation Division
Susan Lebo, Ph.D., State Historic Preservation Division
Dan McNair, U.S. Pacific Fleet (N465), Environmental Readiness
William Manley, Navy Region Hawaiʻi Environmental Director
Kamakana Ferreira, Office of Hawaiian Affairs Compliance Archaeologist
C. Kunane Aipoalani, Na ʻOhana Papa O Mānā
E. Kalani Flores, Flores-Case ʻOhana
Kawaikapuokalani Hewett, Loea, Kumu Hula, Direct Descendant of Kūhaimoana
Kekuewa Kikiloi, Nohopapa Hawaiʻi
Peleke Flores, Kiaʻi Kanaloa
Pelika Andrade, Nā Maka Onaona
Richard Keaoopuaokalani NeSmith, Researcher and Consultant
Robinson Family, Niʻihau
Kane Alii Williams, ʻOhana of Papapa of Niʻihau, Direct Descendant of Kūhaimoana
Walter Ritte, ʻĀina Momona

Reference 1: Programmatic Agreement among Commander, Navy Region Hawaiʻi, the Advisory Council on Historic Preservation and the Hawaiʻi State Historic Preservation Officer regarding Navy Undertakings in Hawaiʻi. 2012, as amended in 2024.

Reference 2: Navy's determination of eligibility letter to SHPD, February 2025.

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Reference 3: *Final Report Archaeological Survey of Ka'ula Island.* Prepared by Ogden Environmental and Energy Services Co., Inc. for Department of the Navy Pacific Division Naval Facilities Engineering Command Pearl Harbor, Hawai'i. Robins and Anderson, 2001.

Reference 4: Niihau: The Traditions of an Hawaiian Island. Mutual Publishing, Honolulu. Tava and Keale, 1989.

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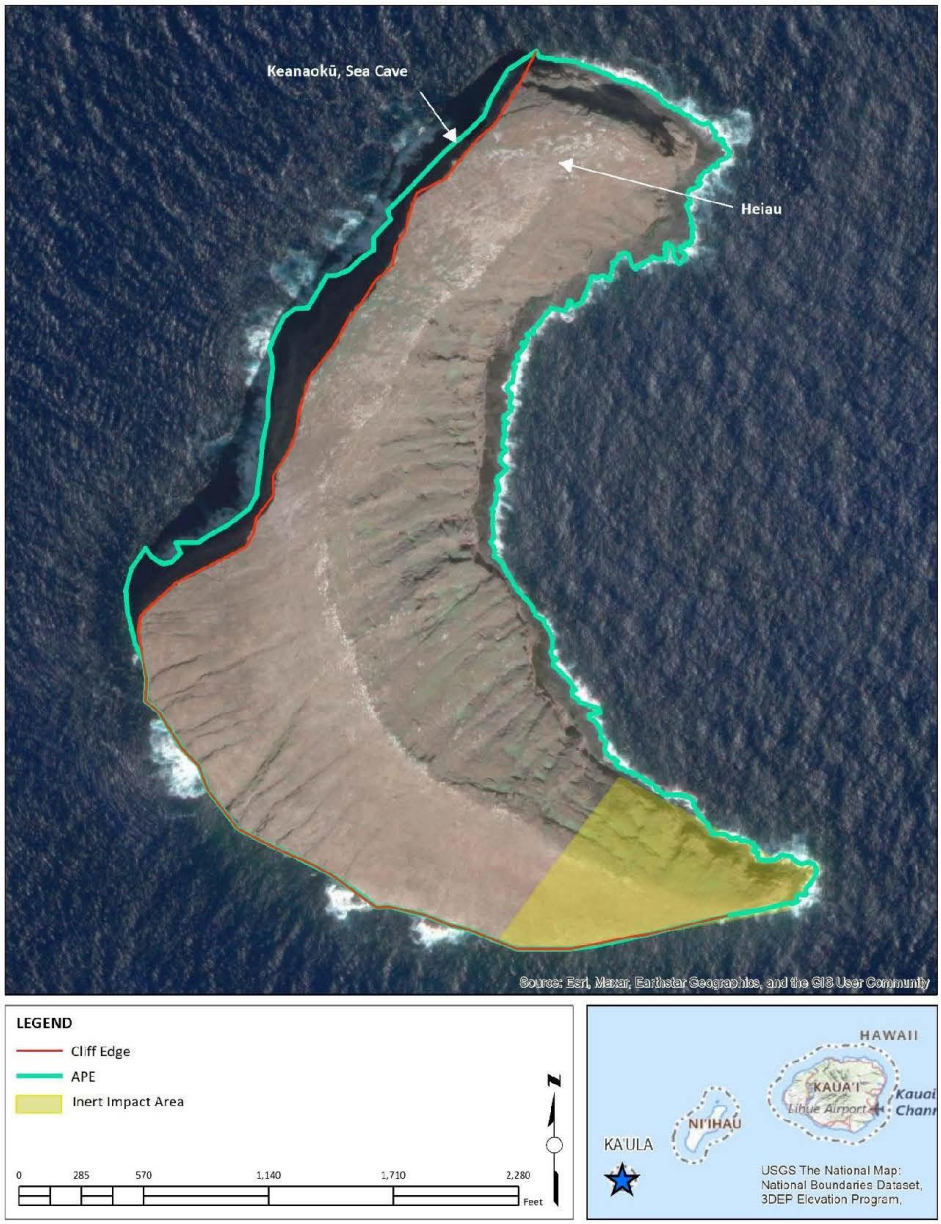


Figure 1: Map of Area of Potential Effect

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ENCLOSURE 1: Summary of Input from Native Hawaiian Organizations (NHOs)

Native Hawaiians expressed a range of cultural, environmental, and spiritual concerns regarding effects of military training activities on Kaʻula Island. These concerns, articulated during a series of consultation meetings, are grounded in deep ancestral, cultural, and spiritual connections to the island. Note that some of these concerns do not pertain to the National Historic Preservation Act Section 106 process; however, they are included in an effort to present the most prevalent input from NHOs. Below are the primary concerns.

Cultural Connections and Spiritual Significance	Kaʻula Island is regarded as sacred by many Native Hawaiians. NHOs highlighted the importance of Kaʻula as a wahi pana (sacred place) and stressed that it should be honored and cared for as kupuna (ancestral/familial relationship).
	One NHO provided historical evidence of their genealogical relationship to the island and Kūhaimoana (shark akua [god] or ʻaumākua [deified ancestor].
	Military training exercises are seen as desecrating a sacred site, violating traditional beliefs and cultural practices that emphasize respect for and stewardship of the land. For some NHOs, the training exercises create emotional and spiritual harm.
	The importance of the island is conveyed in traditional Hawaiian forms such as mele (songs), moʻolelo (narrative stories), and oli (chants) with connections to the direction west, sunset, the deities Pele, Kūhaimoana, Kāne, and Kanaloa, aliʻi, navigation, the wind, astronomy, transition, creation, and symbolic associations of life and death.
Environmental and Ecological Damage	Kaʻula is home to native seabird populations and marine life. NHOs are concerned that military exercises can potentially lead to habitat destruction, pollution, and disruption of wildlife.
	The presence of unexploded bombs poses long-term risks to both the environment and safety of Native Hawaiians who want to visit the site.
	Remnants of inert munitions create environmental hazards not compatible with the island's ecological and physical conditions.
Access Restrictions	Native Hawaiians are denied access to the island for traditional cultural practices such as spiritual observances, religious practices, and navigation training because of military use and safety concerns.
	NHOs emphasized that Kaʻula Island needs to be accessible to Kānaka Maoli (Native Hawaiians) to satisfy educational needs and substantiate historical accounts.
	Access would allow NHOs to verify traditional knowledge as transmitted in oral traditions and to observe and verify existence and condition of the sea cave and heiau.
	Some NHOs requested on-land access, while others expressed a desire to visit the island by ship only to avoid contamination or introduction of invasive species.
	NHOs conveyed a sense of neglect and loneliness based on the inability to visit the site.
Sovereignty and Self-Determination	There is concern that continued military control over Hawaiian lands, including Kaʻula Island, perpetuates historical injustices stemming from the illegal overthrow of the Hawaiian Kingdom.

From: Alexis Clark <aclark@achp.gov>
Sent: Wednesday, August 13, 2025 8:37 AM
To: Marceaux, Paul Shawn CIV USN COMNAVFACSYSCOM (USA)
[redacted]
Cc: Del Fierro, Tara M CIV USN PMRF KEKAHA HI (USA)[redacted]; McNair, Brianne N CIV USN NAVFAC PAC PEARL HI (USA)[redacted]; Whitehouse, Brian P CIV USN COMPACFLT (USA)
[redacted]
Subject: [Non-DoD Source] RE: [External] e106 form for Pacific Missile Range Facility Land-based Training and Testing

Good afternoon Shawn,

The ACHP is in receipt of the Navy's notification that it will be following the 2012 Programmatic Agreement for Navy undertakings in Hawaii to comply with Section 106 for land-based training and testing at the Pacific Missile Range Facility. We have no comments on the proposal at this time.

Thanks,

Alexis

Alexis Clark

Assistant Program Analyst

Advisory Council on Historic Preservation

401 F Street NW, Suite 308, Washington, DC 20001

[redacted]

www.achp.gov

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Appendix D: Public Comments and Responses

Environmental Assessment

Pacific Missile Range Facility

Land-Based Training and Testing

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APPENDIX D PUBLIC COMMENTS AND RESPONSES D-1

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List of Figures

There are no figures in this appendix.

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Appendix D Public Comments and Responses

Agencies are required to involve the public in preparing and implementing their National Environmental Policy Act (NEPA) procedures. The Navy prepared a Draft Environmental Assessment (EA) to inform the public of the Proposed Action and to allow the opportunity for public review and comment over a 30-day period.

A Notice of Availability (NOA) of the Draft EA and public comment period was published on August 30, 2024. The NOA was published in the *Garden Island* and the *Honolulu Star Advertiser* newspapers (between August 30, 2024, and September 4, 2024). The newspaper advertisements included information about the availability of the Draft EA for review and comment, public involvement opportunities, and the open-house public meeting. On September 12, 2024, the Pacific Missile Range Facility (PMRF) Public Affairs Officer distributed a news release with information about the public meeting, scheduled for September 17, 2024, to local media outlets. A public meeting was held on September 17, 2024, at the Kauai Veterans Center in Lihue. The Draft EA was available for download on the project website, at the public meeting in CD and hard copy format, and at the Waimea Public Library and Lihue Public Library.

Additionally, the public could submit comments to three email addresses: PMRF-LBT-EA-Comments@us.navy.mil, PMRF.LBY.EA.Comments@us.navy.mil, and CPF-Environmental-PA@us.navy.mil, during the 30-day Draft EA public review and comment period. Navy staff monitored the email, and comments were compiled and submitted to project team members frequently.

The Navy received a total of 1,889 comment letters, form letters, and emails from agencies, organizations, elected officials, and the public. Each comment was reviewed and categorized into specific topics representing the general issues or concerns expressed during the public review and comment period. Following review by the project team and appropriate subject matter experts, responses to the topics were provided. Substantive comments were considered in the Final EA, and additional engagement with community groups, Native Hawaii Organizations (NHOs), and elected officials was carried out by the Navy, where appropriate.

Table D-1 includes the representative comment topics and associated responses from the Navy.

Table D-1: Responses to Public Comments on the Pacific Missile Range Facility Land-Based Training Draft Environmental Assessment

Comment Topic	Navy Response
Remove Gunnery Exercise (GUNEX) and Bombing Exercise (BOMBEX) activities at Kaula Island as it is a culturally significant location to Native Hawaiians and a protected wildlife sanctuary with species endemic to the Hawaiian Islands.	During the public commenting period of the Draft EA, the Navy received comments from members of the Native Hawaiian community, Native Hawaiian Organizations (NHOs), and the public expressing concerns about continued use of Kaula Island by the military for training activities associated with the undertaking. In response to these comments, and in accordance with the 2012 Programmatic Agreement (PA), the Navy is engaging with NHOs, the Office of Hawaiian Affairs (OHA), and State Historic Preservation Division (SHPD) to gather additional information about Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. Subsequently, the Navy determined Kaula Island meets the criteria of a Traditional Cultural Place (TCP) eligible for listing on the National Register of Historic Places (NRHP) and determined that the proposed undertaking would adversely affect the Kaula Island TCP. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the Advisory Counsil on Historic Properties (ACHP), in an effort to resolve adverse effects and develop a Memorandum of Agreement (MOA) in accordance with Stipulation IX.C.1 of the 2012 PA and 36 Code of Federal Regulations (CFR) section 800.6. Additional information is included in Sections 3.6.4.1.2 and 3.6.5.2.2 of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence). While the island has been under federal jurisdiction since 1924, the Navy training activities analyzed in this EA at Kaula Island have been occurring since 1952. The Navy stopped using explosive munitions on Kaula Island by at least 1981. Only gunnery and bombing (using non-explosive ordnance only) from aircraft within the southernmost 11-acre area (approximately 8 percent of the island) are permitted; there is no firing on the island from vessels. The EA indicates a baseline amount of activity that is actually less than what was analyzed in both the 1999 PMRF Enhanced Capability Environmental Impact Statement (EIS), and the 2008 Hawaii Range Complex (HRC) EIS, when these activities were last considered for environmental impacts. During pre-planning of this EA, the Navy reviewed historical records to better understand the extent of past Navy usage. Other services also identified new training requirements, fulfilled by GUNEX and BOMEX activities at Kaula Island, which allows for training in a controlled environment with reduced safety risk. Since release of the Draft EA in August 2024, the Navy has further reviewed the usage of Kaula

Comment Topic	Navy Response
	Island over the past 13 years and found that the annual average utilization is 67 percent less for GUNEX activities and 97 percent less for BOMBEX activities than what was permitted in the 2008 HRC EIS. Following a review of the last 13 years of historical usage data, the Navy determined that proposed GUNEX and BOMBEX training activities at Kaula Island are essential for maritime conflict where islands can serve as strategic and logistic hubs; As discussed in Section 2.2.2.2 (Eliminating Military Training Activities on Kaula Island), the Navy considered eliminating training on Kaula Island. The island is a key asset for rapidly developing combat proficiency for Hawaii-based forces and those surging from the continental United States (CONUS). It is also the only location within the Hawaiian Islands where overwater training can occur using inert weapons. As such, Kaula Island is considered an irreplaceable training site for several reasons: • The island's proximity to the Hawaiian Islands provides an opportunity for increased training capacity for both resident forces and those converging in the area before deploying west. It is the most logistically sensible location for training and certifying aircraft before they proceed toward the Western Pacific. • The impact area on the southern tip of Kaula Island is the only sea-to-shore land-based target in the HRC that can support laser-guided, non-explosive training rounds and a variety of inert weapons up to 500 pounds. It is also part of an unparalleled combination of land ranges, operating areas, undersea terrain, and military airspace. This combination is essential for the realistic and effective training needed to certify naval forces for combat operations. • While other ranges exist in CONUS or the Mariana Islands, they are not viable alternatives for all training. For instance, the Farallon de Medinilla (FDM) range is 6,200 miles further west from the coast of CONUS. Using FDM for inert weapons training would create scheduling challenges. Additionally, requiring Hawaii-based units to return to CONUS to train at sites like San Clemente Island is less efficient and more costly due to fuel consumption. • The only other land-based target training location in the HRC is the Pohakuloa Training Area (PTA). However, PTA does not provide the necessary sea-to-shore transition required for certain training qualifications. Furthermore, its availability is subject to inter-service demand, which could lead to scheduling challenges for Navy units.

Comment Topic	Navy Response
	A reduction or termination of access to Kaula Island would significantly impact the readiness and mission effectiveness of units in the U.S. Indo-Pacific Command (INDOPACOM) area of responsibility (AOR). Maintaining the Kaula Island target range is critical for the tactical combat training of Navy, Marine Corps, Army, and Air Forces to develop proficiency in long-range overwater strikes. This training is essential for forces to respond to contingencies in the Western Pacific or threats against the Hawaiian Islands or the continental United States. The island serves as a critical asset for rapidly developing combat proficiency for Hawaii-based forces and forces surging from CONUS, enabling them to meet accelerated timelines and be combat-ready before entering the weapons engagement zone of peer competitors to the west. GUNEX and BOMBEX activities (using non-explosive ordnance only) remains essential to provide trainees with the realism and complexity required to develop physical skills, improve teamwork, increase adaptability, manage risk, and account for human factors (e.g., physical fatigue, fear) as part of training. It complements and enhances the overall training experience, ensuring comprehensive readiness for real-world operations. Simulation that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action due to its significant limitations. The Navy and other Services already use simulation in training and testing whenever possible. Unlike live training, simulated training does not provide the requisite level of realism necessary to attain combat readiness and cannot replicate the high-stress environment encountered during combat operations. Furthermore, operational training and testing cannot be based exclusively on computer modeling or simulation (see 10 United States Code [U.S.C.] sections 4171 and 4172). Training activities under the Proposed Action are not anticipated to have a significant impact on wildlife or cultural resources on Kaula Island. The full analysis of impacts to these resources, and relevant consultations under Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA), can be found in Section 3.5 (Terrestrial Biological Resources) and Section 3.6 (Cultural Resources).
The Proposed Action is a continuation of military negligence experienced in the past rather than promoting peace and good faith.	The Navy and PMRF installation personnel take environmental stewardship seriously, and the primary objective during training and testing activities is the safety of servicemembers and the protection of the natural environment and wildlife. Robust Standard Operating Procedures (SOPs) and conservation measures are implemented as part of each training and testing event. At PMRF this includes, but is not limited to, educating range users on the natural and cultural sensitivity of the base prior to activities, onsite monitoring for cultural and natural resources during applicable training and testing activities, and seasonal and temporal operational limitations (associated with the Dark Skies program that runs

Comment Topic	Navy Response
	every year from September 15 to December 15). On Kaula Island, only non-explosive practice munitions are permitted, and training activities would only continue to occur within the southernmost 11 acres (8 percent) of the island. Additional range requirements for Kaula Island include the following: 1. Activities shall not impact the waters around Kaula Island. 2. Before firing by any aircraft, pre-surveys are conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island, or if monk seals are on the ledges around the southern inert ordnance impact area. If any of the above mentioned are determined to be present, no firing will take place until areas are cleared. Units cannot attempt to provoke clearing of marine mammals. 3. No aircraft are permitted to land on Kaula Island. 4. To avoid bird strike, aircraft are to remain above an altitude of 1,000 feet (ft.) 5. Units must immediately report inadvertent ordnance put into the waters surrounding Kaula Island. 6. For a scheduled event, a Local Notice to Mariners (LNM) is published on the U.S. Coast Guard website (https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/) a minimum of five business days prior to an event at Kaula Island to close the surrounding sea space. The durations of closures vary and are dependent on the activity being conducted. Additionally, a Notice to Airmen (NOTAM) is issued by the Federal Aviation Administration (https://notams.aim.faa.gov/notamSearch/nsapp.html#/) to close the airspace surrounding Kaula Island. The training and testing activities under the Proposed Action would be a continuation of what has been conducted at Barking Sands and Kaula Island for decades. No new types of training or testing activities would be introduced and impacts are not anticipated to result in any adverse environmental or health effects to the public. In addition, the Navy is consulting with NHOs, SHPD, and the OHA under the 2012 PA (see Appendix C, Agency Correspondence). For natural resource conservations, the Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* plant and its designated habitat on Barking Sands, or the band-rumped storm

Comment Topic	Navy Response
	petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* plant on Kaula Island. (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence). Descriptions of these consultations can be found in Section 3.5 (Terrestrial Biological Resources) and Section 3.6 (Cultural Resources). Additionally, the Navy met with the USFWS Migratory Bird Treaty Act (MBTA) office in November 2024 to discuss the Proposed Action as it relates to migratory birds; the Final EA was updated in accordance with the outcome of that discussion.
The military would be using explosive munitions during training exercises.	Certain training and testing activities conducted on Barking Sands could use explosive munitions, such as missile, rocket, and aerial drone launch activities. However, there are no explosives detonated at Barking Sands; all explosions would occur at sea, well over 3 miles away from PMRF. At-sea training impacts are evaluated in other NEPA documents that evaluate in-water training and testing; see entries 4 and 5 in Table 4.1-1 in the Final EA for additional information. Additionally, these activities currently occur at Barking Sands and have established SOPs and management measures to avoid or minimize effects resources, as analyzed in the Final EA. The use of explosives at Kaula Island is not authorized. Therefore, there would be no explosive munitions used in any training activities conducted at Kaula Island. Additionally, it should be noted that explosive munitions have not been authorized for use at Kaula since at least 1981, and no new types of training or testing activities would be introduced under the Proposed Action.
The Proposed Action goes against ongoing reconciliation efforts between the U.S. government and Native Hawaiians and violates Native Hawaiian rights.	Your comments regarding Native Hawaiians are noted. However, reconciliation efforts between the U.S. government and Native Hawaiians are beyond the scope of the EA process. In the NHPA process, consultation with NHOs provided important information about cultural perspectives regarding a variety of resources that have religious and cultural significance to Native Hawaiians. This information from NHOs has been taken into account and considered in analyses and findings. The Navy is committed to protecting the environment during its training and testing activities. An archaeological survey was completed across all accessible terrain on Kaula by Robins & L. Anderson in 2001. Excluding the steep cliffs and eroding slopes encircling the island, and areas inaccessible due to high winds and ground surface instability, archaeologists surveyed approximately 36 acres or 50 percent of the accessible surface of the island. Six archaeological sites were recorded on Kaula Island; none of the identified sites were recorded within the training area on the southern portion of the island.

Comment Topic	Navy Response
	For this Proposed Action, the Navy is meeting the responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (see Appendix C, Agency Correspondence) (U.S. Department of the Navy, 2012c). During the public commenting period of the Draft EA, the Navy received comments from members of the Native Hawaiian community, NHOs, and the public expressing concerns about continued use of Kaula Island by the military for training activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kuhaimoana, the Shark God who lives in a large underwater cave known as Keanaoku. NHOs also recognize the island as a traditional place used by Native Hawaiians for collecting natural resources, including bird feathers and stone used in traditional octopus lures. Additionally, comments indicated that cultural practices, such as navigation and subsistence fishing, are conducted in the vicinity of Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance on Kaula Island. Subsequently, the Navy determined Kaula Island meets the criteria of a TCP eligible for listing in the NRHP and determined that the proposed undertaking would adversely affect the Kaula Island TCP. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties; and notified the ACHP, in an effort to resolve adverse effects and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 and 3.6.5.2.2 (Kaula Island), as well as Appendix C (Agency Correspondence).
An EIS must be prepared to more thoroughly identify and analyze impacts from the Proposed Action	In accordance with NEPA, an EA is prepared for a proposed action that is not likely to have significant adverse effects on the human or natural environment or when the significance of the effects is unknown. The Proposed Action is largely a continuation of ongoing activities conducted at Barking Sands and Kaula Island. Based on the analysis presented in this EA, public comments received, and consideration of the best available science and information, the findings do not indicate any significant impacts would occur to the human or natural environment; therefore, the preparation of an EIS is not required. Potential effects from land-based training and testing are analyzed in Chapter 3 (Affected Environment and Environmental Consequences) of this EA. All training activities would be conducted in accordance

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	with rules and regulations as established by the installation, Services, and relevant consultations, as well as existing SOPs as discussed in Section 2.3 (Standard Operating Procedures Included in the Proposed Action) of the EA to avoid or reduce potential impacts from the Proposed Action.
No other alternatives, including those with a lesser carbon footprint, were considered other than No Action.	Reasonable alternatives for this EA were determined based on the criteria that an alternative should be technically and economically practical or feasible and meet the purpose and need for the Proposed Action. In developing the Proposed Action, the Navy engaged with the Army, Air Force, Marine Corps, and the Missile Defense Agency (MDA) to identify training and testing activities that were not being supported at other locations and for which PMRF was already supporting due to the availability of facilities and range assets. These activities were then assessed based on increased tempo requirements against factors of safety, range capability, and capacity given current operational and testing scheduling and deconfliction. Based on this assessment, the Navy determined the tempo of training and testing activities that PMRF could support into the reasonably foreseeable future. The proposed tempo under the Proposed Action is what is reasonably feasible at PMRF and is the minimum necessary for the services to fulfill their Title 10 responsibilities. It is for these reasons that no other action alternative was carried forward for analysis. PMRF is the most practical and only feasible location within Hawaii to conduct the multi-service land-based training and testing activities listed in this Proposed Action, as it is an existing range that offers diverse and multi-dimensional capabilities and allows range users to develop and maintain high levels of military readiness. Training at Kaula Island allows for over-water air-to-ground training for services in a controlled, maritime environment that is not available at other locations in the HRC. No other location in the Pacific offers the necessary combination of land ranges, operating areas, undersea terrain, and military airspace to provide the venues for realistic training and testing needed to certify naval forces for combat operations should they fail to be certified in Southern California. As such, its proximity to the Hawaiian Islands allows for increased training capacity for both Hawaii-based forces and units converging in the area before deploying west. Other ranges are not viable alternatives for this type of training and testing due to their location and the costly movement of Hawaii-based units traveling significant distances to accomplish training and testing at these alternate locations. Simulation, although utilized whenever possible by the Services, has significant practical and operational limitations, and cannot replace live training and testing. Therefore, only the Proposed Action and No Action have been evaluated. Refer to Section 2.2 (Screening Criteria) for details on screening criteria that were developed to determine potential alternatives.

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Lack of justification that there aren't other locations within the U.S. to practice the necessary training.	As described in Chapter 2 (Description of Proposed Action and Alternatives), alternate training and testing locations were considered in the development of the Draft EA. The activities covered by this EA will help reinforce joint competencies, close gaps, and improve capabilities across all services. Barking Sands and Kaula Island allow controlled, safe operational areas for the various training and testing activities. Training at Kaula Island allows for over-water air-to-ground training for services in a controlled maritime environment that is not available at other locations in the HRC. As discussed in detail in Section 2.2.2.1 (Alternative Training and Testing Locations), no other location provides a combination of air, surface, and undersea space as well as access to land ranges. There are no other integrated ranges in Hawaii that afford the required level of operational support and comprehensive integration of training and testing activities. Thus, PMRF is the most practical and only feasible location within Hawaii to conduct the multi-service land-based training and testing activities listed in this Proposed Action.
Lack of justification to increase training and testing activities, specifically bombing on Kaula Island.	The tempo and types of training and testing activities at PMRF have fluctuated over the years because of the introduction of new technologies, the evolving nature of international events, advances in training and warfighting doctrine and procedures, evolving joint exercise cycles, and changes in force structure (e.g., organization of ships, weapons, and personnel). Such developments influence the frequency, duration, intensity, and location of required training and testing activities at PMRF, including the use of Kaula Island. In developing the Proposed Action, the Navy engaged with the Army, Air Force, Marine Corps, and the MDA to identify training and testing activities that were not being supported at other locations and for which PMRF was already supporting due to the availability of facilities and range assets. These activities were then assessed based on increased tempo requirements against factors of safety, range capability, and capacity given current operational and testing scheduling and deconfliction. Based on this assessment, the Navy determined the tempo of training and testing activities that PMRF could support into the reasonably foreseeable future. The proposed tempo under the Proposed Action is what is reasonably feasible at PMRF and is the minimum necessary for the services to fulfill their Title 10 responsibilities and training requirements. While Kaula Island has been under federal jurisdiction since 1924, the training activities analyzed in this EA at Kaula Island have been occurring since 1952. The Navy stopped using explosive munitions on Kaula Island by at least 1981. Only gunnery and bombing exercises (using non-explosive ordnance

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	only) from aircraft within the southernmost 11-acre area (approximately 8 percent of the island) are permitted; there is no firing by vessels. • In response to public comments on the Draft EA, the Navy considered eliminating training on Kaula Island (refer to Section 2.2.2.2, Eliminating Military Training Activities on Kaula Island); laser-guided, non-explosive training rounds; and inert weapons up to 500 pounds. • While other ranges exist in the CONUS or the Mariana Islands (FDM), they are not viable alternatives for all training. The FDM range is 6,200 miles further west, which is not a practical option for surging forces in combat because it is already within the Chinese military weapons engagement zone. Relocating Hawaii-based units to CONUS for training is also inefficient and costly due to fuel consumption. • Eliminating access to Kaula Island would have a tangible negative impact on mission effectiveness, including reduced unit qualifications in fire support, decreased deterrence, and limited operational flexibility. This loss would create a gap in the ability to train Hawaii-based forces to defend the islands and surge in a timely manner for combat operations. If these capabilities are phased out, rebuilding them would be costly and time consuming, leading to combat capability gaps in future conflicts. The only other training location in the HRC, PTA, does not provide the sea-to-shore transition required for certain training qualifications; in addition, its availability is limited due to inter-service demand. Therefore, eliminating military training activities on Kaula Island does not meet the purpose of and need for the Proposed Action. The proposed tempo of BOMBEX activities in this EA is less than what was analyzed in both the 1999 PMRF Enhanced Capability EIS and the 2008 HRC EIS, when this activity was last considered for environmental impacts. Since release of the Draft EA in August 2024, the Navy has further reviewed the usage of Kaula Island and found that the annual average utilization is 67 percent less for GUNEX activities and 97 percent less for BOMBEX activities than what was permitted in the 2008 HRC EIS (see Table A-12 and Table A-14 in Appendix A, Military Readiness Activity Descriptions). Table 2.1-3 has been updated to include the number of annual activities permitted under existing environmental coverage for GUNEX and BOMBEX activities at Kaula Island. Other services' needs were factored into the proposed training and testing tempo (see Table 2.1-1 and 2.1-3 in the Draft EA) based on the historic usage; as such, the tempos of proposed training and testing activities have been retained and are analyzed accordingly in the Final EA. NEPA does not set thresholds for activities, but rather but rather requires the analysis of the reasonably foreseeable

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	tempo to understand the degree of impact. Through recording of scheduled events, the Navy monitors usage to know if anticipated tempo is met, underachieved, or overachieved. It should be restated that the tempo of BOMBEX events are much lower than previously analyzed and covered in 1999 and 2008 environmental documentation. GUNEX and BOMBEX activities (using non-explosive ordnance only) remains essential to provide trainees with the realism and complexity required to develop physical skills, improve teamwork, increase adaptability, manage risk, and account for human factors (e.g., physical fatigue, fear) as part of training. It complements and enhances the overall training experience, ensuring comprehensive readiness for real-world operations. Simulation that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action due to its significant limitations. The Navy and other Services already use simulation in training and testing whenever possible. Unlike live training, simulated training does not provide the requisite level of realism necessary to attain combat readiness and cannot replicate the high-stress environment encountered during combat operations. Furthermore, operational training and testing cannot be based exclusively on computer modeling or simulation (see 10 U.S.C. sections 4171 and 4172).
General opposition to the Proposed Action and the No Action Alternative should be implemented	Implementation of the No Action Alternative would not meet the Navy's purpose of and need for the Proposed Action, which is to provide U.S. military services and MDA with land-based, multi-domain training and testing at a level that supports military readiness into the reasonably foreseeable future, and to ensure U.S. military services and MDA are able to organize, train, and equip service members and personnel to meet their respective national defense missions in accordance with their congressionally mandated requirements, as set forth in 10 U.S.C. Section 7062 (Army), 10 U.S.C. Section 8062 (Navy), 10 U.S.C. Section 8063 (Marine Corps), 10 U.S.C. Section 9062 (Air Force), and 10 U.S.C. Section 205 (MDA).
Use of simulators for training and testing activities.	Simulation that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action due to its significant limitations. The Navy and other Services already use simulation in training and testing whenever possible (e.g., command and control exercises are conducted without operational forces); however, its use cannot replace live training or testing as it does not provide the requisite level of realism necessary to attain combat readiness and cannot replicate the high-stress environment encountered during combat operations. Simulation has provided valuable training for service members in specific limited training situations. However, the numerous variables that affect the outcome of any given training cannot be

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	simulated with a high degree of fidelity. Air-to-ground gunnery and bombing training needs to be practiced to ensure precision and to experience the high performance and pressured scenarios that could be faced in real combat. The controlled environment that Kaula Island provides for this type of training allows for appropriate safety measures to be implemented to protect humans and wildlife. Military readiness training must be as realistic as possible to provide the experiences vital to success and survival during military operations because simulated training, even in technologically advanced simulators, cannot duplicate the complexity faced by military service members in the real world. While simulators and synthetic training are critical elements that provide early skill repetition and enhance teamwork, there is no substitute for live training and testing in a realistic environment. Furthermore, operational training and testing cannot be based exclusively on computer modeling or simulation (see 10 U.S.C. sections 4171 and 4172).
Reduce military footprint and conduct remediation and restoration efforts in the Hawaiian Islands.	Reduction in military footprint, and remediation and restoration of the effects from past military activities at Barking Sands and Kaula Island are beyond the scope of NEPA and this EA. The Proposed Action and designated training and testing areas are what is reasonably feasible at Barking Sands and Kaula Island and is the minimum necessary for the services to fulfill their Title 10 responsibilities and training requirements. The Navy complies with all applicable environmental laws and regulations for the training and testing activities proposed within the Study Area.
Increased military training and testing would make Hawaii a target.	Topics such as geo-politics and what might alter global military dynamics are important issues but are outside the scope of NEPA and this EA.
Less than significant effects are not possible with increases in training.	The Navy provided objective, sound environmental analysis of the adverse effects of the Proposed Action based on the best available scientific data. All proposed training and testing activities at Barking Sands and Kaula Island would continue to be conducted in accordance with established SOPs, best management practices, and mitigation measures described in Table 3.4-1, Table 3.5-3, and Table 3.6-3. Therefore, although there may be an increase in tempo for some activities, the findings of this EA do not indicate any significant adverse effects would occur to the human or natural environment.
Utilizing current ongoing military training and testing activities as a baseline is not appropriate	For purposes of the EA, the affected environment or “baseline conditions” was established based on the environment as it exists today and includes the current state of the environment based on best available data (including natural and cultural resources survey data). These baseline conditions provide the context for evaluating the environmental consequences of the Proposed Action.

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	For purposes of the EA, using the status quo (baseline conditions) is an acceptable approach for the no action alternative. The no action alternative may be thought of in terms of continuing with the present course of action until that action is changed. In requiring consideration of a no action alternative, an agency may compare the potential impacts of the proposed major federal action to the known impacts of maintaining the status quo (or baseline conditions). The Navy has done just that in the EA.
Adverse effects should not be dismissed simply because the area is already degraded.	For purposes of the EA, the affected environment or "baseline conditions" was established based on the environment as it exists today and includes the current state of the environment based on best available data (including natural and cultural resources survey data). These baseline conditions provide the context for evaluating the environmental consequences of the Proposed Action.
The inappropriate compartmentalization of land and sea impacts.	The Proposed Action is of independent need and utility because it deals specifically with land-based training and testing activities at Barking Sands and Kaula Island. At-sea training and testing activities are a distinct action; to the extent land activities have in-water impacts, those effects were already considered in prior NEPA (1999 Enhanced Capability EIS, 2008 HRC EIS, 2013 Hawaii Southern California Training and Testing (HSTT) EIS/Overseas EIS (OEIS), and 2018 HSTT EIS/OEIS); ESA species and marine mammal impacts are captured in those applicable authorizations. In addition, future (2026–2032) at-sea training and testing requirements are being analyzed in a forthcoming separate document, anticipated in late 2025, in order to analyze updated training and testing requirements, incorporate best available science, and meet regulatory timelines specifically associated with Marine Mammal Protection Act and ESA permitting requirements. Furthermore, cumulative impacts of all past, present, and reasonably foreseeable direct and indirect effects including those for at-sea training and testing activities are analyzed in Chapter 4 of this EA.
Lease renewals and ownership of Kaula Island were not addressed in the Draft EA.	This Proposed Action is of independent need and utility and is a separate and distinct action not related to the PMRF and Kokee Park Geophysical Observatory Real Estate EIS. The Proposed Action for this EA specifically analyzes land-based training and testing activities conducted on lands under federal jurisdiction at Barking Sands and Kaula Island. The Navy has reviewed historical property records and determined that ownership of Kaula Island remains with the United States.
"Short term" or "temporary" does not avoid a determination of significant impact per Council on Environmental Quality guidelines.	The Navy provided objective, sound environmental analysis of the adverse effects of the proposed action based on the best available scientific data. Based on the analysis presented in this EA, the findings do not indicate any significant adverse effects would occur to the human or natural environment. As of April 11, 2025, Council on Environmental Quality guidance and regulations have been rescinded.

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The data used in the Draft EA analysis is out of date and difficult to access, and relying on the 1998 EIS is unacceptable.	The Navy has provided objective, sound environmental analysis based on the best available scientific data. The 1998 Enhanced Capability EIS provided the foundational analysis of this EA; additional updates and analysis were then provided in the 2008 HRC EIS. While this EA incorporates relevant data and analysis from the previous NEPA documents, the Navy also extensively researched sources of available data today, to include survey reports on Barking Sands and Kaula Island, updated PMRF Integrated Natural Resources Management Plan (INRMP), updated PMRF Integrated Cultural Resources Management Plan, and other information on known resources to inform the evaluation of impacts from the Proposed Action. Additionally, since the release of the Draft EA, the Navy has established a PMRF Land-Based Training EA website to increase accessibility to EA materials and ongoing updates (http://nepa.navy.mil/pmrflbttea). Table 1.6-1 in the Draft EA includes key documents from 1993 to 2023 which are sources of information that have been incorporated by reference in the Draft EA. In addition, other sources of data are referenced accordingly throughout the EA and included in the References chapter (Chapter 7) of the Draft EA. Lastly, aerial surveys of seabirds and marine mammals at Kaula Island have been made available at the U.S. Navy Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/reporting/pacific/). The Final EA has been updated based upon comments received on the Draft EA and a comprehensive summary of 13 seabird and marine mammal surveys conducted at Kaula Island has been added as an appendix to the EA (See Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023). During the 30-day public comment period the Draft EA was available for download on the following website (no paywall): https://pacific.navfac.navy.mil/About-Us/National-Environmental-Policy-Act-NEPA-Information. The Draft EA was also available in CD and hardcopy format at the public meeting on September 17, 2024, and at the Waimea Public Library and Lihue Public Library since September 3, 2024.
The comparison between ongoing and proposed activities in Table 2-1 is misleading; considering the lower numbers or averages could significantly alter the analysis of how increasing activities over the existing	Tables 2.1-1 and 2.1-3 include a list of training and testing activities and the number of ongoing and proposed annual activities. Table 2.1-1 also includes the location where training and testing activities are being conducted. The number of ongoing activities shown has been updated in the Final EA from the highest single-year activity occurrences and now represents the average over the period 2018–2023 for that type of activity. Therefore, the EA now analyzes the average number of training and

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baseline may affect the surrounding environment. Table 2-1.1	testing activities that have occurred over that timeframe (No Action Alternative or status quo) compared to the Proposed Action. The Navy has reviewed and incorporated the best available data to compile the environmental baseline and conduct the environmental analyses. Based on the analysis presented in this EA, the findings do not indicate any significant impacts would occur to the human or natural environment.
The increases in hazardous air pollutants (HAP) and greenhouse gas (GHG) emissions are significant to Kauai and that comparing increases in emissions from the Proposed Action to national and global emission levels is misleading.	HAP emissions are quantified for the Proposed Action and presented in tables in the air quality section. It should be noted that all emission calculations, including HAP emission calculations, conservatively assume that the proposed activities all occur within the same year at their highest average tempo and maximum number of personnel. Therefore, they overestimate the increase in emissions. For example, the increase in hourly HAP emissions were calculated assuming that all activities would occur within the same hour over the span of 13 days per year, which is the average duration of activities. In reality, the proposed activities may not all occur within the same year at the highest intensity and not all HAP emissions would occur within the same hour at the same location. Even with the overestimated emissions, due to the relatively low emission increase, the infrequent occurrence of emissions, and given the distance to downwind receptors, impacts to air quality and human health risks from HAP exposure are expected to be less than significant. The increase in GHG emissions, estimated as 7,753 metric tons of CO_2 equivalent per year, was also conservatively calculated assuming that all proposed activities would occur within the same year at their highest average tempo and maximum number of personnel. Since GHG emissions is a global issue, the increase in GHG was compared to the local, national, and global GHG emissions. As shown in Section 3.2.6.2 (Proposed Action), the increase in GHG emissions is approximately 0.03 percent of the 2019 GHG emissions reported for Kauai County. The analysis concluded that the increase in GHG emissions is relatively small; therefore, impacts would be less than significant as a result of implementation of the Proposed Action.
Considering Kaula Island uninhabited ignores the presence of wildlife and that the Proposed Action does not properly account for the degradation of a wildlife sanctuary.	Mention of Kaula Island as an “uninhabited” island has now been clarified in the Final EA to say Kaula Island is “uninhabited by humans.” Only non-explosive practice munitions would continue to be used on Kaula Island and training activities would only occur in the southernmost 11 acres of the island. No degradation of wildlife would occur because there are existing range requirements in place to protect wildlife. These include the following: (1) Activities shall not impact the waters around Kaula Island. (2) Before firing by any aircraft, pre-surveys are conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island, or if monk seals are on the ledges

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	around the southern inert ordnance impact area. If any of the above mentioned are determined to be present, no firing will take place until areas are cleared. Units cannot attempt to provoke clearing. (3) No aircraft are permitted to land on Kaula Island. (4) To avoid bird strike, aircraft are to remain above an altitude of 1,000 ft. (5) Units must immediately report inadvertent ordnance put into the water surrounding Kaula Island. (6) For a scheduled event, a LNM is published on the U.S. Coast Guard website (https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/) a minimum of five business days prior to an event at Kaula Island to close the surrounding sea space. In addition, all proposed activities on Kaula Island would be short in duration and occur within a regularly used established training site. Any displacement of wildlife as a result of activities conducted on Kaula Island would be temporary and short term. Wildlife species have occurred on Kaula Island for decades during current training activities, and no adverse effects have been observed (see Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023). Wildlife species continue to use the habitats of Kaula Island before, during, and after training activities. Established SOPs as described above would continue to be implemented to minimize impacts to wildlife. As such, impacts on wildlife would be less than significant.
Impacts on wildlife from training and testing has not been explicitly studied at Barking Sands and Kaula Island and new wildlife and noise surveys should be conducted.	At Barking Sands and Kaula Island, training and testing activities have been previously conducted for decades. Several wildlife surveys have and continue to be conducted at Barking Sands and Kaula Island. The EA uses the most recent surveys and best available data. As a result of a prior Coastal Zone Management Act (CZMA) consistency determination with the State of Hawaii, bi-annual avian and marine mammal surveys have been conducted at Kaula Island since 2008. The most recent surveys and data used for purposes of analysis are included in Section 3.5 (Terrestrial Biological Resources). Additionally, a comprehensive summary of the 13 seabird and marine mammal surveys that have been conducted at Kaula Island has been added as an appendix to the EA (See Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023). Details on surveys can also be found on the Navy's Marine Species Monitoring website at: https://www.navymarinespeciesmonitoring.us/reporting/pacific. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation and cultural understanding. Further, SOPs and mitigation measures have been developed in coordination with the USFWS as listed in Table 3.5-3 to avoid impacts to wildlife. These SOPs and mitigation measures would continue to be implemented as part of the Proposed Action.

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The evaluation for ESA species in the Draft EA was insufficient, and the Proposed Action violates the ESA and MBTA.	The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, or the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island. (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence). The outcome of the informal consultation is summarized in the Final EA. The U.S. Department of Defense (DoD), like other federal agencies, has regulatory, management, and stewardship responsibilities related to migratory birds. These requirements are driven by the MBTA, the "Military Readiness Rule" (50 CFR section 21.42, Authorization of take incidental to military readiness activities), and Executive Order (EO) 13186. Under the military readiness rule, the Navy may take migratory birds incidental to military readiness activities described in this EA provided that the Navy's actions do not result in a significant adverse effect on a population of birds protected under the MBTA. Barking Sands implements various management measures to avoid adverse effects to migrating birds and special status species, including seasonal and temporal operational limitations such as the Dark Skies program from September 15 to December 15, as well as night lighting protocols. Accordingly, the Navy has determined that the Proposed Action would not result in a significant adverse effect on a population of a migratory bird species. If over the course of training and testing activities, the Navy determines that a population of migratory birds would be significantly impacted, the Navy would be required to confer and cooperate with the USFWS to develop and implement appropriate conservation measures to minimize or mitigate such significant adverse effects. Based on the analysis contained in the EA, the Navy's proposed military readiness activities would not adversely impact any population of migratory bird species. Analysis determined that no significant adverse effect to MBTA-protected populations would occur under the Proposed Action (refer to Section 3.5.5, Environmental Consequences, of the EA). Additionally, the Navy met with the USFWS MBTA office in November 2024 to discuss the Proposed Action as it relates to migratory birds; the Final EA was updated in accordance with the outcome of that discussion.
The Draft EA did not thoroughly analyze impacts to seabirds or properly consider the detrimental	Best available data was used to evaluate startle responses to birds, including seabirds. The Navy has conducted regular wildlife surveys at Barking Sands and Kaula Island. Wildlife is managed at Barking Sands and Kaula Island per the 2022 INRMP. Monitoring, surveys, and other management procedures

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impacts that startle responses can have on seabirds or their nests.	are also required by Section 7 consultations outlined in Section 3.5 (Terrestrial Biological Resources) of the EA. As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual avian and marine mammal surveys have been conducted at Kaula Island since 2008; the surveys have been made available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. A comprehensive summary of the 13 surveys has been added as an appendix to the EA (see Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023). The EA analyzes noise-related impacts to birds (including seabirds) at Barking Sands from increased personnel and vehicles, launches, and artillery in Section 3.5.5.2.1 (Barking Sands). The analysis in this section concluded there would be less than significant impacts on seabirds under the Proposed Action at Barking Sands. For Kaula Island, the analysis in Section 3.5.5.2.2 (Kaula Island) analyzes potential noise impacts resulting in seabird startle responses and has been augmented to reflect additional information provided in public comments on the Draft EA. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation and cultural understanding. Surveys conducted between 1932 and 2023 indicate there has been consistent seabird populations on Kaula Island despite ongoing training exercises utilizing non-explosive practice munitions (Naval Facilities Engineering Systems Command Hawaii, 2023).
The Draft EA does not provide data to support the statement that seabird population composition or numbers have remained stable throughout sustained training and testing events.	The Navy has conducted regular wildlife surveys at Barking Sands and Kaula Island, the results of which demonstrate stable wildlife populations at PMRF. Wildlife is managed at Barking Sands and Kaula Island per the 2022 Integrated Natural Resources Management Plan. Monitoring, surveys, and other management procedures are also required by Section 7 consultations outlined in Section 3.5 (Terrestrial Biological Resources) of the EA. As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual avian and marine mammal surveys have been conducted at Kaula Island since 2008; the surveys have been made available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. A comprehensive summary of the 13 surveys has been added as an appendix to the EA (See Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023), and further detail on the surveys has been added to Section 3.5.5.2.2 (Kaula Island). Survey data was used to analyze potential impacts of training and testing activities on seabird populations. As documented in Section 3.5.5.2.2 (Kaula Island), aerial surveys conducted for Kaula Island reflect the fact that the seabird composition of the island has remained consistent over time

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	despite ongoing GUNEX and BOMBEX activities. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation.
The potential spread of invasive species was not adequately addressed.	The Navy continues to implement SOPs and mitigation measures at PMRF as listed in Table 3.5-3 for management of invasive species. These measures include preventing and managing the spread of invasive vegetation and associated species by actions such as washing down vehicles and equipment between locations.
Noise impacts should be assessed in relation to wildlife, specifically wildlife present on Kaula Island, not just people.	The analysis of impacts to wildlife, to include responses to noise, are discussed in Section 3.5 (Terrestrial Biological Resources) of the EA. The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, or the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island. (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence). Additional information on the informal consultation has been summarized in the Final EA. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation into the future.
Inert munitions and spent casings would litter Kaula Island and impact the surrounding environment.	The Navy complies with all applicable laws and regulations for military expended munitions and range clearance for the training and testing activities proposed within the Study Area. Only the southern end (8 percent) of the island is used for range-related activities and only inert non-explosive practice munitions are authorized for use on the range. Kaula Island supports critical sustainment training for Navy and Marine Corps; the island is a contingency location for Navy units and is strategically important for Army and Air Force as a primary site for additional capability for maritime-based and joint long-range fires rehearsals before a mobilization for a Pacific conflict. All training activities at Kaula Island are limited to inert practice munitions only. All records of ordnance expenditures are captured, recorded, and tracked by the Navy. Regular range clearance operations are not conducted on the range because physical access is limited due to difficult terrain and sea states around the island. Kaula Island is densely populated with several bird species year-round making it extremely hazardous for helicopter access. Because of extremely limited access, periodic usage, and use of only non-

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	explosive munitions, operational range clearance is not presently required or conducted at Kaula Island. Barking Sands and Kaula Island are evaluated as part of the Range Condition Assessment (RCA) under the Navy's Range Sustainment Environmental Program Assessment (RSEPA). Based on the last RCA (completed in 2019), a review team of environmental and operational range experts evaluated the history of range use; the types and quantities of munitions; range location; available environmental data; and applicable environmental regulatory requirements. The evaluation included spatial distribution of the munitions and the breakdown of munitions constituents. The information and data for the evaluation were derived from site visits (at Barking Sands), personnel interviews, archive search reports, and document reviews conducted in 2018. The review team's findings, based on these data, concluded that the range and training operations are in compliance with environmental laws and policies. There are no munitions constituents of concern migrating off the range.
Kaula Island needs to be cleared according to Resource Conservation and Recovery Act (RCRA) requirements and the Navy needs to maintain records of clearance and type of munitions dropped.	The Navy complies with all applicable laws and regulations for military expended munitions and range clearance for the training and testing activities proposed within the Study Area. Under the U.S. Environmental Protection Agency's (USEPA's) Military Munitions Rule (MMR), which serves as an extension of RCRA that specifically addresses the unique circumstances related to military munitions at operational DoD ranges, munitions used for their intended purpose on active range are not considered solid waste. Additionally, munitions expended on a military range need not be addressed or removed until the range is formally closed. The Navy maintains records of types of munitions used at Kaula Island.
Radiation threats and hazard surveys should be addressed in the EA.	As noted in Section 3.4.4.1.4 (Electromagnetic Radiation), electromagnetic radiation (EMR) zones around transmitter sites and tracking radars are designated at various locations on Barking Sands. As directed by Navy procedures, PMRF uses a combination of establishing safety zones and conducting sector blanking (no radiation) in occupied areas to avoid potential EMR exposure. To ensure exposure risks to personnel are minimal, the Navy conducts regular electromagnetic radiation hazard surveys every five years and before any modifications to a unit are made or when new radar equipment is installed. In addition, all radar units have red (radar unit is on) and blue (radar unit is emitting EMR) warning lights. EMR generated from radar units at Barking Sands do not expose the public to any hazardous radiation.
The location and contaminants addressed in public health and safety	Appendix A (Military Readiness Activity Descriptions) of the Draft EA describes the various types of ordnance to be used and location during training and testing under this Proposed Action. Appendix B

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should be disclosed and presented in a more accessible way.	(Air Quality Calculations) provides calculations regarding air quality emissions and contaminants associated with the Proposed Action. Appendix A (Military Readiness Activity Descriptions) of the Final EA has been updated to include the following information on munitions constituents and potential contaminants for GUNEX and BOMBEX activities. • The 20 millimeter (mm) cannon training practice projectiles are composed primarily of steel. • Non-explosive practice munitions consist of ammunition and components that contain no explosive material, and may include (1) ammunition and components that have had all explosive material removed and replaced with non-explosive material, (2) empty ammunition or components, and (3) ammunition or components that were manufactured with non-explosive material in place of all explosive material. These practice munitions vary in size from 25 to 500 pounds (lb.) and are designed to simulate the characteristics of explosive munitions for training and testing activities. Some non-explosive practice munitions may also contain unburned propellant (e.g., rockets), and some may contain spotting charges or signal cartridges for locating the point of impact (e.g., smoke charges for daylight spotting or flash charges for night spotting). • Large, non-explosive bombs—also called "practice" or "bomb dummy units"—are composed mainly of iron and steel casings filled with sand, concrete, or vermiculite. These materials are similar to those used to construct artificial reefs. • Non-explosive bombs are configured to have the same weight, size, center of gravity, and ballistics as explosive bombs. Practice bombs do not contain the explosive materials. All land-based training, and routine base operations and maintenance associated with the Proposed Action, would continue to be conducted in accordance with established military training and operating procedures and approved SOPs. Industry SOPs and other procedures would likely be implemented to minimize health and safety risks in accordance with Occupational Safety and Health Administration regulations. Based on the adherence to established procedures, increasing activity as described in the Proposed Action would not increase risk to public health and safety.
Request for a list of all munitions that the military wants to drop be published to verify there are no explosive or chemical hazards that	The training activities included in the Proposed Action would be a continuation of inert targeting exercises that have been conducted at Kaula Island for decades. No explosives would be used at Kaula Island under the Proposed Action. Barking Sands and Kaula Island are evaluated as part of the RCA under the Navy's RSEPA. Based on the last RCA (completed in 2019), a review team of environmental and operational range experts

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will harm people, wildlife, or the environment.	evaluated the history of range use; the types and quantities of munitions; range location; available environmental data; and applicable environmental regulatory requirements. The evaluation included spatial distribution of the munitions and the breakdown of the munition's constituents. The information and data for the evaluation were derived from site visits (at Barking Sands), personnel interviews, archive search reports, and document reviews conducted in 2018. The review team's findings, based on these data, concluded that the range and training operations are in compliance with environmental laws and policies. At Barking Sands, past risk assessments indicate that human receptors are limited to range users and level of risk is acceptable for all range users, and at Kaula Island, due to the small quantities of inert munitions used at Kaula Island on an annual basis and the low probability of exposure to human receptors, no further analysis was determined to be required to assess risk of off-range (outside of the 11-acre inert ordnance impact area) release of military constituents. There are no munitions constituents of concern migrating off of the range. Tables 2.1-1 and Table 2.1-3 in Chapter 2 (Description of Proposed Action and Alternatives at Barking Sands and Kaula Island) of the Final EA have been updated to include the types of munitions that could be used during each training and testing activity. Additionally, Appendix A (Military Readiness Activity Descriptions) has been updated to include the following information on munitions constituents and potential contaminants for GUNEX and BOMBEX activities. • The 20 mm cannon training practice projectiles are composed primarily of steel. • Non-explosive practice munitions consist of ammunition and components that contain no explosive material, and may include (1) ammunition and components that have had all explosive material removed and replaced with non-explosive material, (2) empty ammunition or components, and (3) ammunition or components that were manufactured with non-explosive material in place of all explosive material. These practice munitions vary in size from 25 to 500 lb. and are designed to simulate the characteristics of explosive munitions for training and testing activities. Some non-explosive practice munitions may also contain unburned propellant (e.g., rockets), and some may contain spotting charges or signal cartridges for locating the point of impact (e.g., smoke charges for daylight spotting or flash charges for night spotting). • Large, non-explosive bombs—also called "practice" or "bomb dummy units"—are composed mainly of iron and steel casings filled with sand, concrete, or vermiculite. These materials are similar to those used to construct artificial reefs.

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	• Non-explosive bombs are configured to have the same weight, size, center of gravity, and ballistics as explosive bombs. Practice bombs do not contain the explosive materials. Only non-explosive practice munitions would be used at Kaula Island (see Appendix A, Military Readiness Activity Descriptions, for descriptions of the activity and munitions [Sections A.1.10 and A.1.11] and photos [Figures A-15, A-16, and A-17]). Training and testing activities under the Proposed Action would continue to be conducted in compliance with all applicable laws and regulations concerning the impact of toxic materials in the environment, including the RCRA (42 U.S.C. Section 6921). It should be noted that under the USEPA's MMR, which serves as an extension of RCRA that specifically addresses the unique circumstances related to military munitions, munitions used for their intended purpose on active range are not considered solid waste.
The military training and testing activities at Barking Sands and Kaula Island would continue to pollute the Hawaiian land and waters and risk the health and safety of Native Hawaiians.	The U.S. Navy's Range Sustainment Program is designed to ensure that the Navy's training and testing ranges remain operational while protecting human health and the environment for nearby communities. Barking Sands and Kaula Island are evaluated as part of the RCA under the Navy's RSEPA program. Based on the last RCA (completed in 2019), a review team of environmental and operational range experts evaluated the history of range use; the types and quantities of munitions; range location; available environmental data; and applicable environmental regulatory requirements. The evaluation included spatial distribution of the munitions and the breakdown of the munition's constituents. The information and data for the evaluation were derived from site visits (at Barking Sands), personnel interviews, archive search reports, and document reviews conducted in 2018. The review team's findings, based on these data, concluded that the range and training operations are in compliance with environmental laws and policies. At Barking Sands, past risk assessments indicate that human receptors are limited to range users and level of risk is acceptable for all range users, and at Kaula Island, due to the small quantities of inert munitions used at Kaula Island on an annual basis and the low probability of exposure to human receptors, no further analysis was determined to be required to assess risk of off-range (outside of the 11-acre inert ordnance impact area) release of military constituents. There are no munitions constituents of concern migrating off of the range. In addition, training and testing activities under the Proposed Action would continue to be conducted in compliance with all applicable laws and regulations concerning the impact of toxic materials in the environment, including the RCRA (42 U.S.C. Section 6921). Under the USEPA's MMR, which serves as an extension of RCRA that specifically addresses the unique circumstances related to military munitions, munitions used for their intended purpose on an active range are not considered solid waste.

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	Section 3.4 (Public Health and Safety) has been updated to include additional details on evaluating range compliance. As discussed in Chapter 3 (Affected Environment and Environmental Consequences), implementation of the Proposed Action would result in less than significant impacts on resources analyzed. As a result, the Proposed Action would not significantly impact the long-term natural resource productivity of the area or permanently narrow the range of beneficial uses of the environment.
Wildfire risk was not adequately addressed.	The specific SOPs for managing wildfire risk at Barking Sands are included in Table 3.5-3 , and described in the correspondence from USFWS, located at subheader C.4.2 in Appendix C. As noted in Section 3.5.5.2.1 (Barking Sands), launch pads are kept clear of vegetation, and surrounding areas are maintained/landscaped. At Kaula Island, only non-explosive (inert) practice munitions are authorized. Although inert weapons lack ignition or explosive capabilities, their impact and potential ricochets can, on exceedingly rare occasions, generate sparks leading to vegetation fires. Nevertheless, potential vegetation impacts would be less than significant because the island's vegetation is very sparse, and gunnery and inert ordnance practice would continue to be confined to only 8 percent of the island. Brush fires from these activities are highly unlikely, and there have been no reports of fires from previous training activities. This is consistent with the analysis in the 2008 HRC EIS (U.S. Department of the Navy, 2008a).
The EA should include an environmental justice assessment, concern that there would be disproportionate effects from the Proposed Action on Native Hawaiians.	Environmental justice was addressed in Table 3.0-1 in the Draft EA; however, discussion of environmental justice has been removed from the Final EA based on the issuance of EO 14148 and EO 14173 on January 21, 2025.
The Draft EA fails to consider the impact on subsistence fishermen and traditional cultural practices, which is inconsistent with the recently promulgated Executive Order on Environmental Justice.	Environmental justice was addressed in Table 3.0-1 in the Draft EA; however, discussion of environmental justice has been removed from the Final EA based on the issuance of EO 14148 and EO 14173 on January 21, 2025. The Proposed Action includes land-based training and testing activities within the PMRF installation (Barking Sands) and Kaula Island in the existing southern inert ordnance impact area. The training and testing activities included in the Proposed Action would be a continuation of what has been conducted at Barking Sands and Kaula Island for decades.

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	Public access to Kaula Island has been and is currently restricted at all times due to dangerous and unsteady terrain and the possibility of unexploded ordnance (UXO) existing on the island. To minimize health and safety risks, a Danger Zone surrounding Kaula Island was established for the primary purpose of ensuring an adequate margin of safety to both personnel and equipment during inert bombing and gunnery training operations by the military. The Kaula Island Danger Zone is defined as the waters within a circular area with a radius of 4.8 kilometers (km) (3 miles [mi.]) centered on the island in which no person, vessel, or other craft shall enter or remain in any of the areas at any time except as authorized by the enforcing agency (33 CFR 334.1340). The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. The proposed revision would open the waters within a 3-nautical-mile radius of the island with restrictions only during active training activities. Under the revision, the waters surrounding Kaula Island would be open and available for cultural practices such as navigation and subsistence fishing, with the exception of when training activities are being conducted (see Section 3.4, Public Health and Safety, of the Final EA for details on the closure notification process). The Navy is exploring how the public would be notified if the danger zone were to be accessible for recreational activities outside of training event closures. Physical access to Kaula Island would continue to be restricted at all times. Section 3.4 (Public Health and Safety) of the Final EA has been revised to include SOPs implemented by the Navy prior to conducting activities at Kaula Island. Because the Proposed Action focuses on land-based training and testing activities, the Navy does not expect any of these activities to have a negative impact on subsistence fishing or other traditional cultural practices. The Navy acknowledges that munitions from past training exercises have been observed in the water surrounding Kaula Island; however, those munitions are historic and there has been no documentation of munitions falling in the water during training exercises at Kaula Island in recent decades. Inadvertent in-water impacts from training activities conducted at Kaula Island are not anticipated or reasonably foreseeable and therefore are not included in the Proposed Action or other at-sea NEPA documentation. All records of inert ordnance expenditures from GUNEX and BOMBEX activities at Kaula Island are captured, recorded, and tracked by the Navy. The Navy has required reporting of any misfire of ordnance at Kaula Island since 1978 (U.S. Department of the Navy, 1978). As far back as 2000, Navy has not had a reported misfire that landed in waters around the island or another part of the island outside the inert ordnance impact area. While some fishermen have reported seeing ordnance in waters around Kaula Island, such remnants are likely pre-dating historical data and current policies

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	since the early 2000s. Should inert munitions associated with the Proposed Action inadvertently land in the water surrounding Kaula Island, procedures established by the Navy, including the requirement for units to report year-round any incidents of ordnance expended in the waters surrounding the island to FACSFAC Pearl Harbor and other Navy commands, would be implemented. Additionally, Hawaiian traditional cultural practices on PMRF would continue to be managed in accordance with the SOPs described in Public Health and Safety (Table 3.4-1) and Cultural Resources (Table 3.6-2). Access to identified cultural resources at Barking Sands for traditional cultural practices would continue to be managed through written requests processed and approved by the PMRF Cultural Resources Manager. The Action Proponent would continue to provide Native Hawaiians with access to traditional religious and cultural properties in accordance with the American Indian Religious Freedom Act and EO 13007, *Indian Sacred Sites*, on a case-by-case basis.
Cumulative adverse impacts on Barking Sands and Kaula Island were ignored.	Cumulative impacts on the resources analyzed in the Draft EA were analyzed for past and reasonably foreseeable projects within five years of the preparation of this EA. Although the area of analysis may vary for each resource, the geographic extent for the cumulative impacts analysis includes Barking Sands and Kaula Island, while also generally factoring in relevant impacts in surrounding land areas and airspace outward from the boundaries of PMRF. For more information, reference Chapter 4 (Cumulative Impacts) of the Draft EA.
The Draft EA should consider the implementation of reasonable time-of-year restrictions on military activities at Kaula Island to minimize the harm to seabird species during peak nesting season.	Year-round access to Kaula Island is required to support evolving Navy training and testing requirements, which are linked to real world events. Only non-explosive practice munitions would be used on Kaula Island and training activities would only occur within the southernmost 11 acres of the island. To protect seabird species, no aircraft are permitted to land on Kaula Island and to avoid bird strike, aircraft are required to remain above an altitude of 1,000 ft. Wildlife is managed at Barking Sands and Kaula Island per the 2022 INRMP. Monitoring, surveys, and other management procedures are also required by Section 7 consultations outlined in Section 3.5 (Terrestrial Biological Resources) of the EA. As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual bird and marine mammal surveys have been conducted at Kaula Island since 2008; the surveys have been made available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. A comprehensive summary of the 13 surveys has been added as an appendix to the EA (See Appendix E, Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii from 2013 to 2023). Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation and cultural

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	understanding. Surveys conducted between 1932 and 2023 indicate there has been consistent seabird populations on Kaula Island despite ongoing training exercises utilizing non-explosive practice munitions (Naval Facilities Engineering Systems Command Hawaii, 2023). Additionally, due to the variety of bird species that are found on the island and their various breeding seasons, there is no specific "peak" breeding season that would lend itself to a time-of-year restriction. Therefore, implementation of any seasonal restrictions was considered not necessary. The Navy submitted a reinitiation of an informal consultation under the 2008/2021 HRC consultation to USFWS on October 4, 2024. On December 3, 2024, the USFWS provided concurrence with the Navy's determination that the Proposed Action may affect, but is not likely to adversely affect the Hawaiian goose (nene), Hawaiian duck, Hawaiian common gallinule, Hawaiian coot, Hawaiian stilt, Newell's shearwater, band-rumped storm petrel, Hawaiian petrel, Hawaiian hoary bat, green sea turtle, and *Panicum niihauense* and its designated habitat on Barking Sands, or the band-rumped storm petrel, Hawaiian petrel, Newell's shearwater, and *Portulaca villosa* on Kaula Island (U.S. Fish and Wildlife Service, 2024) (Appendix C, Agency Correspondence). The Final EA has been updated to reflect the outcome of this consultation. Additionally, the Navy met with the USFWS MBTA office in November 2024 to discuss the Proposed Action as it relates to migratory birds; the Final EA was updated in accordance with the outcome of that discussion. Training activities under the Proposed Action have been conducted at Kaula Island for decades, and the type of training activities would not change. Based on the analysis presented in the Biological Resources Section 3.5.5.2.2 (Kaula Island), impacts on wildlife are anticipated to be less than significant and no long-term impacts would occur on the seabird population on Kaula Island.
Kaula Island is a sacred site that people are genealogically connected to within the Native Hawaiian culture, and the Proposed Action would be desecrating a spiritually significant place.	The Navy is committed to protecting the environment during the conduct of its training and testing activities. An archaeological survey was completed across all accessible terrain on Kaula by Robins & L. Anderson in 2001. Excluding the steep cliffs and eroding slopes encircling the island, and areas inaccessible due to high winds and ground surface instability, archaeologists surveyed approximately 36 acres or 50 percent of the accessible surface of the island. Six archaeological sites were recorded on Kaula Island. No archaeological sites were identified within the training area on the southern portion of the island. For this Proposed Action, the Navy is meeting the responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region

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	Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (U.S. Department of the Navy, 2012c). During the public commenting period of the Draft EA in September 2024, the Navy received comments from members of the Native Hawaiian community, NHOs, OHA, and the public expressing concerns about continued use of Kaula Island by the military for training activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kuhaimoana, the Shark God who lives in a large underwater cave known as Keanaoku. NHOs also recognize the island as a traditional place used by Native Hawaiians for collecting natural resources, including bird feathers and stones used in traditional octopus lures. Additionally, comments indicated that cultural practices, such as navigation and subsistence fishing, are conducted in the vicinity of Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. The Navy shared information about prior surveys of Kaula Island, conducted additional information gathering and research, and engaged with NHOs regarding traditional knowledge and cultural practices pertaining to Kaula Island. Subsequently, the Navy determined that Kaula Island meets the criteria of a TCP eligible for listing in the NRHP. Three character-defining features were identified within the Kaula Island TCP: Kaula Island itself; the sea cave Keanaoku; and Kahalauloa, the location of a sacred Hawaiian temple (heiau). See Section 3.6 (Cultural Resources) for additional information on the TCP. In accordance with Section IX of the 2012 PA, the Navy determined the proposed undertaking would adversely affect the Kaula Island TCP. This adverse effect stems from (1) introducing visual and atmospheric elements that diminish the integrity of its setting and feeling, and (2) further limiting NHO access. Potential effects on the sea cave and heiau are avoided as these features are on the island's northern side, well outside the proposed training area, and no new areas or types of training activities are included in the proposed undertaking. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties, and notified the ACHP, in an effort to resolve adverse effects on the Kaula Island TCP and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island) of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence).

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Lack of consultation with NHOs or Native Hawaiian cultural practitioners in accordance with Section 106 of the NHPA.	For this Proposed Action, the Navy is meeting the responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii. The 2012 PA is an established Section 106 program alternative that provides a framework for professional review and assessments of effects, responses to post-review discoveries and emergencies, periodic reporting, and processes for participation by NHO and consulting parties. In accordance with the 2012 PA, all training and testing activities at Barking Sands would be reviewed in advance by qualified subject matter experts to confirm the effectiveness of measures to avoid and minimize harm to historic properties. At SHPD's request, Commander, Navy Region Hawaii will commit to quarterly reporting of activities reviewed under Stipulation XII in the PA, in addition to the annual report. During the public commenting period of the Draft EA, the Navy received comments from members of the Native Hawaiian community, NHOs, and the public expressing concerns about continued use of Kaula Island by the military for training activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kuhaimoana, the Shark God who lives in a large underwater cave known as Keanaoku. NHOs also recognize the island as a traditional place used by Native Hawaiians for collecting natural resources, including bird feathers and stones used in traditional octopus lures. Additionally, comments indicated that cultural practices, such as navigation and subsistence fishing, are conducted in the vicinity of Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. The Navy shared information about prior surveys of Kaula Island, conducted additional information gathering and research, and engaged with NHOs regarding traditional knowledge and cultural practices pertaining to Kaula Island. Subsequently, the Navy determined that Kaula Island meets the criteria of a TCP eligible for listing in the NRHP. Three character-defining features were identified within the Kaula Island TCP: Kaula Island itself; the sea cave Keanaoku; and Kahalauloa, the location of a sacred Hawaiian temple (heiau). See Section 3.6 (Cultural Resources) for additional information on the TCP. In accordance with Section IX of the 2012 PA, the Navy determined the proposed undertaking would adversely affect the Kaula Island TCP. This adverse effect stems from (1) introducing visual and

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	atmospheric elements that diminish the integrity of its setting and feeling, and (2) further limiting NHO access. Potential effects on the sea cave and heiau are avoided as these features are on the island's northern side, well outside the proposed training area, and no new areas or types of training activities are included in the proposed undertaking. The Navy has initiated consultation with NHOs, SHPD, OHA, and other consulting parties, and notified the ACHP, in an effort to resolve adverse effects to the Kaula Island TCP and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island) of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence).
Sacred sites on Barking Sands and Kaula Island are inaccessible due to military presence.	For this Proposed Action, the Navy is meeting the responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (U.S. Department of the Navy, 2012c). Hawaiian traditional cultural practices on PMRF would continue to be managed in accordance with the SOPs described in Public Health and Safety (Table 3.4-1) and Cultural Resources (Table 3.6-2). Access to identified cultural resources within Barking Sands would continue to be managed through written requests processed and approved by the PMRF Command. PMRF installation personnel would continue to provide Native Hawaiians, and others with an interest, access to culturally significant sites at Barking Sands. Public access to Kaula Island is restricted at all times due to dangerous and unsteady terrain and the possibility of UXO existing on the island. Additionally, large populations of seabirds preclude the landing of aircraft on the island, and there are no beaches for vessels to land on outside of high surf zones. To minimize health and safety risks, a Danger Zone surrounding Kaula Island was established for the primary purpose of ensuring an adequate margin of safety to both personnel and equipment during inert bombing and gunnery training operations by the military. The Kaula Island Danger Zone is defined as the waters within a circular area with a radius of 4.8 km (3 mi.) centered on the island in which no person, vessel, or other craft shall enter or remain in any of the areas at any time except as authorized by the enforcing agency (33 CFR 334.1340). The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. Under the revision, the waters within a 3-nautical-mile (NM) radius would be open and available for cultural practices such as navigation and subsistence fishing, except when training events are being conducted

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	(see Section 3.4, Public Health and Safety, of the Final EA for details on the closure notification process). The Navy is exploring how the public would be notified if the danger zone were to be accessible for recreational activities outside of training event closures. Physical access to Kaula Island would continue to be restricted at all times. Section 3.4 (Public Health and Safety) of the Final EA has been revised to include SOPs implemented by the Navy prior to conducted activities at Kaula Island.
The public was not provided adequate notice that the draft EA was available for public review and comment, a hard copy of the EA wasn't available in public libraries, and electronic copy of the draft EA was behind a paywall.	A NOA of the Draft EA and public comment period was published on August 30, 2024. The NOA was published in The Garden Island and the Honolulu Star Advertiser newspapers (between August 30, 2024, and September 4, 2024). The newspaper advertisements included information about the availability of the Draft EA for review and comment, public involvement opportunities, and the open-house public meeting. On September 12, 2024, the PMRF Public Affairs Officer distributed a news release with information about the public meeting, scheduled for September 17, 2024, to local media outlets. A public meeting was held on September 17, 2024, at the Kauai Veterans Center in Lihue. During the 30-day public comment period, the Draft EA was available for download on the following website (no paywall): https://pacific.navfac.navy.mil/About-Us/National-Environmental-Policy-Act-NEPA-Information. The Draft EA was also available in CD and hardcopy format at the public meeting on September 17, 2024, and at the Waimea Public Library and Lihue Public Library since September 3, 2024. Additionally, the public was able to submit comments to three email addresses, PMRF.LBY.EA.Comments@us.navy.mil, PMRF-LBT-EA-Comments@us.navy.mil and CPF-Environmental-PA@us.navy.mil, during the 30-day Draft EA public review and comment period. Email was monitored by Navy staff, and comments were compiled and submitted to project team members frequently. The Navy received a total of 1,889 comment letters, form letters, and emails from agencies, organizations, elected officials and the public. Additionally, since the release of the Draft EA, the Navy has established a PMRF Land-Based Training EA website to increase accessibility to EA materials and ongoing updates (http://nepa.navy.mil/pmrflbttea).
Native Hawaiians are not being heard and the Navy is being a poor steward of the land.	The Navy is listening to the public and is appreciative of the 1,889 comments that came in during the comment period. The Navy has taken those comments earnestly as it has refined analysis and

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	considered the purpose, need, and alternatives and ways to mitigate any reasonably foreseeable impacts. The Navy is committed to protecting the environment during the conduct of its training and testing activities. As described in the EA, the Navy has implemented SOPs, conservation measures, and mitigation measures to protect the marine environment while training and testing. The Navy and PMRF installation personnel take environmental stewardship seriously and have robust SOPs and conservation measures that are implemented for each training and testing event. At PMRF this includes, but is not limited to, trainee briefings on the natural and cultural sensitivity of the base prior to activities, and onsite monitoring for cultural and natural resources during applicable training and testing activities and seasonal and temporal operational limitations (associated with the Dark Skies program that runs every year from September 15 to December 15), in an effort to avoid adverse effects on the environment. At Kaula Island, only non-explosive practice munitions would continue to be used be used and training activities would only occur in the southernmost 11 acres of the island. No degradation of wildlife would occur because there are existing range regulations in place to protect wildlife. These include the following: (1) Activities shall not impact the waters around Kaula Island. (2) Before firing by any aircraft, pre-surveys are conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island, or if monk seals are on the ledges around the southern inert ordnance impact area. If any of the above mentioned are determined to be present, no firing will take place until areas are cleared. Units cannot attempt to provoke clearing. (3) No aircraft are permitted to land on Kaula Island. (4) To avoid bird strike, aircraft are to remain above an altitude of 1,000 ft. (5) Units must immediately report inadvertent ordnance put in waters. (6) For a scheduled event, a LNM is published on the U.S. Coast Guard website (https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/) a minimum of 5 business days prior to an event at Kaula Island to close the surrounding sea space. The durations of closures vary and are dependent on the activity being conducted. Additionally, a NOTAM is issued by the Federal Aviation Administration. In addition, the Navy has conducted regular wildlife surveys at Barking Sands and Kaula Island. Wildlife is managed at Barking Sands and Kaula Island per the 2022 Integrated Natural Resources Management Plan. Monitoring, surveys, and other management procedures are also required by section 7 consultations outlined in Section 3.5 (Terrestrial Biological Resources) of the EA. As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual bird and marine mammal surveys have been conducted at Kaula Island since 2008; the surveys have been made available at

Comment Topic	Navy Response
	https://www.navymarinespeciesmonitoring.us/reporting/pacific/. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation and cultural understanding.
Bombing Kaula Island would be a departure from PMRF's respected role in the west side community of Kauai.	The Navy is listening to the public and is appreciative of the robust comments that came in during the comment period. The Navy has taken those comments seriously as it has refined analysis and considered the purpose, need, and alternatives. GUNEX and BOMBEX activities at Kaula Island would only be conducted within the southernmost 11 acres of Kaula Island, which has served as a training range for decades. These activities would only use non-explosive practice munitions, as has been the practice since at least 1981. The Navy is committed to protecting the environment during the conduct of its training and testing activities. As described in the EA, the Navy has implemented SOPs, conservation measures, and mitigation measures to protect the marine environment while training and testing. For training activities at Kaula Island, only non-explosive practice munitions would continue to be used be used and activities would only occur in the southernmost 11 acres of the island. No degradation of wildlife would occur because there are existing range regulations in place to protect wildlife. These include the following: (1) Activities shall not impact the waters around Kaula Island. (2) Before firing by any aircraft, pre-surveys are conducted to determine if boats, people, or marine mammals are in the surrounding water or vicinity of the island, or if monk seals are on the ledges around the southern inert ordnance impact area. If any of the above mentioned are determined to be present, no firing will take place until areas are cleared. Units cannot attempt to provoke clearing. (3) No aircraft are permitted to land on Kaula Island. (4) To avoid bird strike, aircraft are to remain above an altitude of 1,000 ft. (5) Units must immediately report inadvertent ordnance put in waters. (6) For a scheduled event, a LNM is published on the U.S. Coast Guard website (https://www.dco.uscg.mil/Featured-Content/Mariners/Local-Notice-to-Mariners-LNMs/) a minimum of five business days prior to an event at Kaula Island to close the surrounding sea space. The durations of closures vary and are dependent on the activity being conducted. Additionally, a NOTAM is issued by the Federal Aviation Administration. The Navy and PMRF installation personnel take environmental stewardship seriously and have robust SOPs and conservation measures that are implemented for each training and testing event. At PMRF this includes, but is not limited to, trainee briefings on the natural and cultural sensitivity of the base prior to activities, and onsite monitoring for cultural and natural resources during applicable training and testing activities in an effort to avoid adverse effects on the environment. In addition, the Navy has conducted regular wildlife surveys at Barking Sands and Kaula Island. Wildlife is managed at Barking

Comment Topic	Navy Response
	Sands and Kaula Island per the 2022 INRMP. Monitoring, surveys, and other management procedures are also required by section 7 consultations outlined in Section 3.5 (Terrestrial Biological Resources) of the EA. As a result of a prior CZMA consistency determination with the State of Hawaii, bi-annual avian and marine mammal surveys have been conducted at Kaula Island since 2008; the surveys have been made available at https://www.navymarinespeciesmonitoring.us/reporting/pacific/. Upcoming acoustic avian and drone studies at Kaula Island will also further inform species conservation and cultural understanding. In response to public comments received on the Draft EA, and in accordance with the 2012 PA, since November 2024 the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. Subsequently, the Navy determined that Kaula Island meets the criteria of a TCP eligible for listing in the NRHP (see Section 3.6, Cultural Resources, for additional information). In accordance with Section IX of the 2012 PA, the Navy determined the proposed undertaking would adversely affect the Kaula Island TCP. This adverse effect stems from (1) introducing visual and atmospheric elements that diminish the integrity of its setting and feeling, and (2) further limiting NHO access. Potential effects on the sea cave and heiau are avoided as these features are on the island's northern side, well outside the proposed training area, and no new areas or types of training activities are included in the proposed undertaking. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties, and notified the ACHP, in an effort to resolve adverse effects on the Kaula Island TCP and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island) of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence).
Request for better communication with the Hawaiian community going forward.	The Navy is committed to maintaining open communication and meaningful dialogue with all communities to ensure public awareness and involvement. Commander, Navy Region Hawaii and Pacific Missile Range Facility established a PMRF Kauai Outreach Program in August 2023. The goals of the Outreach Program are to better communicate with and inform Kauai communities about PMRF and its role in national defense, the Navy's stewardship efforts to protect natural and cultural resources within its care, and its role as a good neighbor and community partner. The Navy set up a website (http://pmrfkauai.com) and is disseminating quarterly newsletters to make it easier for the community to find information on ongoing and upcoming environmental impact analyses,

Comment Topic	Navy Response
	community events, and updates related to military testing and training activities. Additionally, since the release of the Draft EA, the Navy has established a PMRF Land-Based Training EA website to increase accessibility to EA materials and ongoing updates (http://nepa.navy.mil/pmrflbttea). A NOA of the Draft EA and public comment period was published on August 30, 2024. The NOA was published in the Garden Island and the Honolulu Star Advertiser newspapers (between August 30, 2024, and September 4, 2024). The newspaper advertisements included information about the availability of the Draft EA for review and comment, public involvement opportunities, and the open-house public meeting. On September 12, 2024, the PMRF Public Affairs Officer distributed a news release with information about the public meeting, scheduled for September 17, 2024, to local media outlets. A public meeting was held on September 17, 2024, at the Kauai Veterans Center in Lihue. During the 30-day public comment period, the Draft EA was available for download on the following website (no paywall): https://pacific.navfac.navy.mil/About-Us/National-Environmental-Policy-Act-NEPA-Information. The Draft EA was also available in CD and hardcopy format at the public meeting on September 17, 2024, and at the Waimea Public Library and Lihue Public Library since September 3, 2024. Additionally, the public could submit comments to three email addresses, PMRF-LBT-EA-Comments@us.navy.mil, PMRF.LBY.EA.Comments@us.navy.mil, and CPF-Environmental-PA@us.navy.mil, during the 30-day Draft EA public review and comment period. Email was monitored by Navy staff, and comments were compiled and submitted to project team members frequently. The Navy received a total of 1,889 comment letters, form letters, and emails from agencies, organizations, elected officials, and the public. During the public commenting period of the Draft EA, the Navy received comments from members of the Native Hawaiian community, NHOs, and the public expressing concerns about continued use of Kaula Island by the military for training activities associated with the undertaking. Commenters indicated Native Hawaiians view the island as religiously and culturally significant for its association with Kuhaimoana, the Shark God who lives in a large underwater cave known as Keanaoku. NHOs also recognize the island as a traditional place used by Native Hawaiians for collecting natural resources, including bird feathers and stone used in traditional octopus lures. Additionally, comments indicated that cultural practices, such as navigation and subsistence fishing, are conducted in the vicinity of Kaula Island. Since November 2024, the Navy has conducted multiple meetings with NHOs, the OHA, SHPD, and other interested parties to identify historic properties and gather information regarding the historic and cultural significance of Kaula Island. The Navy shared information about prior surveys of Kaula

Comment Topic	Navy Response
	Island, conducted additional information gathering and research, and engaged with NHOs regarding traditional knowledge and cultural practices pertaining to Kaula Island. Subsequently, the Navy determined that Kaula Island meets the criteria of a TCP eligible for listing in the NRHP. In accordance with Section IX of the 2012 PA, the Navy determined the proposed undertaking would adversely affect the Kaula Island TCP. This adverse effect stems from (1) introducing visual and atmospheric elements that diminish the integrity of its setting and feeling, and (2) further limiting NHO access. Potential effects on the sea cave and heiau are avoided as these features are on the island's northern side, well outside the proposed training area, and no new areas or types of training activities are included in the proposed undertaking. The Navy has initiated consultation with NHOs, OHA, SHPD, and other consulting parties, and notified the ACHP, in an effort to resolve adverse effects on the Kaula Island TCP and develop a MOA in accordance with Stipulation IX.C.1 of the 2012 PA and 36 CFR section 800.6. Additional information is included in Sections 3.6.4.1.2 (Kaula Island) and 3.6.5.2.2 (Kaula Island) of the Cultural Resources chapter of the Final EA (Kaula Island), as well as Appendix C (Agency Correspondence).
The Proposed Action could negatively affect commercial fisheries and recreational opportunities at Barking Sands and Kaula Island.	The Proposed Action includes land-based training and testing activities only within the existing Barking Sands and Kaula Island footprint. The training and testing activities included in the Proposed Action would be a continuation of what has been conducted at Barking Sands and Kaula Island for decades. Because the Proposed Action focuses on land-based training and testing activities, the Navy does not expect any of these activities to have a negative impact on commercial fishing or recreational opportunities. Any at-sea components associated with activities are a distinct action and have been analyzed in the 2018 HSTT EIS/OEIS and the 2024 Hawaii-California Training and Testing (HCTT) Draft EIS/OEIS. To minimize health and safety risks, a Danger Zone surrounding Kaula Island was established for the primary purpose of ensuring an adequate margin of safety to both personnel and equipment during inert bombing and gunnery training operations by the military. The Kaula Island Danger Zone is defined as the waters within a circular area with a radius of 4.8 km (3 mi.) centered on the island in which no person, vessel, or other craft shall enter or remain in any of the areas at any time except as authorized by the enforcing agency (33 CFR 334.1340). The Navy is currently coordinating with the U.S. Army Corps of Engineers and the U.S. Coast Guard to revise the Danger Zone around Kaula Island. The proposed revision would open the waters within a 3 NM radius of the island with restrictions only during active training activities. Under the revision, the waters surrounding Kaula Island would be open and available for commercial fishing and water-based recreational activities, with the exception

Comment Topic	Navy Response
	of when training activities are being conducted (see Section 3.4, Public Health and Safety, of the Final EA for details on the closure notification process). The Navy is exploring how the public would be notified if the danger zone were to be accessible for recreational activities outside of training event closures. Physical access to Kaula Island would continue to be restricted at all times. Section 3.4 (Public Health and Safety) of the Final EA has been revised to include SOPs implemented by the Navy prior to conducted activities at Kaula Island.
There will be increases in population from Proposed Action.	While there could be an increase in training and testing activities at Barking Sands and Kaula Island, permanent stationing of servicemembers or civilians at PMRF is not included as part of the Proposed Action. Servicemembers and civilians would only be onsite at PMRF for the duration of the training or testing events.
The Draft EA is out of compliance with Hawaii Environmental Policy Act (HEPA) and other state requirements, NEPA, and NHPA requirements.	The Navy complies with all applicable environmental laws. Training at Barking Sands and Kaula Island would occur on lands under federal jurisdiction; thus, HEPA does not apply. Refer to Chapter 5 (Other Considerations Required by NEPA) of the EA for the status of compliance with federal, state, regional, and local plans, policies, or legal requirements considered during the preparation of this EA. For this Proposed Action, the Navy is meeting the responsibilities pursuant to Section 106 of the NHPA for the subject undertaking in accordance with the 2012 PA among the Commander Navy Region Hawaii, the Advisory Council on Historic Preservation, and the Hawaii State Historic Preservation Officer Regarding Navy Undertakings in Hawaii (U.S. Department of the Navy, 2012c).
Support for training on Kaula Island to maintain Navy capabilities and the widespread availability for public commenting on the Draft EA.	These comments are included as part of the official project record.

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Appendix E: Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023

Environmental Assessment

Pacific Missile Range Facility

Land-Based Training and Testing

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APPENDIX E Summary of Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii, from 2013 to 2023

E.1 Background

Surveys were carried out to meet the aims and objectives of the work required by the U.S. Navy to monitor the status of the seabird populations on Kaula Island (U.S. Department of the Navy, 2009). The Navy seeks to improve and build upon the seabird data gathering efforts by using higher altitude, very high-resolution aerial imaging surveys. As such, APEM and Normandeau were contracted by the U.S. Navy to provide ornithological data for the Pacific Island of Kaula Island, Hawaii, through the capture and analysis of digital high resolution aerial imagery.

Kaula Island is a small (0.64 square kilometers [km^2]), uninhabited by humans, crescent-shaped islet in the western chain of islands that make up the Hawaiian Archipelago (Figure E-1). The islands closest to Kaula are Niihau, located 37 km to the northeast, and Kauai, approximately 111 km to the northeast. A crater rim runs along the length of Kaula Island (approximately 1,676 m), which at its highest point is 164.6 m above sea level (Palmer, 1936). The terrain drops steeply from the ridge crest at a mean slope of 36°, and steep V-shaped ravines have been cut by ephemeral streams on the windward slopes such that the island has little level terrain (Elmer J. S. & Swedberg, 1971) (Figure E-2). The northern horn of the island extends 762 m from the summit and ends at an elevation of approximately 85 m, while the southern horn extends 914 m from the summit and ends at an elevation of approximately 30 m (Palmer, 1936).

Since 1952, the U.S. Navy has used the southeastern tip of the island (approximately 0.06 km^2) as a range to train aviators in air-to-surface and surface-to-surface weapons delivery. Both live and inert ordnance were used during training missions through 1980. Since 1981, munitions training by the Navy at Kaula has been restricted to inert ordnance delivery and aircraft gunnery (U.S. Department of the Navy, 2008, 2013).

Historically, 11 land-based avian surveys were undertaken on the island between 1932 and 1998, but due to safety reasons, land-based surveys were halted (Pepi et al., 2009; Richie & J. Fujimoto, 2011). Four boat-based avian surveys were conducted at Kaula Island from 2009 to 2012 but were not successful in obtaining a representative count of birds sitting atop the island. A summary of the findings of the land-based and boat-based surveys at Kaula Island are presented in Table E-13. Aerial digital surveys commenced in April 2013; 11 surveys have been conducted to date.

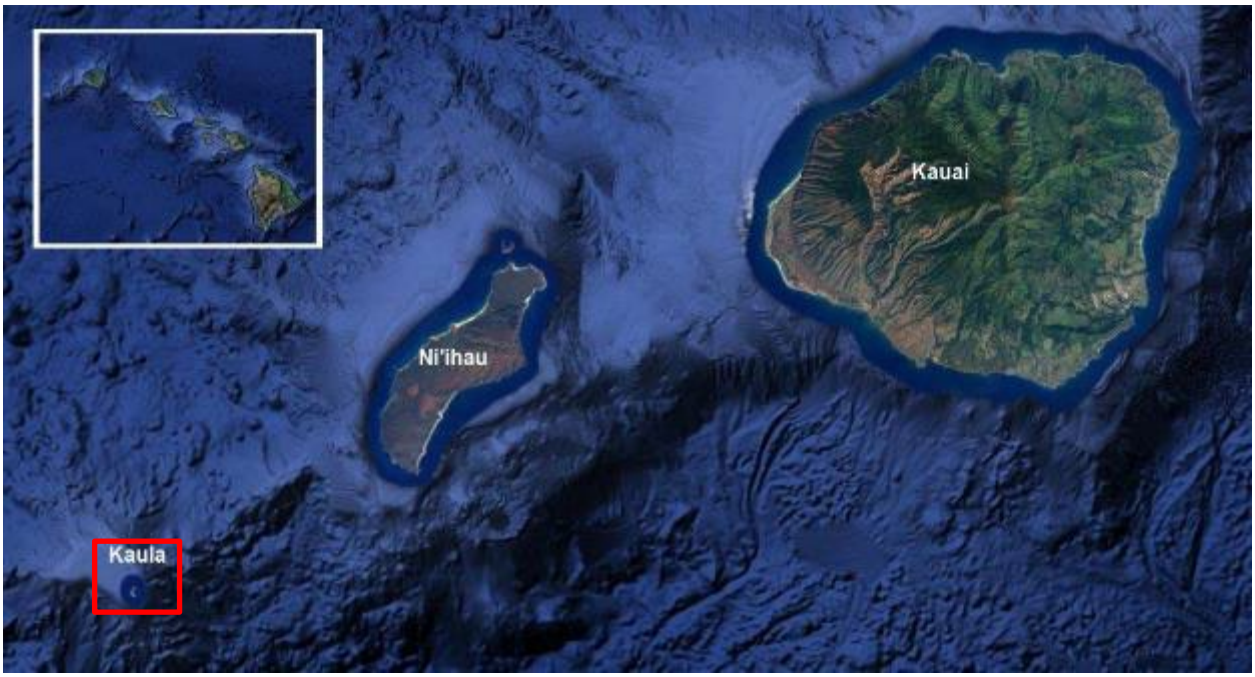


Figure E-1: Location of Kaula Island Relative to the Main Hawaiian Islands, and Kauai and Niihau



Figure E-2: Topography of Kaula Island (Photo Taken July 17, 2017, from the northeast)

E.2 Survey Design and Methodology

For each of the 13 aerial surveys conducted from 2013 to 2023, high-resolution digital still images were collected using survey aircraft and a GPS-linked custom flight management camera system, the APEM SeeBird01, specifically designed by APEM to target high resolution surveys for birds and marine mammals. Survey photographs were taken over approximately a two-hour period. These technological improvements used in the aerial surveys resulted in the following developments in data collection on Kaula Island:

- Increased count accuracy through post-hoc, quantitative analysis of imagery rather than near-instantaneous live counts by observers in the field.
- Increased count accuracy through elimination of bird disturbance effects from low-flying helicopters.
- Increased count accuracy and bird identification ability on Kaula Island (previously surveyed by boat) because of increased visibility of the higher sections and slopes of the island.

Due to the wide range of topographical features on Kaula, surveys were carried out at various altitudes and angles to ensure that high quality imagery was achieved over the whole island (100 percent coverage), including capturing animals on horizontal as well as vertical ledges. This was accomplished by a vertical survey of Kaula Island at higher altitude, a vertical survey at a low altitude, and oblique images (oblique survey) of birds on steep overhanging cliff faces that may not have been visible from the vertical surveys.

Images with the highest resolution for each location on the island were used to compile an image mosaic, and any overlapping image sections were removed[1]. The mosaic images were then split into 296 grid cells. APEM staff recorded the following information from each grid cell:

- bird/mammal species by common name (see Table E-1 for scientific names);
- behavior (e.g. sitting, flying, diving or on occupied nest);
- count (number of individuals);
- position (easting, northing) of individuals; and
- date and time stamp of image collection.

APEM's Graphical User Interface software was used to detect all individuals within each grid cell; analysts then confirmed the software's findings and identified the species of the individuals based upon the size, shape and visible characteristics present in the images. The resolution of the images is extremely high, such that species can be identified with a high degree of certainty. All images containing birds and marine mammals were processed in each grid cell and then checked by APEM's quality assurance manager. The quality assurance manager, an experienced ornithologist, is responsible for maintaining and updating the image library and provides advice and guidance to the image processing staff.

[1] The risk of double counting individuals due to transect overlaps or undercounting individuals due to transect gaps were considered to be present but equally small, and thus the effect on the population count was considered negligible.

E.3 Survey Summaries and Findings

A total of 27 avian species and 2 marine mammal species have been observed during the aerial surveys conducted at Kaula Island from 1932 through 2023. The common and scientific names of avian and marine mammal species observed at Kaula Island from all surveys (1932–2023) are listed in Table E-1.

Table E-1: Common and Scientific Names of Bird and Marine Mammal Species Observed in the Surveys at Kaula Island (1932–2023)

Common Name	*Scientific Name*
Laysan albatross	*Phoebastria immutabilis*
Black-footed albatross	*Phoebastria nigripes*
Bonin petrel	*Pterodroma hypoleuca*
Bulwer's petrel	*Bulweria bulwerii*
Wedge-tailed shearwater	*Puffinus pacificus*
Christmas shearwater	*Puffinus nativitatis*
White-tailed tropicbird	*Phaethon lepturus*
Red-tailed tropicbird	*Phaethon rubricauda*
Great frigatebird	*Fregata minor*
Masked booby	*Sula dactylatra*
Brown booby	*Sula leucogaster*
Red-footed booby	*Sula sula*
Masked/red-footed booby	*Sula dactylatra/S. sula*
Pacific golden plover	*Pluvialis fulva*
Wandering tattler	*Heteroscelus incanus*
Ruddy turnstone	*Arenaria interpres*
Brown noddy	*Anous stolidus*
Black noddy	*Anous minutus*
Brown/black noddy	*Anous species*
Blue-grey noddy	*Procelsterna cerulea*
White tern	*Gygis alba*
Sooty tern	*Onychoprion fuscatus*
Grey-backed tern	*Onychoprion lunatus*
Barn owl*	*Tyto alba*
Japanese white-eye*	*Zosterops japonicus*
Northern mockingbird*	*Mimus polyglottos*
Northern cardinal*	*Cardinalis cardinalis*
Hawaiian monk seal	*Neomonachus schauinslandi*
Humpback whale	*Megaptera novaeangliae*

** indicates a non-native species to Hawaii.*

None of these species are federally listed as threatened or endangered; however, 25 of the 27 are protected by the Migratory Bird Treaty Act (MBTA). The U.S. Fish and Wildlife Service considers 3 of these 25 MBTA-protected species to be Birds of Conservation Concern (Laysan albatross, black-footed albatross, and gray-backed tern). Given the varied breeding cycles of all the seabirds that utilize Kaula, the timing of aerial surveys since 2013 was purposefully diversified in order to detect as many species as possible. In general, more birds (in both numbers and species) were present on Kaula in the summer months, which is to be expected considering more species, including the relatively abundant sooty tern,

typically breed in the summer. Beyond a general increase in bird numbers in summer months, the results of these surveys for both individual bird numbers and species presence showed high variation, likely due to two factors: methodology and timing.

Methodology: The least accurate survey method was the boat-based binocular surveys. This was due to limited vantage points and difficulty in counting accurately while on a moving vessel. The land-based surveys were presumably reliable, allowing biologists to search directly from different vantage points while physically on the island. However, some inherent limitations exist with multiple observers deployed over some length of time, covering the island on foot while birds are moving around. Undoubtedly, some birds were missed or double-counted and, in densely populated areas, observers were likely forced to estimate the number of individual birds present. The aerial imagery surveys might be the most accurate, given the high resolution of the images and the snapshot in time that they represent. Every individual bird capture on the images is counted and identified to species. One potential limitation of this method is non-detection of burrow nesting seabirds if they were present and happen to be in an underground burrow at the time images were captured.

Timing: The time of year when these surveys were conducted also influenced the results. Different seabird species are present on Kaula at different times of the year, based on when they come to the island to breed. Thus, the species composition typically varies with the seasons, making inter-year comparisons of data from surveys conducted in different months difficult to interpret. This problem is compounded by the fact that many seabird species are variable breeders from year to year. The timing of when they breed and even whether they breed can change based on food availability and a number of oceanographic conditions. As such, even direct comparisons of surveys conducted in the same month over several years may not provide true indications of population increases or decreases but may instead reflect nothing more than natural variation in breeding occurrences and timing between years.

In summary, there is no indication in this data of a decline in seabird populations on Kaula over time; though data collected at Kaula is difficult to interpret for the reasons mentioned. Consistently timed surveys over longer periods might better inform true seabird population trends. Future efforts may focus on winter or spring surveys, to target the Birds of Conservation Concern. Both albatross species and gray-backed terns are winter/spring breeders. Additionally, novel survey methods will be considered as technologies become increasingly available and applicable (e.g., drones, acoustic recording devices).

This section provides a summary of results for the 11 aerial digital surveys conducted at Kaula Island from April 2013 through August 2023; the individual reports for the 11 surveys are available online at the Nave Marine Species Monitoring website (https://www.navymarinespeciesmonitoring.us/reporting/pacific/). A summary of the findings for all aerial surveys is presented in Table E-14. Refer to Table E-13 for a summary of results for the land-based and boat-based surveys conducted prior to 2013.

E.3.1 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—April 2013

Findings

A total of 18,795 birds (11 species) and 11 marine mammals (1 species) were recorded on Kaula Island during April 2013 (Table E-2). Sooty terns (n=14,635) were the most abundant bird species, and black-footed albatross (n=3) were the least abundant.

Table E-2: Total Number of Birds and Marine Mammals Recorded on Kaula Island During the April 2013 Survey

Species/Group	Total Number Recorded
Birds	
Black-footed albatross	3
Laysan albatross	20
Red-tailed tropicbird	314
Great frigatebird	1,415
Masked booby	550
Brown booby	101
Red-footed booby	1,690
Brown noddy	57
White tern	6
Sooty tern	14,635
Grey-backed tern	4
Total Birds	18,795
Marine Mammals	
Hawaiian monk seal	11
Total	
Total Birds and Marine Mammals	18,806

Generally, birds were evenly distributed across the whole island with higher concentrations in the southeast and northern sections and a sparse distribution in the southeast corner (Figure E-3). Great frigatebirds were widely distributed with higher concentrations on the east side of the island. Boobies were also widely scattered—masked boobies were recorded along the central higher areas, and brown and red-footed boobies were recorded slightly lower down and in most sections of the island. Terns were recorded mainly on the slopes on the northwest and southwest sections of the island. Red-tailed tropicbirds were grouped together on the east side of the island. Hawaiian monk seals were recorded on the east side of the island. Details on the survey findings for each species are summarized below.

Black-footed Albatross

Three black-footed albatrosses were recorded sitting close together at the very northern end of the island close to the cliff top. This species hasn't been recorded since 1998, when 10 were observed during a land-based survey (Table E-13).

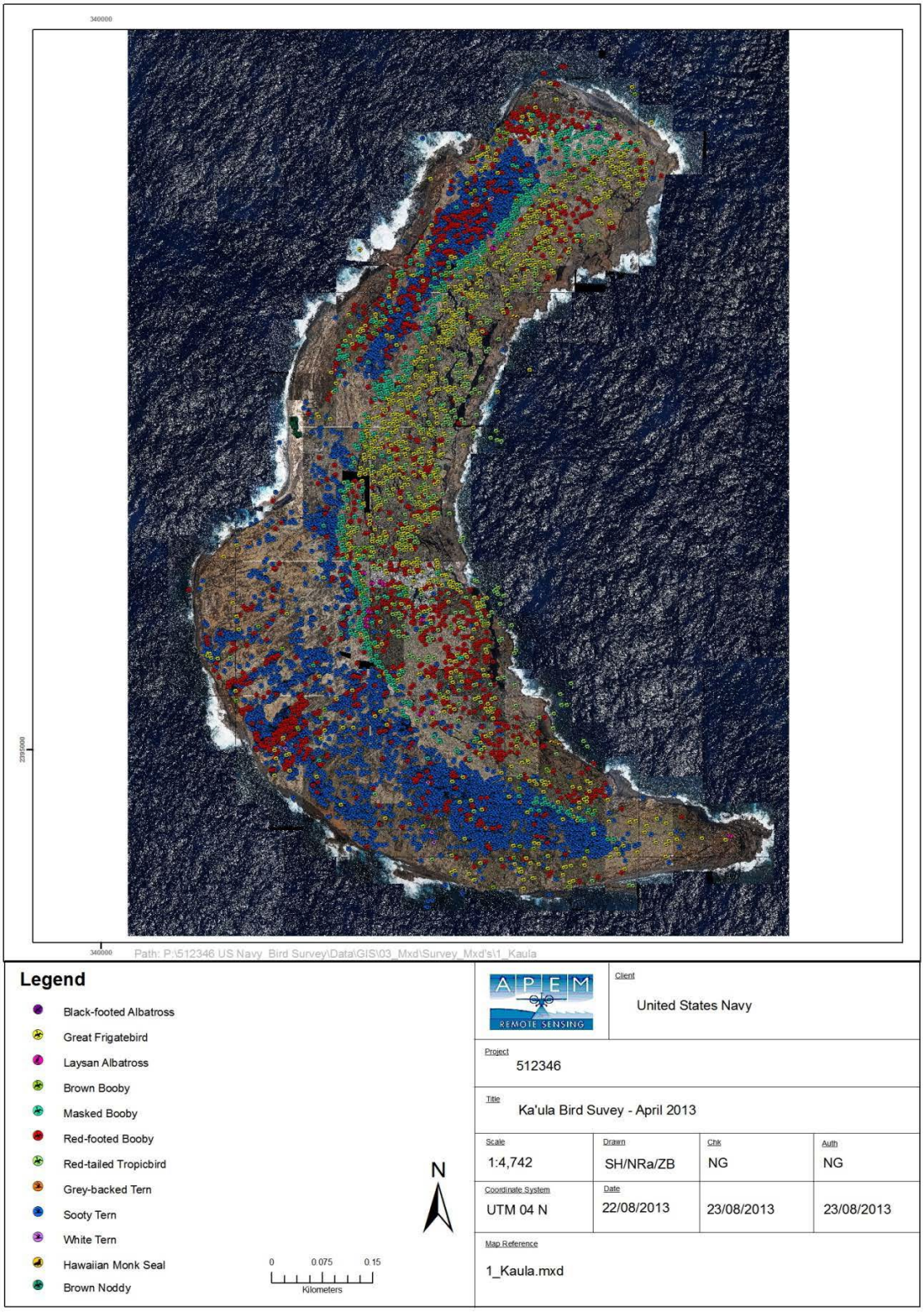


Figure E-3: Distribution of the Bird Species and Marine Mammals Recorded During the April 2013 Survey

Laysan Albatross

A total of 20 Laysan albatross were recorded during the surveys; 4 of these were recorded in flight low over the island and 16 were sitting. The majority were present along the highest ridge of the island, with a small group of four birds present towards the northern end, a cluster in the center of the island, and a single bird in the southeast end. All appeared to be adults sitting mostly on bare areas of ground however one appeared to be sitting on vegetation that could possibly be a nest.

Red-tailed Tropicbird

A total of 314 red-tailed tropicbirds were recorded. Of these, 224 were flying and 90 were sitting. They were mostly found on the east side of the island mainly in the concave section with relatively few present in the southeast and northern parts. During the oblique survey, birds were recorded under overhangs on the eastern side of the island; these birds would not have been detected from the vertical surveys.

Great Frigatebird

A total of 1,415 great frigatebirds were recorded during the survey. Of these, 125 were flying and 1,290 were sitting. There was a higher concentration on the east side of the island with only a few birds present in the southwest section. There were scattered nesting colonies especially on the slopes and ravines on the eastern side. Thirty-seven juveniles were observed in nests, and 296 of the 1,290 sitting birds were on occupied nests.

Masked Booby

A total of 550 masked boobies were recorded during the survey; 2 of these were flying and 548 were sitting. The highest concentrations were recorded in the northern section of the island mainly along the higher ground and along the ridge crest in the center of the island. A large number of birds could be seen occupying nests, and six juvenile birds were recorded in nests.

Brown Booby

A total of 101 brown boobies were recorded during the survey; 6 of these were flying low over the island and 95 were sitting. They were widely distributed across the whole island with no significant concentrations. Virtually all the sitting birds appeared to be on nests.

Red-footed Booby

A total of 1,690 red-footed boobies were recorded during the survey. Of these, 24 were in flight and 1,666 were sitting. They were widely distributed across most of the island with the highest concentrations in the north and northwestern sections along with a cluster in the east concave section. Thirty-two juvenile birds could be seen in nests, and many of the sitting adult birds also appeared to be on nests.

Brown Noddy

From the oblique imagery, a total of 57 brown noddies were recorded sitting on the northwestern cliffs.

White Tern

Six white terns were recorded during the survey and these were all sitting. Four were located in the southwest section of the island and two were in the northwest section.

Sooty Tern

A total of 14,635 sooty terns were recorded during the survey, of which 412 were flying and 14,223 were sitting. They were present in high concentrations both in the southwest and northwest sections with relatively few birds recorded in the east side other than birds mainly in flight.

Grey-backed Tern

Four grey-backed terns were recorded during the survey, and all of them were sitting. All were recorded in the southwest or northwest section amongst sooty terns.

Marine Mammals

During the course of the survey, 11 Hawaiian monk seals were recorded on ledges on the eastern side of the island. Two were in the northeastern section and nine were resting on the larger ledges towards the southeastern section.

Discussion

Overall, a total of 18,795 birds and 11 Hawaiian monk seals were recorded during the vertical and oblique surveys on Kaula Island during April 2013. The most abundant species was sooty tern, accounting for 78 percent of all seabirds recorded, compared to 74 percent in 2012. The next-most abundant species were red-footed booby, great frigatebird, masked booby, and red-tailed tropicbird (Table E-2). Grey-backed tern (n=4) and black-footed albatross (n=3) were the least abundant species recorded.

Numbers of black-footed albatross, great frigatebird, red-footed booby, and sooty tern recorded during the April 2013 survey were generally higher than recorded in past land and boat surveys (Table E-13). This could be due to seasonal timing, or the aerial imagery allowing for accurate counts to be made of relatively tight clustered groups of birds on ledges and small plateaus that may not have been visible or may have been disturbed during previous surveys. Numbers recorded in this survey for Laysan albatross, red-tailed tropicbirds, masked booby, brown booby, grey-backed tern, and white tern, are generally comparable to counts made from previous surveys.

The recorded number of brown noddy in April 2013 was lower than past surveys, which is possible due to the time of year that the birds are breeding. The absence of any wedge-tailed shearwaters or petrels was not unexpected as they were likely to be inside burrows and are also mainly nocturnal in the breeding season. Locating these species would be difficult with any survey method other than land-based surveys.

E.3.2 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—August 2013

Findings

In total, 5,733 birds of nine species were recorded during the survey with brown noddies being the most abundant species (n=3,713) followed by great frigatebirds (n=1,369) (Table E-3). A number of other species were recorded including Laysan albatrosses, red-tailed tropicbirds, masked boobies, brown boobies, red-footed boobies, black noddies, and sooty terns.

Table E-3: Total Number of Birds and Marine Mammals Recorded During the August 2013 Survey

Species/Group	Total Number Recorded
Birds	
Laysan albatross	11
Red-tailed tropicbird	85
Great frigatebird	1,369
Masked booby	219
Brown booby	109
Red-footed booby	191
Brown noddy	3,713
Black noddy	22
Sooty tern	7
Total Birds	5,726
Marine Mammals	
Hawaiian monk seal	7
Total	
Total Birds and Marine Mammals	5,733

Generally, birds were distributed across the whole island with higher concentrations along the eastern and western coastlines and in the north of the island (Figure E-4). Laysan albatross were observed mainly along the central ridge of the island. Great frigatebirds were widely distributed with higher concentrations on the east side of the island. Boobies were also widely scattered—masked boobies were recorded along the central higher areas, brown and red-footed boobies were recorded slightly lower down and in most sections of the island. Brown noddies were mainly located in the southwestern section of the island and a small group of black noddies was also observed in the south of the island. Sooty terns were recorded in the center and southwestern section of the island. Red-tailed tropicbirds were grouped together on the east side of the island. Hawaiian monk seals were recorded in the south of the island and on ledges in the northeastern section. Details on the survey findings for each species are summarized below.

Laysan Albatross

A total of 11 Laysan albatross were recorded on Kaula Island during the August 2013 survey. The majority were present along the highest ridge running through the center of the island, with individual birds located in the southeastern and southwestern sections of the island. All but one bird appeared to be adults sitting mostly on bare areas of ground; however, one bird, possibly an immature, was in flight over the western side of the island.

Red-tailed Tropicbird

A total of 85 red-tailed tropicbirds were recorded. They were mostly found on the east side of the island mainly in the concave section, with relatively few present in the southern and northern parts of the island. A small number of birds were recorded flying close to the eastern cliffs and several birds were seen sitting on ledges or nests from the oblique survey in this area.

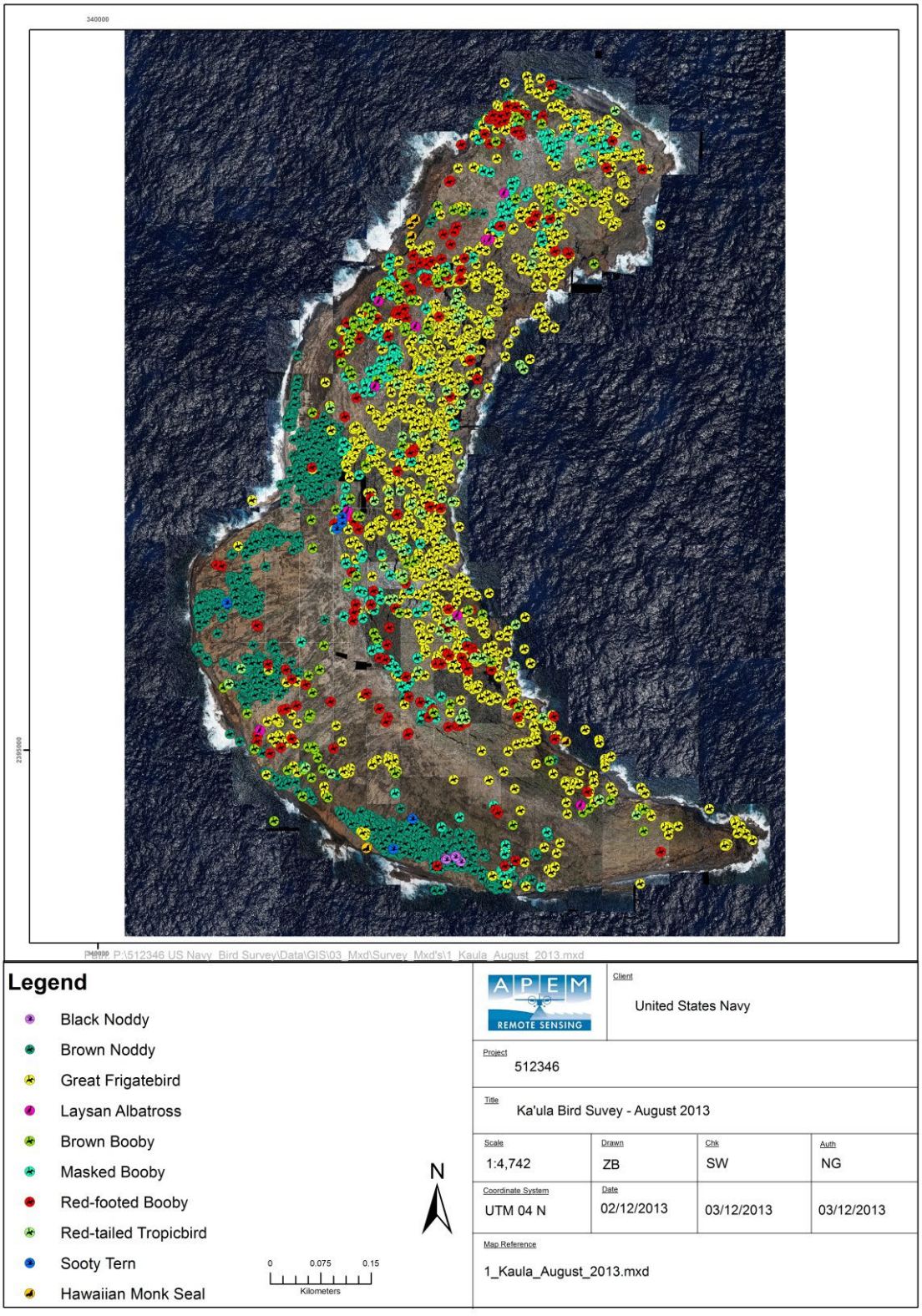


Figure E-4: Distribution of the Bird Species and Marine Mammals Recorded During the August 2013 Survey

Great Frigatebird

A total of 1,369 great frigatebirds were recorded during the survey. High concentrations were observed in the northern section and along the east side in the concave section of the island. Few birds were present in the southwest section. There were scattered nesting colonies especially on the slopes and ravines on the eastern side, with many birds still on occupied nests. Several juveniles could also be seen in nests from the oblique survey.

Masked Booby

A total of 219 masked boobies were recorded during the survey. The highest concentrations were recorded in the northern section of the island mainly along the higher ground and along the ridge crest in the center of the island. At least 30 were juveniles, some of which were resting close to adult birds mainly along the central ridge.

Brown Booby

A total of 109 brown boobies were recorded on Kaula Island during the August 2013 survey. They were widely distributed across the whole island with no significant concentrations. Fewer birds were observed in the southeastern section of the island.

Red-footed Booby

A total of 191 red-footed boobies were recorded during the survey. They were widely distributed across most of the island with the highest concentrations in the north and northwestern sections along with a cluster in the east concave section. Ten were seen under crevices from our oblique survey.

Brown Noddy

A total of 3,713 brown noddies were mainly recorded along the cliffs on the western side of the island. High numbers were recorded in the southwestern section and to the west of the center of the island. Small numbers were also observed in flight over the island and scattered across the northwestern section with around 30 birds on cliffs at the northern end.

Black Noddy

A total of 22 black noddies were recorded during the survey. All were located in the south of the island mixed in with brown noddies towards the ledges on the western side of Kaula Island.

Sooty Tern

Seven sooty terns were recorded on Kaula Island during the August 2013 survey. Three were located in the center of the island and two were observed in the southwestern section with the remaining individual recorded to the west of the center of the island.

Marine Mammals

During the course of the survey, seven Hawaiian monk seals were recorded resting on ledges on the island. A group of four was recorded in the northwestern section and two were resting on a ledge in the southwestern section. A single seal was also observed in the southeastern section of the island.

Discussion

A total of 5,733 birds and seven Hawaiian monk seals were recorded on Kaula Island on August 21, 2013 (Table E-3). The nine bird species present were Laysan albatross, red-tailed tropicbird, great frigatebird,

masked booby, brown booby, red-footed booby, brown noddy, black noddy and sooty tern. The most abundant species was brown noddy, accounting for 65 percent (n=3,713) of all seabirds recorded. The next-most abundant species were great frigatebird, masked booby, and red-footed booby. Laysan albatross (n=11) and sooty tern (n=7) were the least abundant species recorded.

The number of brown noddies and black noddies recorded during in August 2013 were higher compared to past surveys. It should be noted that brown noddies and black noddies could not be separated in some previous surveys, making comparison to previous surveys difficult.

Numbers of the Laysan albatross, red-tailed tropicbird, great frigatebird, masked booby, recorded in this survey were higher to previous counts made from previous land-based surveys but lower than those estimated in April 2013, which could be a produce of seasonal timing or breeding cycles. The estimated number of brown boobies was comparable to previous surveys.

The number of red-footed booby and sooty tern recorded were lower in August 2013 than previous surveys; this could be due to breeding cycles.

E.3.3 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—January 2014

Findings

A total of 879 birds (6 species) and 5 marine mammals (2 species) were recorded on Kaula Island during January 2014 (Table E-4). Great frigatebirds (n=621) were the most abundant bird species, and brown booby (n=3) were the least abundant.

Table E-4: Total Number of Birds and Marine Mammals Recorded on Kaula Island during the January 2014 Survey

Species/Group	Total Number Recorded
Birds	
Black-footed albatross	11
Laysan albatross	81
Great frigatebird	621
Masked booby	65
Brown booby	3
Red-footed booby	98
Total Birds	879
Marine Mammals	
Hawaiian monk seal	5
Humpback whale	8
Total	
Total Birds and Marine Mammals	892

Generally, birds were distributed across the whole island with higher concentrations along the eastern and western coastlines and in the north of the island (Figure E-5).



Figure E-5: Distribution of the Bird Species and Marine Mammals Recorded During the January 2014 Survey

Black-footed albatrosses were present in the far north of the island. Laysan albatrosses were distributed mainly in the northern half and along the central ridge of the island. Great frigatebirds were concentrated on the northeast side of the island. Boobies were widely scattered—masked boobies were recorded along the central higher areas, brown and red-footed boobies were recorded slightly lower down the island. Hawaiian monk seals were recorded in the northeastern section of the island. Eight humpback whales were recorded by visual observation, which were all within one kilometer of the island itself. Details on the survey findings for each species are summarized below.

Black-footed Albatross

A total of 11 black-footed albatrosses were recorded on Kaula Island during the survey. The majority were single birds sitting on higher ground on the northern horn of the island. One pair were sitting amongst the vegetation at the north tip of the island and a single bird was flying east over the northern edge of the island heading out to sea.

Laysan Albatross

A total of 81 Laysan albatrosses were recorded on Kaula Island during the survey. The majority were present along the highest ridge running through the center of the island, with individuals located in the southeastern and northern sections of the island. Birds were mostly recorded sitting on bare areas of ground with 16 pairs of Laysan albatross observed sitting together. A total of four birds were recorded in flight over the center of the island.

Great Frigatebird

A total of 621 great frigatebirds were recorded during the survey. High concentrations were present in the northern section and along the east side in the concave section of the island. Very few birds were present in the southern half of the island. There were scattered nesting colonies especially on the slopes and ravines on the eastern side, with many birds on occupied nests. Small clusters of male great frigatebirds could also be seen displaying their red gular pouches (throat area).

Masked Booby

A total of 65 masked boobies were recorded during the survey. The highest concentrations were in the northern section of the island, mainly on the higher ground and along the ridge crest in the center of the island. Smaller numbers were along the central ridge in the southern section of the island and a single bird was flying over the south-west slope.

Brown Booby

Three brown boobies were recorded on Kaula Island during the survey. Two were sitting on the eastern slope in the center of the island in close proximity to nesting great frigatebirds and small groups of red-footed and masked boobies. A further individual was resting in the south-east of the island towards the central ridge.

Red-footed Booby

A total of 98 red-footed boobies were recorded during the survey. They were widely distributed with the majority of birds recorded along the central ridge of the island and on higher ground. A cluster of 40 red-footed boobies were observed alongside a number of great frigatebirds in the north of the island on the eastern slope.

Marine Mammals

During the course of the survey, five Hawaiian monk seals were recorded resting on ledges on the island. All five seals were together in one group in the northeast concave section of the island. Although not captured in the survey imagery, eight humpback whales were seen from the survey aircraft, ranging between 200 m and approximately 1 km from the island.

Discussion

A total of 879 birds and 5 Hawaiian monk seals were recorded on Kaula Island on January 29, 2014 (Table E-4). The six bird species present were black-footed albatross, Laysan albatross, great frigatebird, masked booby, brown booby and red-footed booby. The most abundant species was great frigatebird, accounting for 71 percent (n=621) of all the seabirds recorded. The next-most abundant species were red-footed booby (n=98), Laysan albatross (n=81) and masked booby (n=65). Black-footed albatross (n=11) and brown booby (n=3) were the least abundant species recorded.

The numbers of black-footed albatross and Laysan albatross recorded during the January 2014 surveys were higher than recent past surveys.

The numbers of great frigatebird, red-footed booby, masked booby, brown booby recorded during the January 2014 surveys were lower than recent past surveys. The higher numbers recorded during August 2013 suggest that breeding on Kaula could occur mainly through the summer months.

E.3.4 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—January 2015

Findings

A total of 1,147 birds (7 species) and 17 marine mammals (2 species) were recorded on or around Kaula Island during January 2015 (Table E-5). Great frigatebirds (n=748) were the most abundant bird species, and red-tailed tropicbird (n=1) was the least abundant species.

Table E-5: Total Number of Birds and Marine Mammals Recorded on Kaula Island During the January 2015 Survey

Species/Group	Total Number Recorded
Birds	
Black-footed albatross	3
Laysan albatross	100
Great frigatebird	748
Masked booby	84
Brown booby	2
Red-footed booby	209
Red-tailed tropicbird	1
Total Birds	*1,147*
Marine Mammals	
Hawaiian monk seal	7
Humpback whale	10
Total	
Total Birds and Marine Mammals	1,164

Higher concentrations of birds were located in the north than in the south of the island mostly along the eastern slopes, northern flatter areas, and along the central ridge with low numbers recorded on the west and south sections (Figure E-6).

Black-footed albatrosses were present in the far north of the island close to the cliffs. Laysan albatrosses were distributed mostly to the east of the central ridge of the island. Great frigatebirds were concentrated on the northeast side of the island. Boobies were widely scattered, with the majority located along the northern central ridge. Masked boobies were recorded along the higher areas of the island, brown boobies were on the eastern slope, and red-footed boobies were more widely distributed throughout the island, though none were recorded in the southern section. Hawaiian monk seals were recorded in the northeast and southeast sections of the island. Ten humpback whales were recorded by visual observation approximately 200–300 m southeast of the island. Details on the survey findings for each species are summarized below.

Black-footed Albatross

A total of three black-footed albatrosses were recorded on Kaula Island during the survey. They were single birds sitting on higher ground on the northern horn of the island.

Laysan Albatross

A total of 100 Laysan albatrosses were recorded on Kaula Island during the survey, of which 33 were identified from the oblique imagery. The majority were present along the higher areas of the eastern slopes and along the ridge running through the center of the island, with a few individuals located in the northern grassy sections of the island and a single individual resting in the most south-easterly tip. A total of 89 birds were recorded sitting (67 in singles and 11 in pairs), eight were standing and three were in flight over the island. Of the sitting birds, five singles were noted to be present on the same ledges or exact locations as the January 2014 survey. A pair on the northern tip of the island seemed to be attending to a juvenile.

A total of 33 birds were only visible in the oblique imagery, these were noted either sitting under shady overhanging ledges or small caves. One large cave contained five individual birds observed sitting on nests which could be categorized as apparently occupied nests (AON's).

Great Frigatebird

A total of 748 great frigatebirds were recorded during the survey. Apart from a single bird in flight in the southwest section, virtually all were present in the northern half and along the east side in the concave section of the island. There were scattered nesting colonies especially on the slopes and ravines on the eastern side, with many birds on apparently occupied nests. Small clusters of male great frigatebirds could also be seen displaying their red gular pouches (throat area).

Masked Booby

A total of 84 masked boobies were recorded during the survey. The majority were present along the highest ridge running through the center of the island and along the west side on the convex section of the island, mainly on the higher ground. Smaller numbers were present along the central ridge in the southern section of the island and on lower ground on the east side.

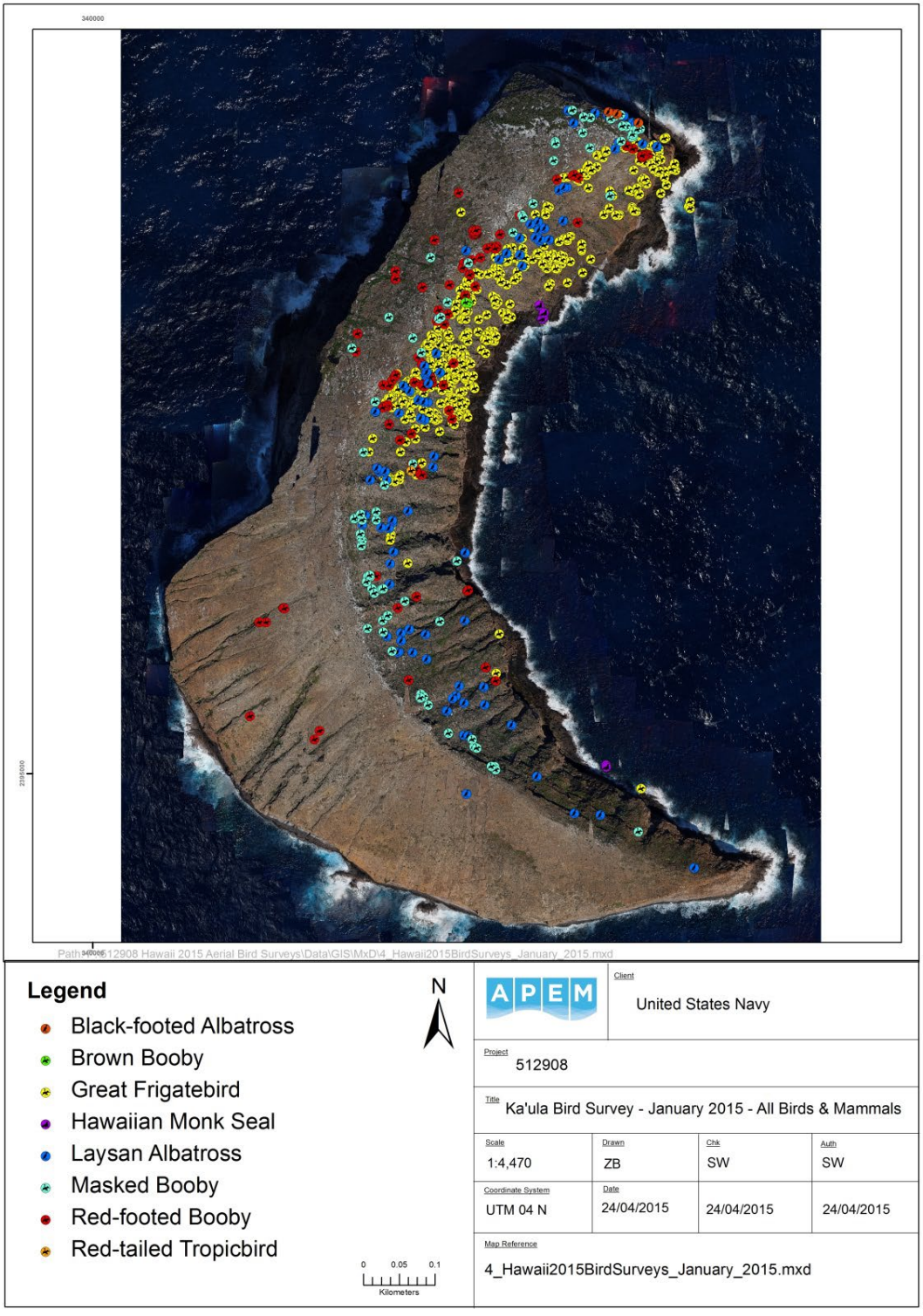


Figure E-6: Distribution of the Bird Species and Marine Mammals Recorded During the January 2015 Survey

Brown Booby

Two brown boobies were recorded on Kaula Island during the survey. They were sitting on high ground on the eastern slope in the center of the island in close proximity to nesting great frigatebirds and small groups of red-footed boobies.

Red-footed Booby

A total of 209 red-footed boobies were recorded during the survey. They were widely distributed with the majority of birds present on higher ground along the northern central ridge of the island. Smaller numbers were also recorded on lower ground along the western slope. None were present in the far south of the island during both the vertical and oblique surveys.

Red-tailed Tropicbird

A single red-tailed tropicbird was recorded during the January 2015 survey. It was flying east over the eastern slopes near to the center of the island.

Marine Mammals

During the course of the surveys, seven Hawaiian monk seals were recorded resting on ledges on the island. Five seals were together in one group in the northeast concave section of the island. The remaining two seals were together in the southeast section of the island. Although not captured in the survey imagery, 10 humpback whales consisting of three individuals, a pod of four and a pod of three were seen from the survey aircraft approximately 200–300 m southeast of the island travelling in a northeasterly direction.

Discussion

A total of 1,147 birds, seven Hawaiian monk seals, and 10 humpback whales were recorded at Kaula Island during the January 2015 survey (Table E-5). The seven bird species present were black-footed albatross, Laysan albatross, great frigatebird, masked booby, brown booby, red-footed booby and red-tailed tropicbird. The most abundant species was great frigatebird, accounting for 63 percent (n=748) of all the seabirds recorded. The next-most abundant species were red-footed booby (n=209), Laysan albatross (n=100), masked booby (n=84). Black-footed albatross (n=3) and red-tailed tropicbird (n=1) were the least abundant species recorded.

Numbers of Laysan albatross, red-footed booby masked booby, recorded in during the January 2015 surveys were higher than those recorded in recent past surveys. This increase could be due to greater coverage of oblique imagery especially across the highest part of the eastern slope which contained a high density of sitting birds.

A single red-tailed tropic bird was recorded in the January 2015 survey. This is greater than what was recorded in 2014 (n=0) and less than what was recorded in the 2013 surveys.

Numbers of black albatross, great frigate bird, and brown booby, recorded in during the January 2015 surveys were generally lower than those recorded in recent past surveys. Fluctuations from previous surveys could be due to egg-laying or breeding seasons for different species.

E.3.5 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—July 2015

Findings

A total of 13,576 birds (8 species) and 9 marine mammals (1 species) were recorded on Kaula Island during July 2015 (Table E-6). Brown noddy (n=7,137) was the most abundant bird species, and white tern (n=1) was the least abundant species.

Table E-6: Total Number of Birds and Marine Mammals Recorded on Kaula Island During the July 2015 Survey

Species/Group	Total Number Recorded
Birds	
Red-tailed tropicbird	100
Great frigatebird	1,078
Masked booby	526
Brown booby	867
Red-footed booby	3,693
Red-footed booby/Masked booby	27
Brown noddy	7,137
White tern	1
Sooty tern	147
Total Birds	*13,576*
Marine Mammals	
Hawaiian monk seal	9
Total	
Total Birds and Marine Mammals	13,585

Slightly higher concentrations of birds were located in the north and east than in the south and west of the island, but overall birds were widely distributed (Figure E-7). Red-tailed tropicbirds were recorded mainly along the eastern concave section with a few singles recorded on the west side. Great frigatebirds were concentrated on the east side of the island with a number also present at the northern end. Boobies were widely scattered, with the majority located along the northern central ridge. Masked boobies were recorded mainly along the higher areas of the island, while brown and red-footed boobies were more widely distributed around the whole island. Brown noddies were recorded along the whole stretch of the west side of the island and small clusters of sooty terns were also in the west section. A single white tern was flying out from the eastern side of the island. Hawaiian monk seals were recorded mainly in the northwest part of the island. Details on the survey findings for each species are summarized below.

Red-tailed Tropicbird

A total of 100 red-tailed tropicbirds were recorded during the survey. The majority were present in the eastern concave section of the island with a small number of individuals recorded in flight on the west side of the island. Of the 60 birds sitting at least 28 were juveniles.

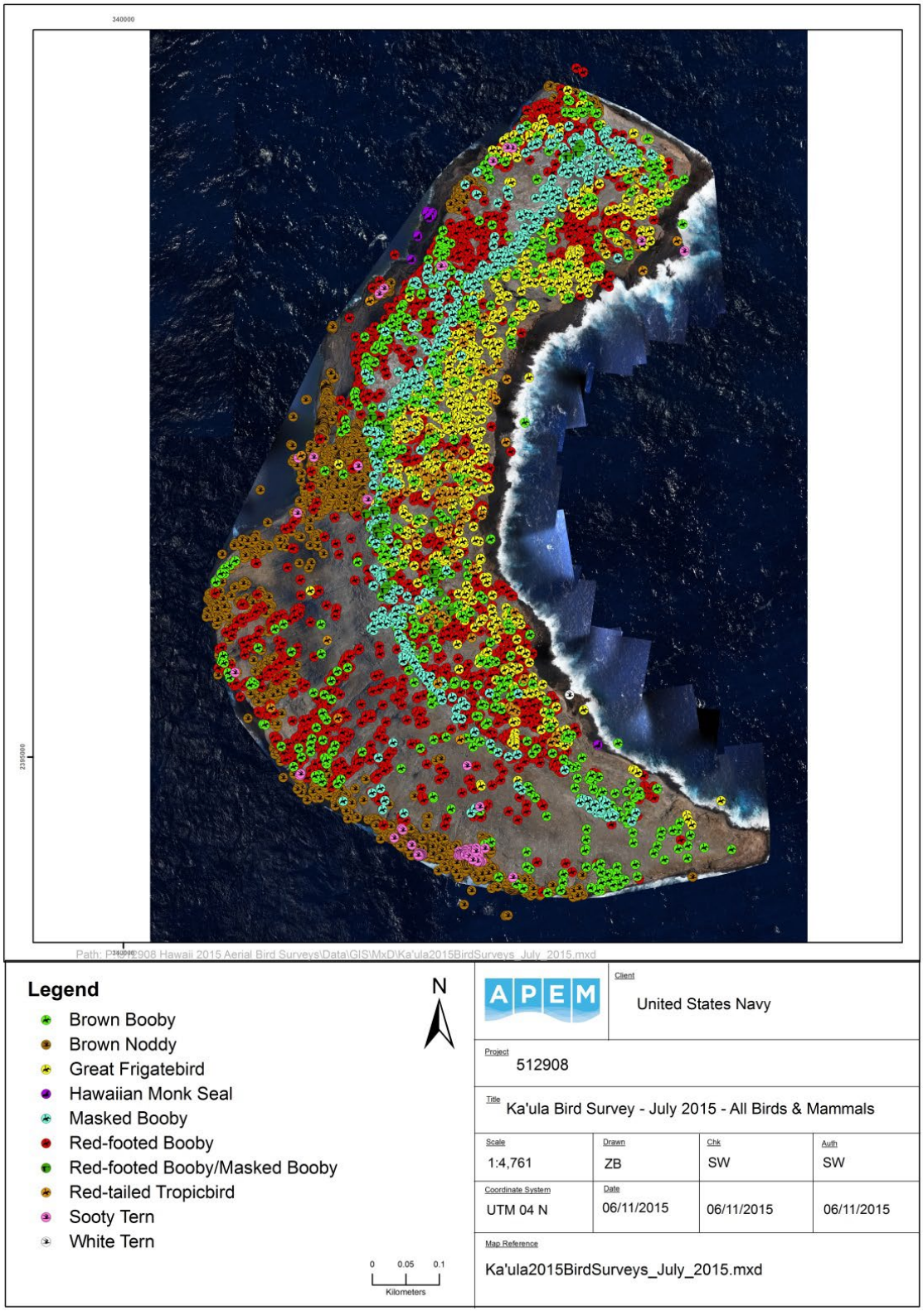


Figure E-7: Distribution of the Bird Species and Marine Mammals Recorded During the July 2015 Survey

Great Frigatebird

A total of 1,078 great frigatebirds were recorded during the survey, of which 52 were observed flying. The majority were present in the center and northern half of the island along the east side in the concave section. There were scattered nesting colonies especially on the slopes and ravines on the eastern side, with adult and young birds on nests. A total of 306 juveniles were in nests.

Masked Booby

A total of 526 masked boobies were recorded during the survey. The majority were present along the highest ridge running through the center of the island and the northern tip of the island. Smaller numbers were present on the lower slopes of the west side and small clusters were found towards the southern end. A total of 79 juvenile birds could be seen in nests accompanied by adults.

Brown Booby

A total of 867 brown boobies were recorded during the survey, of which 11 were flying. They were widely distributed throughout the whole island with fewer birds in the southwest section of the island. They were found all along the central ridge of the island. A total of 114 juveniles could be seen, mostly accompanied by adults.

Red-footed Booby

A total of 3,693 red-footed boobies were recorded during the survey, of which 67 were flying. They were widely distributed across of the whole island, with fewer present around the southern tip. Particular densities were recorded in the northwest and some parts of the eastern slopes. A total of 732 immatures were recorded which were either downy young in nests or more advanced juveniles.

Red-footed Booby/masked Booby

A total of 27 unidentified red-footed or masked boobies were recorded during the survey. The vast majority of these unidentified boobies were juveniles on nests with no adults in attendance.

Brown Noddy

A total of 7,137 brown noddies (6,483 sitting and 654 flying) were recorded during the survey, of which virtually all were along the western slopes near the cliff edges with birds in the middle of the island stretching up to almost the central ridge. Eighty-four birds were located in the oblique imagery along the lower cliffs of the west side.

White Tern

A single white tern was recorded flying towards the sea from the southeastern slope of the island.

Sooty Tern

A total of 147 sooty terns were recorded during the survey, most of which were sitting in groups nearby or amongst brown noddies.

Marine Mammals

During the course of the surveys, nine Hawaiian monk seals were recorded resting on ledges on the island. Eight seals were recorded in the northwest convex section of the island, five together and three just to the south. The remaining individual was in the southeast side of the island again resting on flat areas of rock.

Discussion

It should be noted that this year's (2016) conditions in Hawaii are influenced by a strengthening El Niño event, with associated anomalies in sea temperature, wind direction, and rainfall.

A total of 13,576 birds and nine Hawaiian monk seals were recorded at Kaula Island during the July 2015 survey (Table E-6). The eight bird species present were red-tailed tropicbirds, great frigatebird, masked booby, brown booby, red-footed booby, brown noddy, sooty tern and white tern. The most abundant species was brown noddy, accounting for 53 percent (n=7,137) of all the seabirds recorded. The next-most abundant species were red-footed booby (n=3,693), great frigatebird (n=1,078) brown booby (n=867) and masked booby (n=526). Sooty tern (n=147), Red-tailed tropicbird (n=100) and white tern (n=1) were the least abundant species recorded.

Numbers of brown booby, brown noddy, and red-footed booby recorded in July 2015 were higher than recent past surveys, with the count of red-footed boobies the highest ever recorded. In general, the higher numbers recorded during both the August 2013 and July 2015 surveys suggest that breeding for these species on Kaula could occur mainly through the summer months.

Recorded numbers of red-tailed tropicbird, great frigatebird, masked booby, and Hawaiian monk seal were generally consistent with past aerial and land-based surveys. Significant increases from past boat surveys are likely to be due to the aerial imagery allowing for more accurate counts to be made of relatively tight clustered groups of birds on high ledges and ravines that may not have been visible from a boat at sea level.

The number of sooty terns recorded in July 2015 was dramatically lower than previous summertime counts from boat-based surveys. It should be noted that El Niño events, which occurred in 2015, are most intense through equatorial Pacific and can severely negatively affect the breeding success of sooty terns (Ratcliffe et al., 1999; Wyrtki et al., 1976). It is also possible sooty terns could have bred earlier in the year as high number were present in April 2013.

E.3.6 Aerial Survey of Seabirds and Marine Mammals at Kaula Island—March 2016

Findings

Ten marine mammals (1 species) and 47,664 birds (10 species) were recorded on Kaula Island during March 2016 (Table E-7). Sooty tern (n=40,814) was the most abundant bird species, and grey-backed tern (n=1) was the least abundant species.

Table E-7: Total Number of Birds and Marine Mammals Recorded During the March 2016 Survey

Species/Group	Total Number Recorded
Birds	
Black-footed albatross	4
Laysan albatross	21
Red-tailed tropicbird	23
Great frigatebird	1,005
Masked booby	183
Brown booby	179
Red-footed booby	1,319
Brown noddy	4,115
Sooty tern	40,814

Species/Group	Total Number Recorded
Grey-backed tern	1
Total Birds	47,664
Marine Mammals	
Hawai`ian monk seal	10
Total	
Total Birds and Marine Mammals	47,674

Birds were widely distributed throughout the whole island (Figure E-8). The albatrosses were mostly found in the higher central or northern parts of the island. Red-tailed tropicbirds were recorded mainly along the eastern concave section. Great frigatebirds were concentrated on the eastern side of the island with a number also present at the northern end. Boobies were widely scattered with the majority located along the northern central ridge. Masked boobies were recorded mainly along the higher areas of the island while brown and red-footed boobies were more widely distributed around the whole island. Brown noddies were recorded along the western side of the island and seemed to be in specific clusters with only a few present amongst groups of sooty terns. Sooty terns were also concentrated along the western side of the island and some areas were densely packed. A single grey-backed tern was present amongst the sooty terns on the western side. Hawaiian monk seals were found on the ledges in the northeastern part of the island. Details on the survey findings for each species are summarized below.

Black-footed Albatross

Four black-footed albatrosses were recorded during the survey. All were at the northern end of the island in the grassed areas with three birds sitting close together and one in flight.

Laysan Albatross

Twenty-one Laysan albatrosses were recorded during the survey, of which two were flying. They were thinly distributed along the higher eastern slopes with one of the two flying birds over the western side. Of the 21 recorded, 14 of these were found during the analysis of the oblique imagery and were present in small caverns and overhangs.

Red-tailed Tropicbirds

Twenty-three adult red-tailed tropicbirds were recorded during the survey, of which all were present in the eastern concave section of the island. Seven individuals were recorded in flight, and all 16 of the sitting birds were found in the oblique imagery sitting in small caverns.

Great Frigatebirds

A total of 1,005 great frigatebirds were recorded during the survey, of which 64 were flying. Virtually all were present in the northern half of the island along the east side in the concave section with just a handful of birds present on the western side and southern section. There were scattered nesting colonies, and small groups of males could be seen displaying their red gular pouches (throat area).

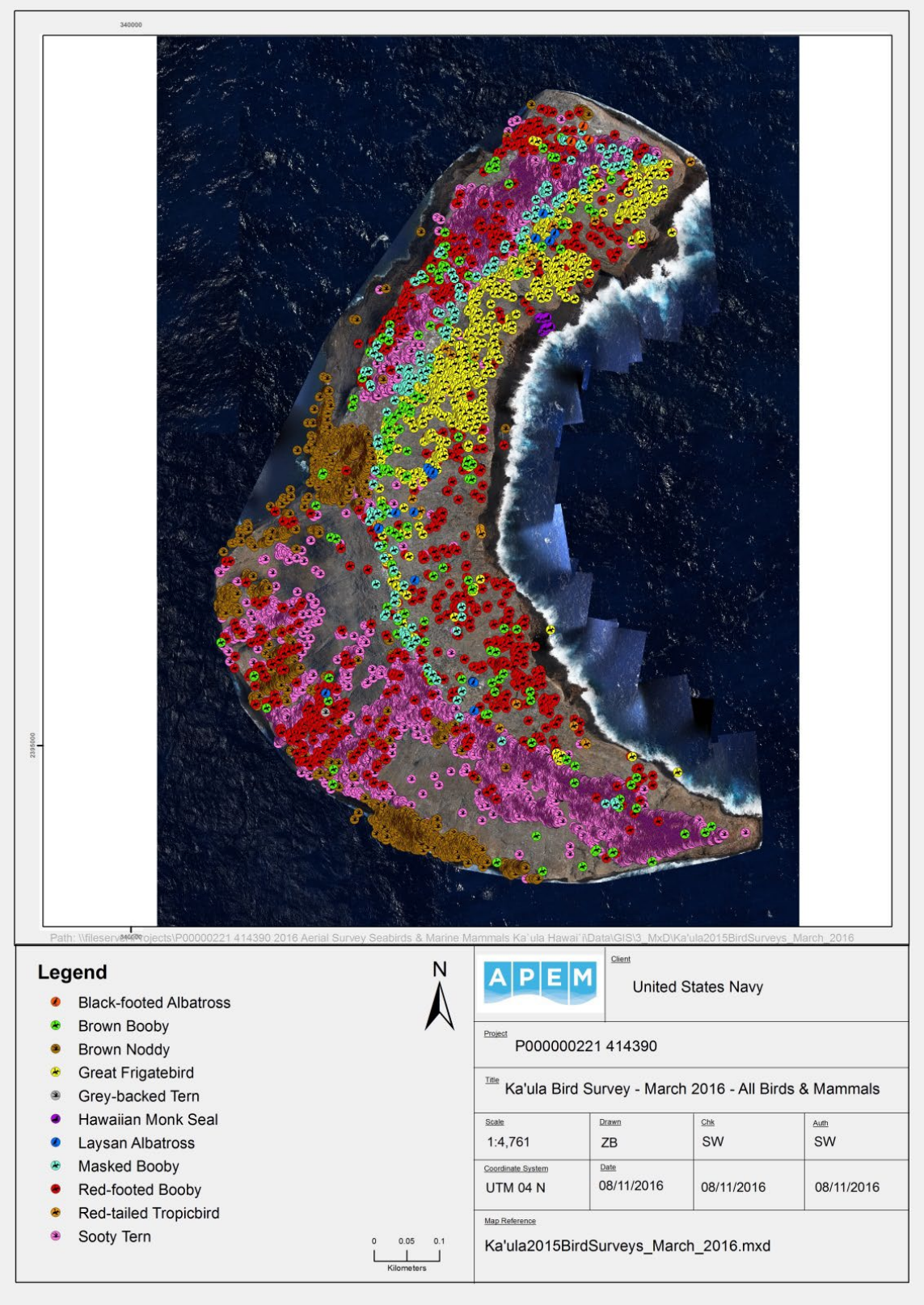


Figure E-8: Distribution of the Bird Species and Marine Mammals Recorded During the March 2016 Survey

Masked Booby

A total of 183 masked boobies were recorded during the survey, of which 2 were flying. The majority were present along the highest ridge running through the center of the island and the northern tip of the island. Smaller numbers were present on the northwest side close to the cliff edge and a small cluster was present towards the southern end, also on the ridge. Three immature/juvenile birds were noted.

Brown Booby

A total of 179 brown boobies were recorded during the survey, of which 4 were flying. They were widely distributed throughout the whole island with fewer birds in the southwest section of the island. One immature/juvenile bird was noted.

Red-footed Booby

A total of 1,319 red-footed boobies were recorded during the survey, of which 30 were flying. They were present across the whole island with particular concentrations in some of the ravines on the western and eastern sides. Fewer birds were recorded in the southern section. Forty-four immatures were recorded, many of which were perched on rocks with adults.

Brown Noddy

A total of 4,115 brown noddies (3,272 sitting and 843 flying) were recorded during the survey, of which virtually all were along the western slopes near the cliff edges. They were concentrated in four main areas. Of the total birds recorded, 331 were located in the oblique imagery along the lower cliffs of the western side where they were easily visible.

Sooty Tern

A total of 40,814 sooty terns (40,263 sitting and 551 flying) were recorded during the survey, most of which were sitting in densely packed groups on the west and south sides of the island. In the southern section, birds seemed to be more densely concentrated as over 5,000 were counted in two grid cells alone. The majority of birds recorded on the east side consisted of birds in flight, whereas in the southern section birds seem to spill over onto the sandy eastern slopes.

Grey-backed Tern

One grey-backed tern was recorded during the survey, which was present amongst sooty terns on the western side of the island.

Marine Mammals

During the course of the surveys, 10 Hawaiian monk seals were recorded resting on ledges on the northeastern side of the island.

Discussion

It should be noted that this year's (2016) conditions in Hawaii were still being influenced by an El Niño event with associated anomalies in sea temperature, wind direction, and rainfall. A total of 47,664 birds and 10 Hawaiian monk seals were recorded at Kaula Island (Table E-7). The 10 bird species present were black-footed albatross, Laysan albatross, red-tailed tropicbird, great frigatebird, masked booby, brown booby, red-footed booby, brown noddy, sooty tern, and grey-backed tern. The most abundant species was sooty tern, accounting for 86 percent (n=40,814) of all the seabirds recorded. The next-most abundant species were brown noddy (n=4,115), red-footed booby (n=1,319), and great frigatebird (n=1,005).

Masked booby (n=183), brown booby (n=179), red-tailed tropicbird (n=23), Laysan albatross (n=21), black-footed albatross (n=4), and grey-backed tern (n=1) were the least abundant species recorded.

The number of sooty terns recorded in March 2016 represents the highest count from any of the previous five aerial digital surveys. Assuming all single birds are part of a pair, then conceivably the actual numbers present could be in the region of 81,000 or 40,500 pairs. There were only 88 obviously paired up birds (two birds either stood side by side or in very close proximity to each other) visible in imagery, which could suggest that overall numbers were much higher than the 40,814 counted at the time the imagery was taken.

Recorded numbers of black-footed albatross, great frigatebird, red-footed booby, brown footed booby, masked booby, and Hawaiian monk seal were generally comparable to previous surveys, with some fluctuation noted due to seasonal differences and breeding patterns.

The number of Laysan albatross, red-tailed tropicbird, and brown noddy estimated in March 2016 were generally lower than recorded in previous surveys. Red-tailed tropicbirds nest on the ground on Kaula Island inside caverns or crevasses; Even with a combination of vertical and oblique surveys, it is likely that some individuals are hidden from view. Additional decreases the recorded numbers of these species could be due to breeding seasons.

E.3.7 Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii— July 2017

Findings

Eight marine mammals (1 species) and 14,075 birds (7 species) were recorded on Kaula Island during July 2017 (Table E-8). Brown noddy (n=7,871) was the most abundant bird species, and red-tailed tropicbird (n=502) was the least abundant species.

Table E-8: Total Number of Birds and Marine Mammals Recorded During the July 2017 Survey

Species/Group	Total Number Recorded
Birds	
Red-tailed tropicbird	502
Great frigatebird	777
Masked booby	514
Brown booby	969
Red-footed booby	2,650
Masked booby/Red-footed booby	24
Brown noddy	7,871
Sooty tern	768
Total Birds	*14,075*
Marine Mammals	
Hawaiian monk seal	8
Total	
Total Birds and Marine Mammals	14,083

Birds were widely distributed throughout the whole island during the July 2017 aerial survey (Figure E-9). The red-tailed tropicbirds and great frigatebirds were recorded mainly along the eastern concave section. Boobies were widely scattered with the majority located along the northern central ridge.

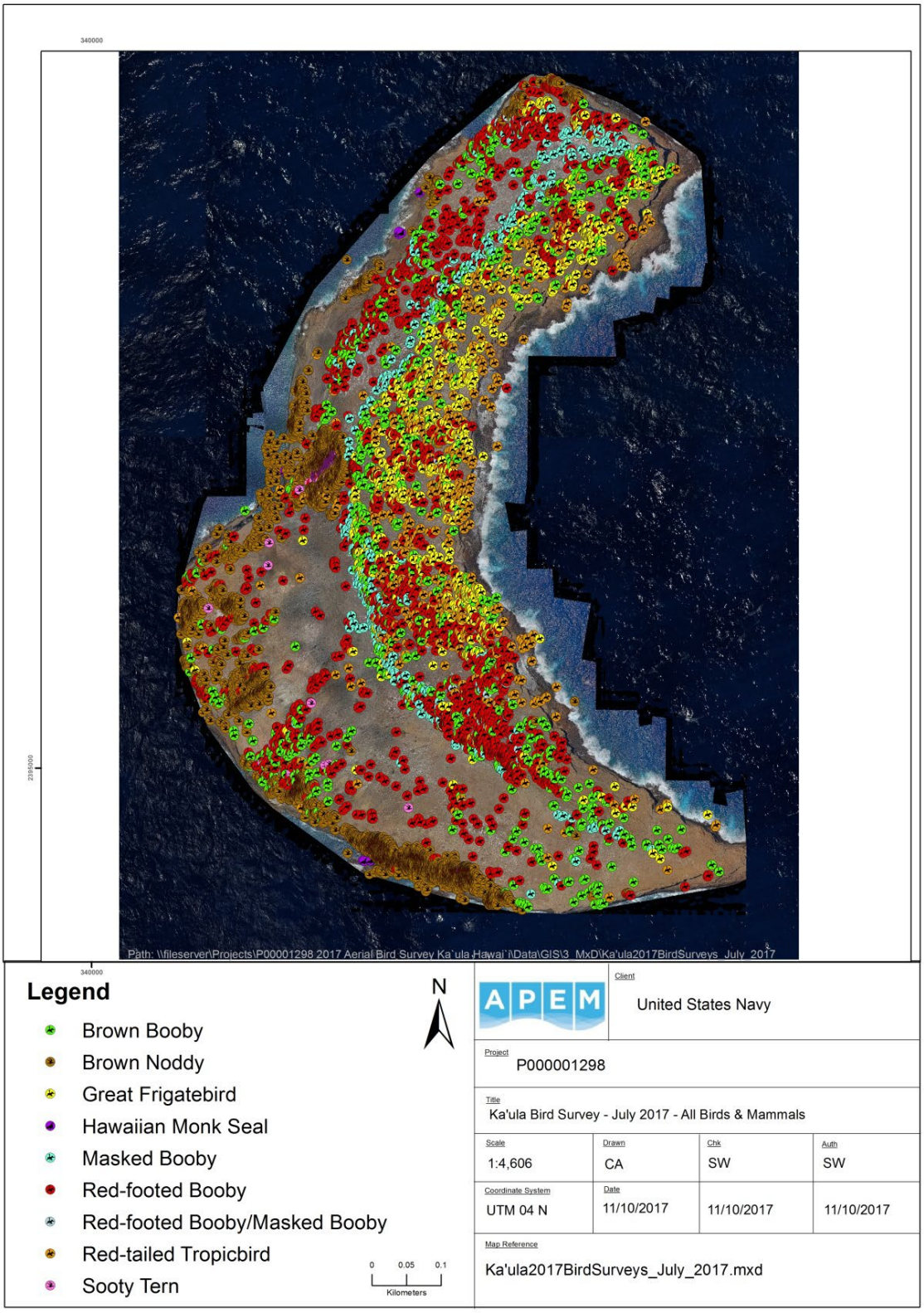


Figure E-9: Distribution of the Bird Species and Marine Mammals Recorded During the July 2017 Survey

Masked boobies were recorded mainly along the higher areas of the island while brown and red-footed boobies were more widely distributed around the whole island. Brown noddies were recorded mostly along the western side of the island close to the cliff edges. Sooty terns were also found to be along the western side of the island in small groups amongst the noddies. Hawaiian monk seals were found on the ledges along the west side of the island. Details on the survey findings for each species are summarized below.

Red-tailed Tropicbirds

A total of 502 red-tailed tropicbirds were recorded during the survey, found mostly in the eastern concave section of the island, with fewer birds at the southern and northern ends. Of the total recorded, 444 were in flight.

Great Frigatebirds

A total of 777 great frigatebirds were recorded during the survey, of which 54 were flying. Virtually all were present along the eastern side of the island in the concave section with just a handful of birds present on the west side. A total of 215 juveniles were counted in occupied nests.

Masked Boobies

A total of 514 masked boobies were recorded during the survey, of which 5 were flying. The majority were present along the highest ridge running through the center of the island and towards the northern end of the island. A total of 79 immature birds were counted, of which 41 were juveniles in nests with adults in attendance.

Brown Boobies

A total of 969 brown boobies were recorded during the survey, of which 18 were flying. Of the total recorded, 177 were either immature or juvenile birds in nests. They were widely distributed throughout the whole island, with a large cluster in the southwest section of the island.

Red-footed Boobies

A total of 2,650 red-footed boobies were recorded during the survey, of which 59 were captured in flight. Out of the total number of birds, 1,990 were adults, 439 were immatures, and 221 were juveniles in nests. They were present across the whole island.

Red-footed Boobies/Masked Boobies

A total of 24 unidentified red-footed or masked boobies were recorded during the survey, two of which were observed flying. The vast majority of unidentified boobies were immature and juvenile birds sitting on nests with no adults in attendance (n=20), although nesting substrate might suggest that these were red-footed boobies.

Brown Noddies

A total of 7,871 brown noddies (7,392 sitting and 479 flying) were recorded during the survey, of which virtually all were along the western slopes near the cliff edges. Of the total recorded, 77 were found in the oblique imagery, not visible in the vertical imagery.

Sooty Terns

A total of 768 sooty terns were recorded during the survey, of which 10 were flying. Most were found in small groups amongst the brown noddies on the west and south sides of the island.

Marine Mammals

During the course of the surveys, eight Hawaiian monk seals were recorded resting on ledges on the west side of the island.

Discussion

A total of 14,075 birds and eight Hawaiian monk seals were recorded at Kaula Island (Table E-8). The seven bird species present were red-tailed tropicbird, great frigatebird, masked booby, brown booby, red-footed booby, brown noddy, and sooty tern. The most abundant species was brown noddy, accounting for 56 percent (n=7,871) of all the seabirds recorded. The next-most abundant species were red-footed booby (n=2,650), brown booby (n=969) and great frigatebird (n=777). Sooty tern (n=768), masked booby (n=514), and red-tailed tropicbird (n=502) were the least abundant species recorded. A total of 20 sitting unidentified immature and juvenile boobies were also recorded, although nesting substrates suggest that these were most likely red-footed boobies, making a total of 24 boobies categorized as red-footed/masked.

The numbers of red-tailed tropicbirds, brown bobby, and brown noddy recorded in the July 2017 aerial surveys were higher than past surveys, with the number of red-tailed tropicbirds and brown boobies the highest count of any of the seven aerial digital surveys carried out.

Recorded numbers of red-footed booby, masked booby, and Hawaiian monk seal were generally comparable to previous surveys, with some fluctuation noted due to seasonal differences and breeding patterns.

The number of recorded great frigatebirds and sooty terns were lower in July 2017 than previous surveys. The previous survey in March 2016 reported the highest number of sooty terns to date, with 40,814 individuals recorded. This number was recorded during the peak time (March–April) in Hawaii for sooty terns; as such, the decrease in individuals recorded in July 2017 was expected.

E.3.8 Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii—August 2018

Findings

Seven marine mammals (1 species) and 23,187 birds (8 species) were recorded on Kaula Island during August 2018 (Table E-9). Brown noddy (n=7,612) was the most abundant bird species, and grey-backed tern (n=5) was the least abundant species.

Table E-9: Total Number of Birds and Marine Mammals Recorded During the August 2018 Survey

Species/Group	Total Number Recorded
Birds	
Red-tailed tropicbird	245
Great frigatebird	719
Masked booby	1,312
Brown booby	1,231
Red-footed booby	4,764
Masked booby/Brown booby	51
Booby species	713
Brown noddy	7,612
Sooty tern	6,535
Grey-backed tern	5

Species/Group	Total Number Recorded
Total Birds	*23,187*
Marine Mammals	
Hawaiian monk seal	7
Total	
Total Birds and Marine Mammals	23,194

Birds recorded during the August 2018 survey were widely distributed throughout the whole island (Figure E-10). The red-tailed tropicbirds and great frigatebirds were recorded mainly along the eastern concave section. Boobies were widely scattered with the majority located along the northern central ridge. Masked boobies were recorded mainly along the higher areas of the island while brown and red-footed boobies were more widely distributed around the whole island. Brown noddies were recorded mostly along the western side of the island close to the cliff edges. Sooty terns were also found to be along the western side of the island in dense groups amongst the noddies. Hawaiian monk seals were found on the ledges along the west side of the island. Details on the survey findings for each species are summarized below.

Red-tailed Tropicbirds

A total of 245 red-tailed tropicbirds were recorded during the survey, found mostly in the eastern concave section of the island, with fewer birds at the southern and northern ends. Of the total recorded, 233 were in flight.

Great Frigatebirds

A total of 719 great frigatebirds were recorded during the survey, of which 33 were flying. Virtually all were present along the eastern side of the island in the concave section with just a handful of birds present on the west side. A total of 79 immature birds were counted, of which 71 were juveniles in nests.

Masked Boobies

A total of 1,312 masked boobies were recorded during the survey, of which 10 were flying. The majority were present along the highest ridge running through the center of the island and towards the northern end of the island. A total of 205 immature birds were counted, of which 145 were juveniles in nests.

Brown Boobies

A total of 1,231 brown boobies were recorded during the survey, of which 29 were flying. Of the total recorded, 147 were either immature or juvenile birds in nests. They were widely distributed throughout the whole island. Of the total recorded, 223 were found in the oblique imagery, not visible in the vertical imagery.

Red-footed Boobies

A total of 4,764 red-footed boobies were recorded during the survey, of which 67 were captured in flight. Out of the total number of birds 457 were immatures and 453 were juveniles in nests. They were present across the whole island.

Masked Boobies/Brown Boobies

A total of 51 unidentified masked or brown boobies were recorded during the survey, 1 of which was flying. Of the 51 unidentified boobies, 29 were immatures and 22 were juveniles on nests with no adults in attendance.

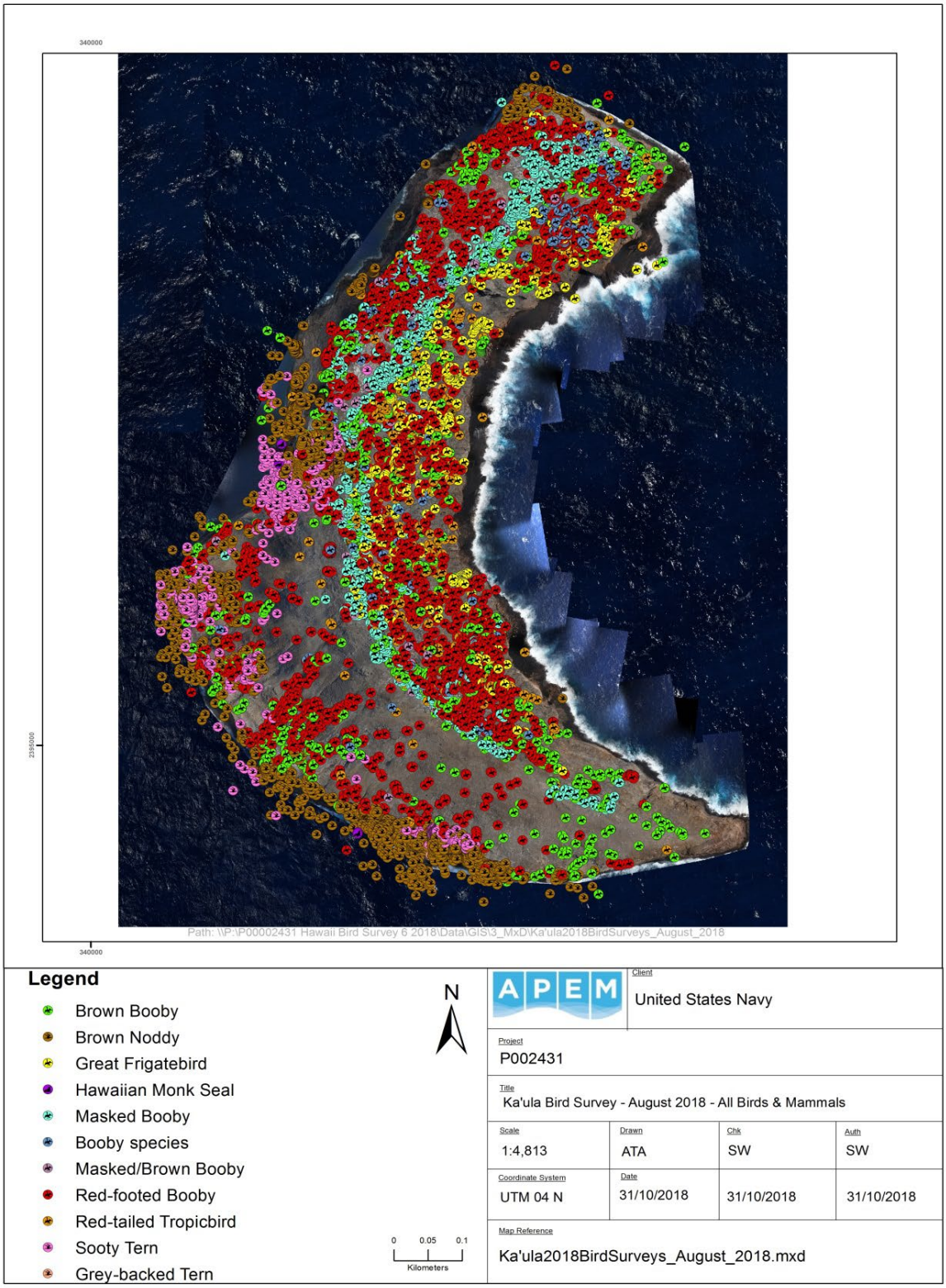


Figure E-10: Distribution of the Bird Species and Marine Mammals Recorded During the August 2018 Survey

Booby Species

A total of 713 unidentified boobies were recorded during the survey, 7 of which were flying. Of the 713 unidentified boobies counted 663 were immature birds and 50 were juveniles on nests with no adults in attendance.

Brown Noddies

A total of 7,612 brown noddies (6,777 sitting and 835 flying) were recorded during the survey, of which virtually all were along the western slopes near the cliff edges. Of the total recorded, 194 were found in the oblique imagery, not visible in the vertical imagery.

Sooty Terns

A total of 6,535 sooty terns were recorded during the survey, of which 807 were flying. Most were found in dense groups amongst the brown noddies on the west and south sides of the island.

Grey-backed Terns

A total of five grey-backed terns were recorded during the survey, of which all were recorded in the oblique imagery and were located on the southwest side of the island sitting under the cliff edge.

Marine Mammals

During the course of the surveys, seven Hawaiian monk seals were recorded resting on ledges on the west side of the island.

Discussion

A total of 23,187 birds and 7 Hawaiian monk seals were recorded at Kaula Island during the August 2018 surveys (Table E-9). The eight bird species present were red-tailed tropicbird, great frigatebird, masked booby, brown booby, red-footed booby, brown noddy, grey-backed tern and sooty tern. The most abundant species was brown noddy, accounting for 33 percent of all the seabirds recorded. The next-most abundant species were sooty tern, red-footed booby, masked booby (n=1,312) and brown booby (n=1,231). Great frigatebird (n=719), red-tailed tropicbird (n=245) and grey-backed tern (n=5) were the least abundant species recorded. A total of 764 unidentified immature boobies were also recorded.

The numbers of red-footed booby, masked booby, and sooty terns recorded during the August 2018 surveys were generally higher than recent previous surveys, with the numbers of brown bobby, and brown noddy recorded in the July 2017 aerial surveys were higher than past surveys, with the number of red-footed boobies and masked boobies the highest count recorded on the island, and the number of brown boobies the highest count of any of the eight aerial digital surveys carried out since 2013. It should be noted that the number of sooty terns was expectedly less than the number encountered during March 2016 (n=40,814) survey as the period March to April is the peak time for them in Hawaii.

Recorded numbers of re-tailed tropic bird, brown noddy, and Hawaiian monk seal were generally comparable to previous surveys, with some fluctuation noted due to seasonal differences and breeding patterns.

Although higher than what was recorded in July 2017, the number of great frigatebirds recorded in August 2018 was still lower than average when compared to the previous seven aerial digital surveys since August 2013; especially records from summer months (July or August).

E.3.9 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—November 2019

Findings

Eight marine mammals (1 species) and 2,091 birds (6 species) were recorded on Kaula Island during November 2019 (Table E-10). Red-footed booby (n=1,196) was the most abundant bird species, and red-tailed tropicbird (n=1) was the least abundant species.

Table E-10: Total Number of Birds and Marine Mammals Recorded During the November 2019 Survey

Species/Group	Total Number Recorded
Birds	
Laysan albatross	17
Red-tailed tropicbird	1
Great frigatebird	316
Masked booby	217
Brown booby	185
Red-footed booby	1,196
Booby species	159
Total Birds	***2,091***
Marine Mammals	
Hawaiian monk seal	8
Total	
Total Birds and Marine Mammals	**2,099**

Birds were widely distributed throughout the island, mostly concentrated in the northern and eastern regions (Figure E-11). Laysan albatross, great frigatebirds, and one red-tailed tropicbird were almost exclusively found along the eastern concave section of the island with frigatebirds particularly concentrated towards the north. Boobies were widely scattered. Masked boobies were mainly recorded along the central ridge, while brown and red-footed boobies were more widely distributed around the island. Hawaiian monk seals were found grouped on the eastern side of the island with one observed swimming off the southern coast. Details on the survey findings for each species are summarized below.

Laysan Albatross

A total of 17 Laysan albatross were recorded during the survey, all found on the eastern concave section of the island with a single bird at the northern end and no birds at the southern end. Of the total recorded, all were adults, and two were in flight.

Red-Tailed Tropicbird

A single red-tailed tropicbird was recorded during the survey, which was a flying adult found in the northern region of the concave eastern section of the island.

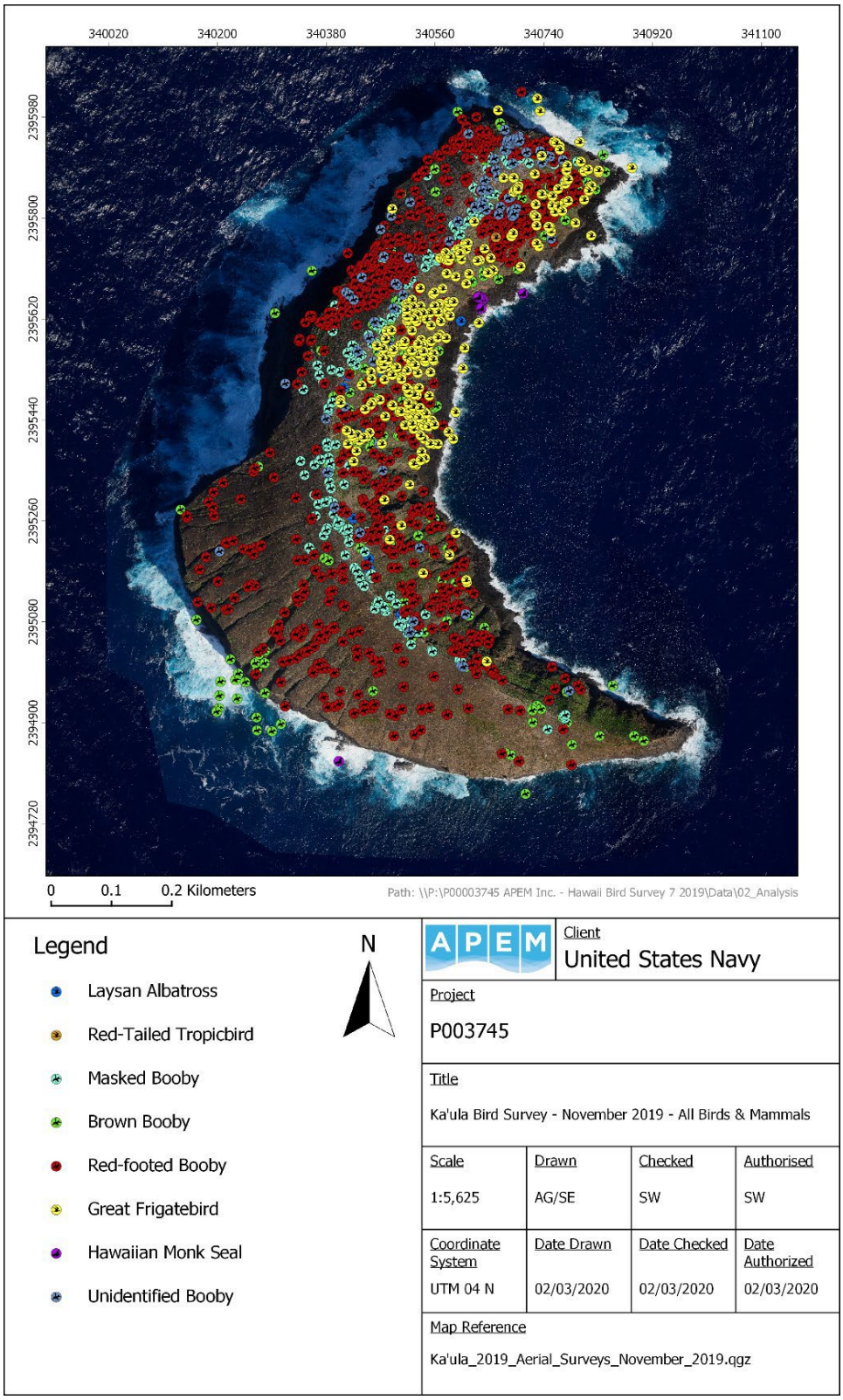


Figure E-11: Distribution of the Bird Species and Marine Mammals Recorded During the November 2019 Survey

Great Frigatebird

A total of 316 great frigatebirds were recorded during the survey, of which 83 were flying. The majority were present in the northern half of the eastern concave section of the island, with some flying just off the northern edge of the island, some distributed along the central ridge, and very few in the southern half. Two immature birds were counted, both of which were juveniles.

Masked Boobies

A total of 217 masked boobies were recorded during the survey, 1 of which was flying. The majority were present along the central northern ridge running along the island with only a few towards the southern tip of the island. Six immature birds were counted, one of which was a juvenile.

Brown Boobies

A total of 185 brown boobies were recorded during the survey, of which 34 were flying. They were widely scattered throughout the island, but with a higher concentration on the concave east side of the island. Several flying birds were present just off the coast along the western convex edge of the island. Of the total recorded, one was a juvenile.

Red-footed Boobies

A total of 1,196 red-footed boobies were recorded during the survey, of which 24 were captured in flight. Of the total, 92 were immature, one of which was a juvenile. They were present across the island with higher densities in the northern region on both sides of the ridge.

Booby Species

A total of 159 unidentified boobies were recorded during the survey, all of which were immature; 4 were flying. Individuals were mostly recorded towards the northern end of the island and were sitting in groups amongst the grasses.

Marine Mammals

During the survey, eight Hawaiian monk seals were recorded. Seven of these were resting on a section of coast in the northern region of the eastern convex side of the island; one was swimming off the southern coast.

Discussion

Overall, a total of 2,091 birds and eight Hawaiian monk seals were recorded at Kaula Island during the survey (Table E-10). The most abundant species was red-footed booby, accounting for 57 percent (n=1,196) of all the seabirds recorded. The next-most abundant species were great frigatebird (n=316) and masked booby (n=217). Brown booby (n=185), Laysan albatross (n=17), and red-tailed tropicbird (n=1) were the least abundant species recorded. A total of 159 unidentified immature boobies were also recorded.

Numbers of recorded of red-tailed tropicbirds, Laysan albatross, brown boobies, masked boobies, and great frigatebirds during the November 2019 surveys were generally lower than recorded in past land and boat surveys. The numbers of brown boobies and masked boobies in particular were substantially lower than the August 2018 survey sightings. Lower recorded numbers of species could be due to the seasonal timing of peak nesting activity, or because of the poor oblique imagery captured during the survey. Poor oblique imaging may result in any birds on or within the steep cliffs going undetected.

The 1,196 red-footed boobies recorded during this survey is higher than in January 2015, although the peak number of red-footed booby sightings from aerial digital surveys was in 2018 (n= 4,764). Surveys seem to suggest the bulk of breeding for red-footed boobies occurs during June to August.

E.3.10 Aerial Surveys of Seabirds and Marine Mammals at Kaula Island, Hawaii—July 2021

Findings

Ten marine mammals (one species) and 16,514 birds (eight species/groups) were recorded on Kaula Island during July 2021 (Table E-11). Red-footed booby (n=6,016) was the most abundant bird species, and red-tailed tropicbird (n=125) was the least abundant species.

Table E-11: Total Number of Birds and Marine Mammals Recorded During the July 2021 Survey

Species/Group	Total Number Recorded
Birds	
Booby species	184
Brown Booby	1,573
Brown Noddy	3,456
Great Frigatebird	1,375
Masked Booby	1,262
Red-footed Booby	6,016
Red-tailed Tropicbird	125
Sooty Tern	2,523
Total birds	***16,514***
Marine Mammals	
Hawaiian monk seal	10
Total	
Total Birds and Marine Mammals	***16,524***

Birds were widely distributed throughout the whole island, most concentrated in the northern and eastern regions. Brown noddies and sooty terns were almost exclusively found along the western convex section of the island, primarily on the lower slopes and cliffs. Both species were very concentrated to specific areas of the western coast. Great frigatebirds were predominantly located toward the eastern coast, similarly to the red-tailed tropicbirds mostly seen in the same area. Boobies were widely scattered. Masked boobies were mainly recorded along the central ridge, while brown and red-footed boobies were more widely distributed around the whole island. Hawaiian monk seals were found grouped on the western side of the island. Details on the survey findings for each species are summarized below.

A figure that summarizes distribution of the total bird species and marine mammals recorded on Kaula Island during the survey was not provided in the July 2021 survey report. Figure E-12 through Figure E-20 depict the distribution of each individual species recorded on Kaula Island during the July 2021 survey.



Figure E-12: Distribution of Brown Noddies Recorded During the July 2021 Survey



Figure E-13: Distribution of Sooty Terns Recorded During the July 2021 Survey

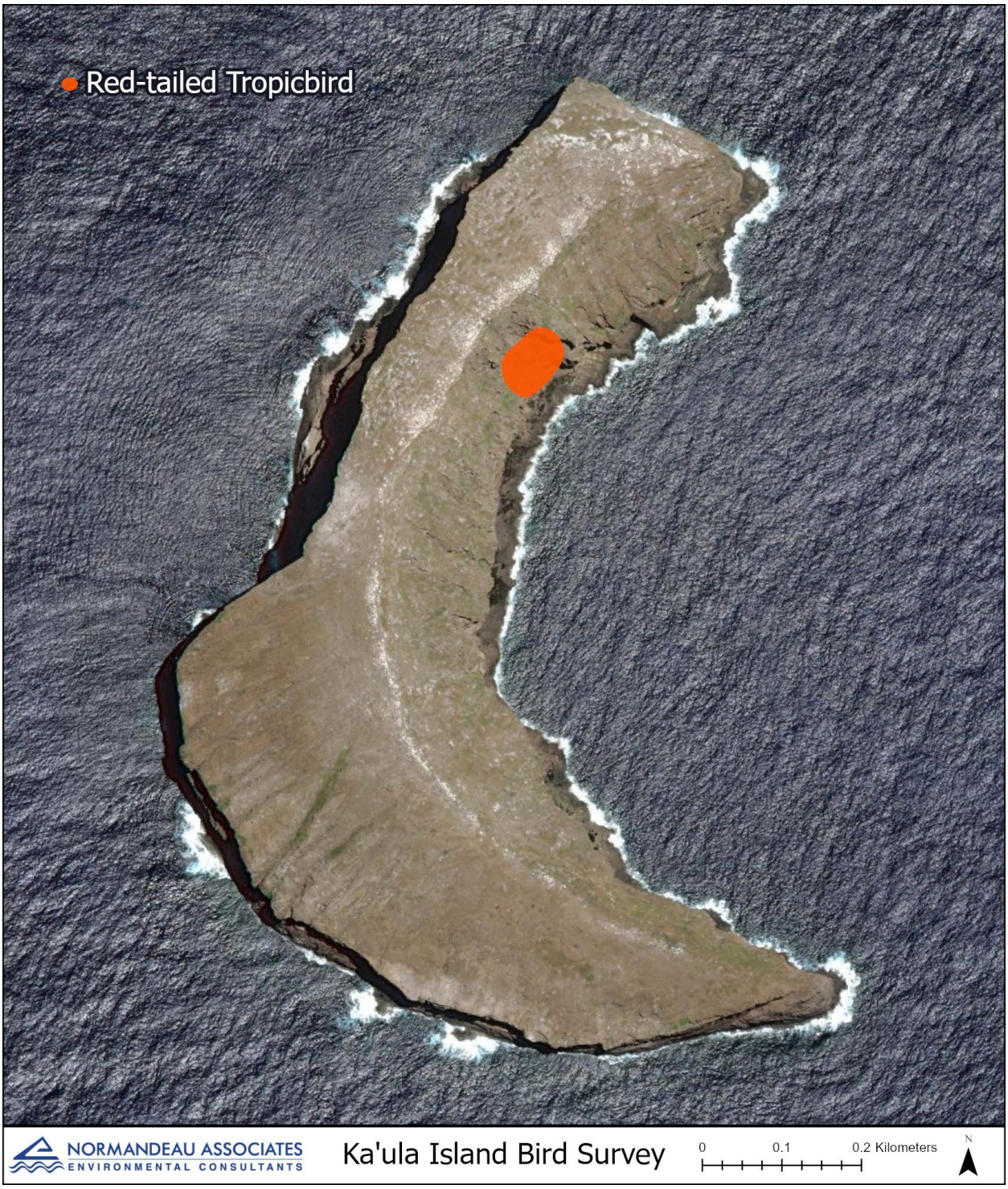


Figure E-14: Distribution of Red-Tailed Tropicbirds Recorded During the July 2021 Survey



Figure E-15: Distribution of Great Frigatebirds Recorded During the July 2021 Survey



Figure E-16: Distribution of Masked Boobies Recorded During the July 2021 Survey



Figure E-17: Distribution of Brown Boobies Recorded During the July 2021 Survey

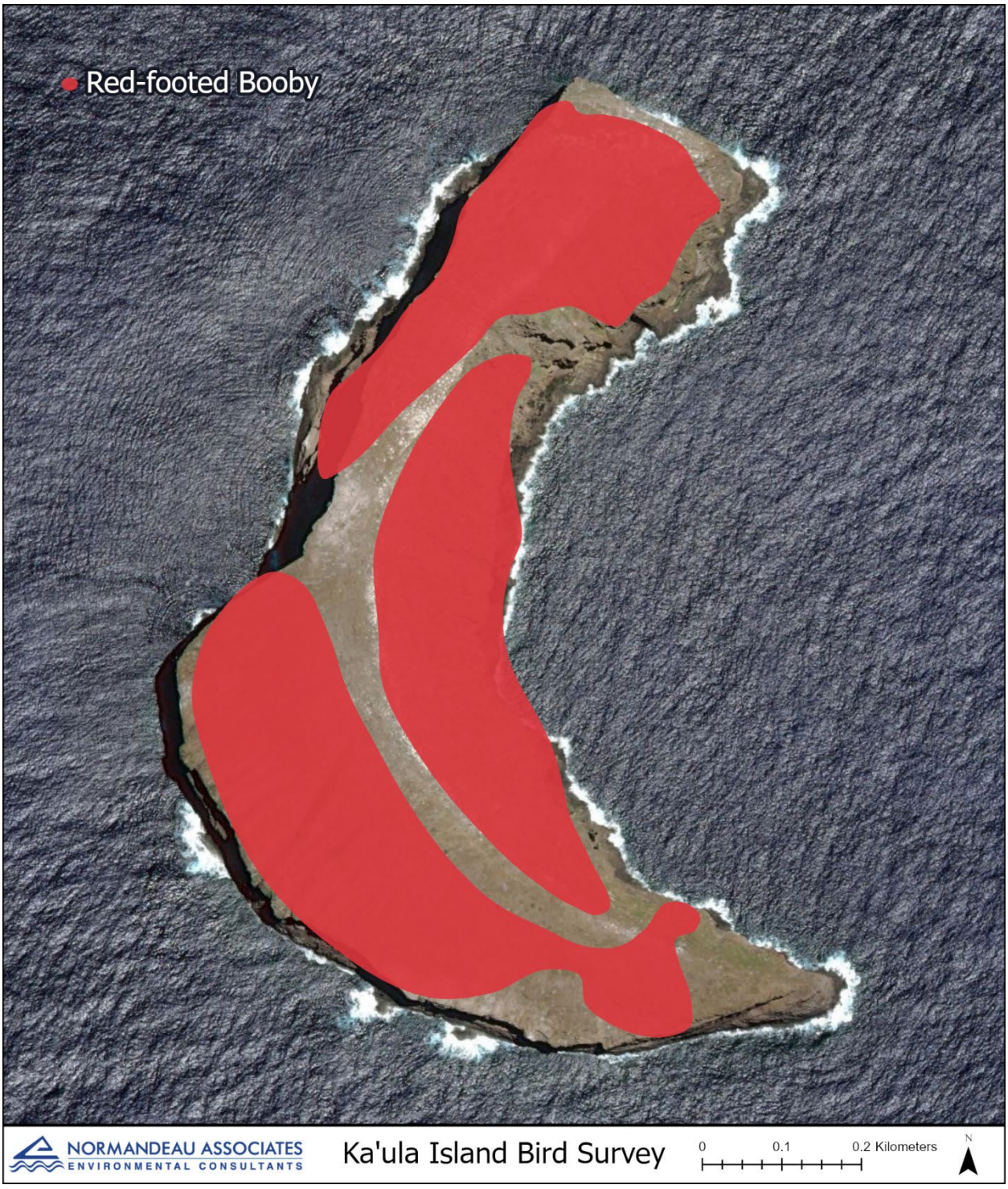


Figure E-18: Distribution of Red-Footed Boobies Recorded on Kaula Island During the July 2021 Survey



Figure E-19: Distribution of Unidentified Boobies Recorded on Kaula Island During the July 2021 Survey



Figure E-20: Distribution of Hawaiian Monk Seals Recorded on Kaula Island During the July 2021 Survey

Brown Noddy

A total of 3,456 adult brown noddies were recorded during the survey, of which 37 were flying. These were concentrated toward the southwestern slopes of the island along the cliff edges and scattered along the cliff face on the western coast.

Sooty Tern

A total of 2,523 sooty terns were recorded during the survey, of which 16 were flying. These were concentrated toward the western slopes of the island in two major flocks.

Red-Tailed Tropicbird

A total of 125 red-tailed tropicbird were recorded during the survey, of which 59 were flying. One individual in this study was recorded as juvenile while the rest were recorded as adults. These were concentrated in the concave eastern section of the island.

Great Frigatebird

A total of 1,375 great frigatebirds were recorded during the survey, of which 87 were flying. The majority were present in the northern half of the eastern concave section of the island with some flying just off the northern edge of the island, some distributed along the central ridge, and very few in the southern half. A total of 120 immature birds were counted, of which 113 were juveniles.

Masked Booby

A total of 1,262 masked boobies were recorded during the survey, of which 9 were flying. The majority were present along the central northern ridge running along the island, with only a few toward the southern tip of the island. A total of 234 immature birds were counted, of which 205 were juveniles.

Brown Booby

A total of 1,573 brown boobies were recorded during the survey, of which 1,466 were adults including 27 flying. They were widely scattered throughout the island, but with a higher concentration on the concave east side of the island and along the central ridge. Of the total recorded, 107 were immature, of which 80 were juveniles.

Red-footed Booby

A total of 6,016 red-footed boobies were recorded during the survey, of which 70 were captured in flight. Out of the total birds, 1,002 were immatures including 394 juveniles. They were present across the whole island with higher densities in the northern region of the island on both sides of the ridge.

Booby Species

A total of 184 unidentified boobies were recorded during the survey, 18 were adults, and 166 were immatures including 82 juveniles. Nine of these unidentified boobies were recorded in flight and were distributed across the island.

Marine Mammals

During the survey, 10 Hawaiian monk seals were recorded. Seven of these were resting on a section of coast in the northern region of the western convex side of the island and three were resting on the southwestern coast.

Discussion

A total 16,514 birds and 10 Hawaiian monk seals were recorded at Kaula Island during the July 2021 survey (Table E-11). Red-footed booby accounted for 36 percent (n=6,016) of all seabirds recorded. The next-most abundant species was brown noddy (n=3,456) and sooty tern (n=2,523). Brown booby (n=1,573), great frigatebird (n=1,375), masked booby (1,262), and red-tailed tropicbird (n=125) were the least abundant species recorded. A total of 184 boobies could not be recorded to species level.

The count of red footed boobies during the July 2021 survey was the highest ever recorded of all aerial digital surveys. The distribution of masked boobies is generally consistent with previous aerial surveys, with most of the species present along the central northern ridge of the island. The recorded number of brown boobies during the July 2021 survey is the highest record of this species since the September 1971 land-based survey. The July 2021 survey is also representative of the highest record of great frigate birds since the April 2013 survey.

The recorded number of sooty terns was higher than previous surveying in August 2018, likely due to the time of year that the birds are breeding. However, the number of sooty terns recorded during the July 2021 surveys is considerably lower when compared to March 2016 surveying that occurred during peak breeding season.

E.3.11 Aerial Survey of Seabirds and Marine Mammals at Kaula Island, Hawaii—August 2023

Findings

Thirteen marine mammals (one species) and 17,638 birds (nine species) were recorded on Kaula Island during the August 3, 2023, survey (Table E-12). Brown noddy (n=11,034) was the most abundant bird species, and Laysan albatross (n=3) were the least abundant.

Table E-12: Total Number of Birds and Marine Mammals Recorded During the August 2023 Survey

Species/Group	Total Number Recorded
Birds	
Brown Noddy	11,034
Sooty Tern	2,440
Gray-backed Tern	5
Red-tailed Tropicbird	206
Laysan Albatross	3
Great Frigatebird	377
Masked Booby	739
Brown Booby	1,188
Masked/Brown Booby	42
Red-footed Booby	1,369
Masked/Red-footed Booby	228
Booby-species unknown	7
Total Birds	17,638
Marine Mammals	
Hawaiian monk seal	13
Total	
Total Birds and Marine Mammals	17,651

Birds were widely distributed throughout the island. As in previous years, brown noddies were found in highest densities along the western side of the island close to the cliff edges (Figure E-21). Sooty terns were also located on the western side of the island, forming dense groups among the noddies. Red-tailed tropicbirds and great frigatebird were recorded mainly along the eastern concave section. Boobies were widely scattered with most of the population occurring along the northern central ridge. Masked boobies were primarily observed along the higher areas of the island while brown boobies and red-footed boobies were more widely distributed. Hawaiian monk seals were found on the ledges along the west side of the island. Details on the survey findings for each species are summarized below.

Brown Noddy

A total of 11,034 brown noddies (4,251 flying, 6,783 sitting) were recorded during the survey, with virtually all birds found along the western slopes near the cliff edges. Of the total recorded, 10 were identified in the oblique imagery and not visible in the vertical imagery.

Sooty Tern

A total of 2,440 sooty terns were recorded during the survey, all identified in the vertical survey, of which 781 were flying and 1,659 were sitting. The majority were in dense groups among the brown noddies on the west and south sides of the island.

Grey-backed Tern

Five grey-backed terns (4 flying, 1 sitting) were recorded during the survey, all of which were recorded in the vertical survey on the southwest side and at the northwest tip of the island.

Red-tailed Tropicbird

A total of 206 red-tailed tropicbirds were recorded during the vertical survey, of which 163 were flying. Most were found in the eastern concave section of the island with fewer birds at the southern and northern ends.

Laysan Albatross

All three flying Laysan albatrosses were recorded during the vertical survey. Two were on the east-central part of the island and the other was offshore at the north end of the island.

Great Frigatebird

A total of 377 great frigatebirds were recorded during the survey, 373 in the vertical survey and 4 in the oblique survey, of which 60 were flying. Most were present along the eastern side of the island in the concave section with just a few birds present on the west side. Of the 137 juveniles counted, 133 were in nests.

Masked Booby

A total of 739 masked boobies were recorded during the survey, of which only one was identified in the oblique imagery. Thirty-four were flying. Most were along the highest ridge running through the center of the island toward the northern end of the island. Of the 90 immature birds counted, 74 were in nests.

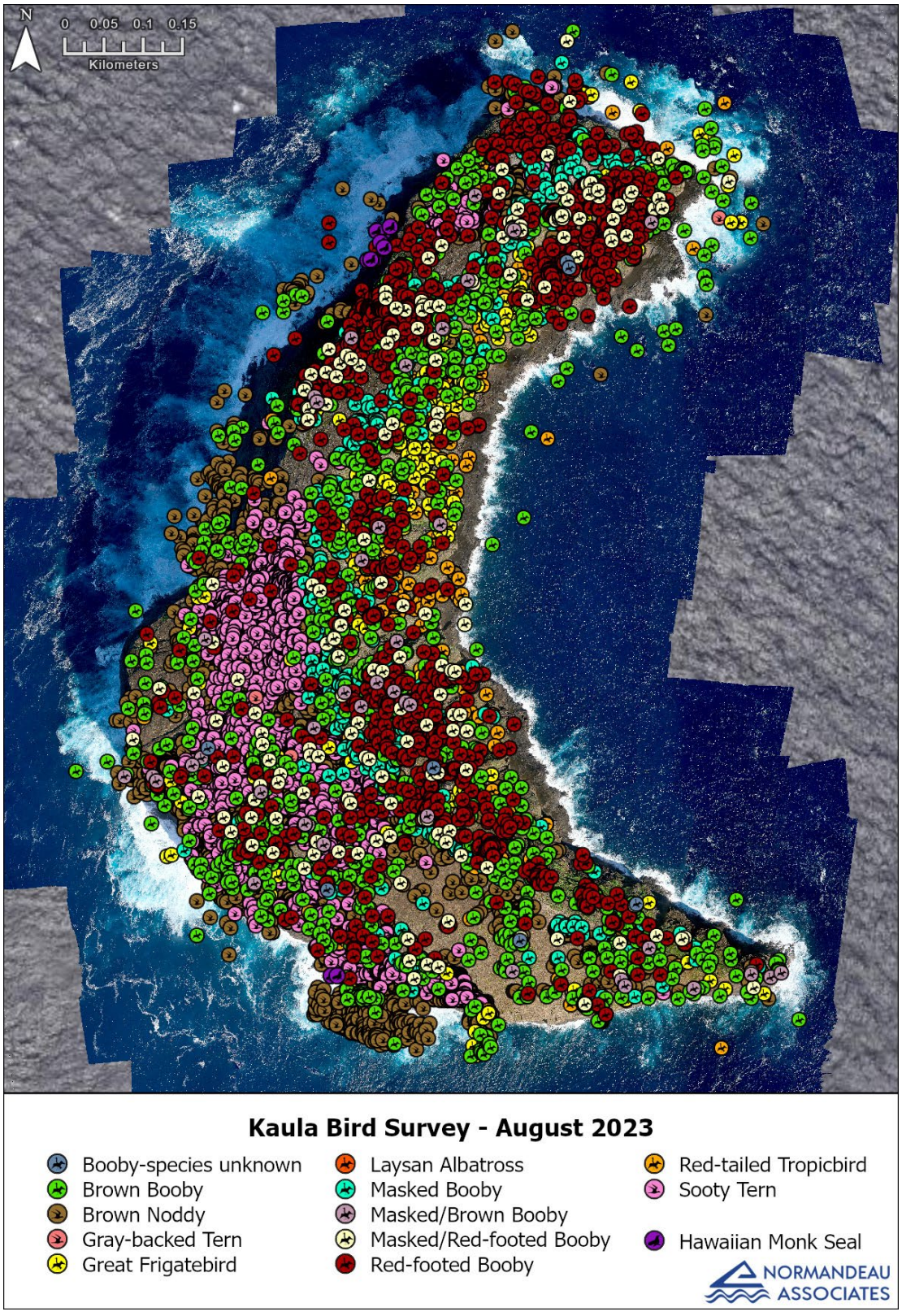


Figure E-21: Distribution of the Bird Species and Marine Mammals Recorded During the August 2023 Survey

Brown Booby

A total of 1,188 brown boobies were recorded during the survey, of which 243 were flying and 74 were either immature or juvenile birds in nests. They were widely distributed throughout the island. Of the total recorded, 88 were found in the oblique imagery and not visible in the vertical imagery.

Masked Booby/Brown Booby

A total of 42 unidentified masked/brown boobies were recorded during the survey, of which only 1 was identified in the oblique survey. Five were flying, 9 were immature, and 35 were on nests with no adults in attendance. They were present on both slopes of the island.

Red-footed Booby

A total of 1,369 red-footed boobies were recorded during the survey, all but 6 in the vertical survey, of which 415 were in flight. Out of the 1,369 birds, 69 were juveniles in nests. They were present across the island.

Masked Booby/Red-footed Booby

A total of 205 unidentified masked/red-footed boobies were recorded during the vertical survey and 23 in the oblique survey. Twenty-three were juvenile flying birds. Of the 288 unidentified boobies in this species group, 69 were juveniles on nests with no adults in attendance. They were present across the island.

Booby Species Unknown

Seven unidentified boobies were recorded during the vertical survey, two of which were flying. Of the seven unidentified boobies, four juveniles were on nests with no adults in attendance. Distribution was spotty.

Dead Birds

Ten fairly fresh dead birds representing six species were observed during the survey. They were brown noddy (n=1), sooty tern (n=1), red-tailed tropicbird (n=1), masked booby (n=1), brown booby (n=3), red-footed booby (n=2), and masked/red-footed booby (n=1). Distributions were spotty; however, none were recorded on the southern tip of the island (Figure E-22).

Marine Mammals

A total of 13 adult Hawaiian monk seals were recorded resting on ledges on the west side of the island.

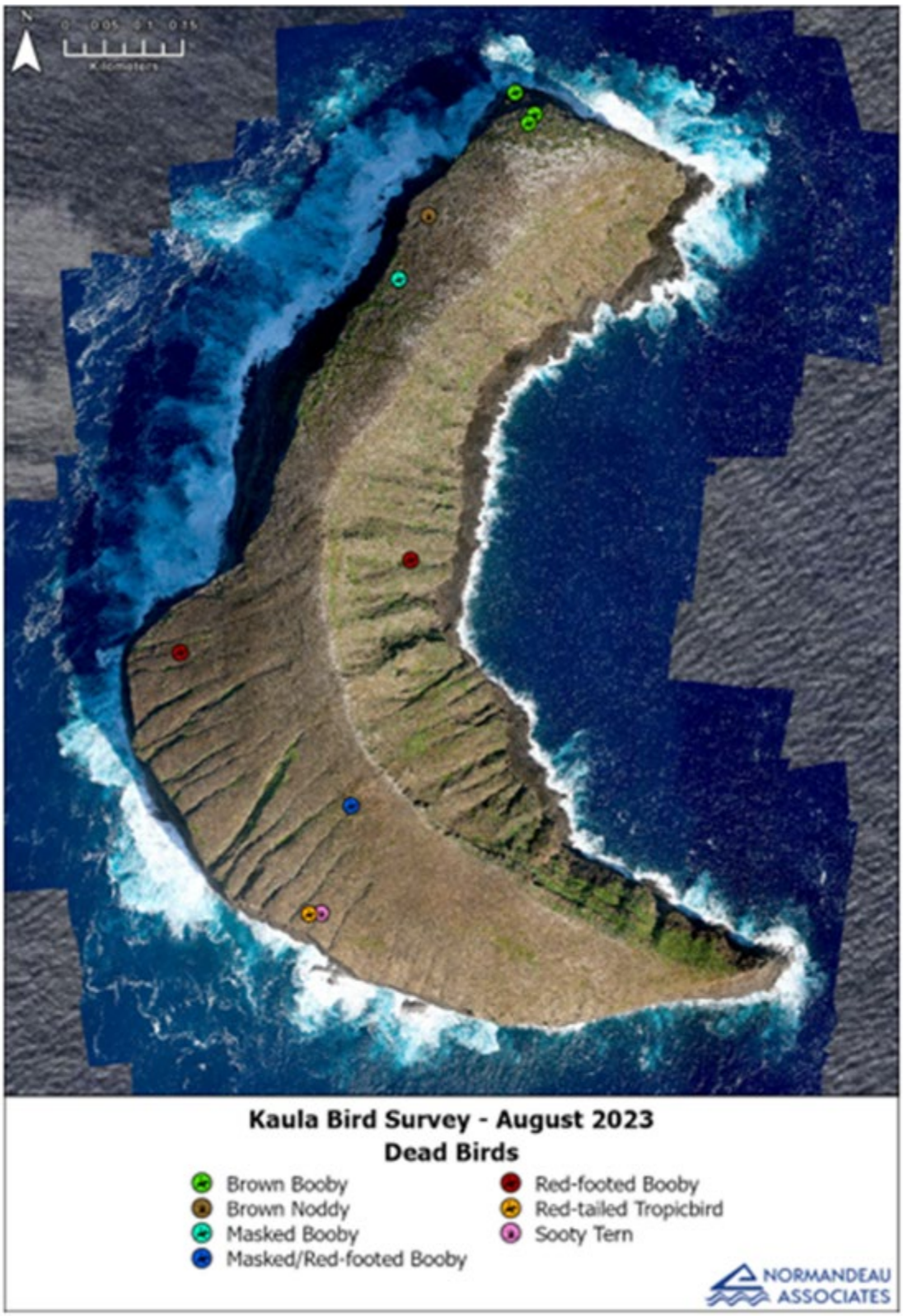


Figure E-22: Distribution of Dead Birds Recorded During the August 2023 Survey

Discussion

A total of 17,638 birds and 13 Hawaiian monk seals were recorded at Kaula Island during the survey (Table E-12). In general, relative abundance (most numerous to least numerous) is similar to previous survey results. The most abundant species was brown noddy, accounting for 63 percent (n=11,034) of all seabirds recorded. The next-most abundant species were sooty tern (n=2,440; 14 percent), red-footed booby (n=1,369; 8 percent), brown booby (n=1,188; 7 percent, and masked booby (n=739; 4 percent). Great frigatebird (n=377), red-tailed tropicbird (n=206), grey-backed tern (n=5), and Laysan albatross (n=3) were the least abundant species recorded.

The number of brown noddies recorded during the August 2023 survey were higher than numbers recorded in recent past aerial surveys. Numbers of sooty tern, red-trailed tropicbird, red-footed booby, brown booby were generally comparable to previous aerial surveys. Although not common, the number of grey-backed terns was generally comparable to what has been recorded in past surveys.

Lower numbers of great frigatebird and Laysan albatross were recorded in August 2023 than in previous surveys. Additionally, recorded numbers of masked booby were lower than recent years; as the three largest past counts of masked booby have occurred in either July, August or September on Kaula (Table E-13, Table E-14), this lower count could be the result of the extended bad weather pattern in 2023 affecting breeding success.

E.4 Summary of Results of Avian and Marine Mammal Surveys

Table E-13: Results of Land-Based and Boat-Based Bird Surveys Conducted on Kaula Island, Hawaii (1932–2012)

Common Name	Aug 1932 LBS* (A)	Aug 1971 LBS (A)	Jan 1976 LBS (A)	Sep 1976 LBS (A)	Mar 1978 LBS (A)	Aug 1978 LBS (A)	Mar 1979 LBS (A)	Jun 1980 LBS (A)	Apr 1984 LBS (A)	Jun 1993 LBS (A)	Nov 1998 LBS (A)	Jul 2009 BBS* (B)	Jun 2010 BBS (A)	Jun 2011 BBS (C)	July 2012 BBS (C)
Laysan albatross	-	1 old egg	150	-	100	-	100	9	33	44	60	-	-	-	-
Black-footed albatross	1 old egg	-	100	-	75	-	75	-	2	4	10	-	-	-	-
Bonin petrel	1 chick	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bulwer's petrel	several	100	-	100	-	50	-	100	580	100	-	1	1	-	-
Wedge-tailed shearwater	many burrows	4,100	-	4,000	-	800	-	1,415	980	400	200	16	-	-	-
Christmas shearwater	-	450	-	250	-	100	25	20	60	18	-	-	-	-	-
White-tailed tropicbird	-	3	1	1	-	1	2	-	-	-	1	-	-	-	-
Red-tailed tropicbird	common	950	-	450	60	100	40	276	209	146	15	31	3	5	1
Great frigatebird	common	950	250	800	400	250	250	134	155	701	650	131	430	105	26
Masked booby	common	1,000	300	1,200	125	200	400	236	202	567	350	-	-	-	-
Brown booby	common	1,700	50	1,000	75	60	200	212	169	397	60	112	1	6	40
Red-footed booby	uncommon	1,300	100	150	85	200	400	344	222	1,375	1,200	-	-	-	-
Masked/red-footed booby	-	-	-	-	-	-	-	-	-	-	-	820	850	1,859	912
Pacific golden plover	several	-	10	14	-	1	2	-	21	-	15	-	-	-	-
Wandering tattler	-	-	5	1	-	1	1	-	-	-	-	-	-	-	-
Ruddy turnstone	-	50	5	20	-	4	24	1	7	1	12	-	-	-	-

Common Name	Aug 1932 LBS* (A)	Aug 1971 LBS (A)	Jan 1976 LBS (A)	Sep 1976 LBS (A)	Mar 1978 LBS (A)	Aug 1978 LBS (A)	Mar 1979 LBS (A)	Jun 1980 LBS (A)	Apr 1984 LBS (A)	Jun 1993 LBS (A)	Nov 1998 LBS (A)	Jul 2009 BBS* (B)	Jun 2010 BBS (A)	Jun 2011 BBS (C)	July 2012 BBS (C)
Brown noddy	most numerous	67,700	-	7,000	7,000	10,000	1,000	10,560	3,950	5,778	-	-	-	-	-
Black noddy	-	100	20	100	75	200	-	-	207	6	-	-	-	-	-
Brown/black noddy	-	-	-	-	-	-	-	-	-	-	-	711	705	306	597
Blue-grey noddy	small colony	-	-	200	-	-	-	-	-	-	1	-	1	-	-
White tern	uncommon	10	10	200	40	10	-	9	12	9	-	10	9	9	12
Sooty tern	common	16,800	2,500	1,000	130,000	2,500	50,000	28,850	83,680	27,255	200	6,169	3,382	9,745	4,509
Grey-backed tern	uncommon	2,800	-	250	1,250	50	300	4,110	1,467	35	-	1	3	-	-
Barn owl	-	1	3	3	-	1	6	4	2	7	3	-	-	-	-
Japanese white-eye	-	-	2	3	-	-	-	-	-	3	-	-	-	-	-
Northern mockingbird	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-
Northern cardinal	-	2	-	7	-	-	-	-	-	-	-	-	-	-	-
Total Estimated Number of Birds	-	**98,022**	**3,521**	**16,811**	**139,285**	**14,548**	**52,831**	**46,280**	**91,959**	**36,847**	**2,785**	**8,001**	**5,385**	**12,035**	**6,097**
Total Estimated Number of Avian Species	**16**	**19**	**16**	**24**	**12**	**19**	**17**	**15**	**19**	**19**	**15**	**11**	**11**	**8**	**8**

*LBS = Land-Based Survey, BBS = Boat-Based Survey

A - (Richie & J. Fujimoto, 2011)

B – (Pepi et al., 2009)

C – (Fujimoto & Juola, 2012)

Table E-14: Results of Aerial Digital Surveys of Kaula Island, Hawaii (2013–2023)

Common Name	April 2013	August 2013	Jan 2014	Jan 2015	July 2015	March 2016	July 2017	Aug 2018	Nov 2019	Jul 2021	Aug 2023
Brown noddy	57	3,713	-	-	7,137	4,115	7,871	7,612	-	3,456	11,034
Black noddy	-	22	-	-	-	-	-	-	-	-	-
White tern	6	-	-	-	1	-	-	-	-	-	-
Sooty tern	14,635	7	-	-	147	40,814	768	6,535	-	2,523	2,440
Grey-backed tern	4	-	-	-	-	1	-	5	-	-	5
Red-tailed tropicbird	314	85	-	1	100	23	502	245	1	125	206
Laysan albatross	20	11	81	100	-	21	-	-	17	-	3
Black-footed albatross	3	-	11	3	-	4	-	-	-	-	-
Great frigatebird	1,415	1,369	621	748	1,078	1,005	777	719	316	1,375	377
Masked booby	550	219	65	84	526	183	514	1,312	217	1,262	739
Brown booby	101	109	3	2	867	179	969	1,231	185	1,573	1,188
Masked/brown booby	-	-	-	-	-		-	51	-	-	42
Red-footed booby	1,690	191	98	209	3,693	1,319	2,650	4,764	1,196	6,016	1,369
Masked/red-footed booby	-	-	-	-	27	-	24	-	-	-	228
Booby species	-	-	-	-	-	-	-	713	159	184	7
Hawaiian monk seal	11	7	5	7	8	10	8	7	8	10	13
Humpback whale	-	-	8	10	-	-	-	-	-	-	-
Total Estimated Number of Mammals	**11**	**7**	**13**	**17**	**8**	**10**	**8**	**7**	**8**	**10**	**13**
Total Estimated Number of Mammal Species	**1**	**1**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Total Estimated Number of Birds	**18,795**	**5,733**	**879**	**1,147**	**13,576**	**47,664**	**14,075**	**23,187**	**2,091**	**16,514**	**17,638**
Total Estimated Number of Avian Species	**11**	**9**	**6**	**7**	**8**	**10**	**8**	**9**	**7**	**9**	**10**

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