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## Hawaii Range Complex



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## Final Environmental Impact Statement/ Overseas Environmental Impact Statement (EIS/OEIS)

Executive Summary

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Final EIS/OEIS CD Included

May 2008

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# EXECUTIVE SUMMARY

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## ES1.1 INTRODUCTION

This Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) analyzes the potential environmental consequences that may result from the United States (U.S.) Department of the Navy's Proposed Action and alternatives. The Proposed Action presented in this EIS/OEIS addresses ongoing and proposed activities within the Navy's existing Hawaii Range Complex (HRC) and represents current and anticipated future use of the "existing footprint." This EIS/OEIS contains analysis of research, development, test, and evaluation (RDT&E) of new technologies used by the Navy and other Federal agencies, including the Missile Defense Agency.

This EIS/OEIS has been prepared by the Department of the Navy in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] § 4321 et seq.) and Executive Order (EO) 12114, *Environmental Effects Abroad of Major Federal Actions*.

The Navy is the lead for the EIS/OEIS; the National Marine Fisheries Service (NMFS), Missile Defense Agency, U.S. Department of the Army, and the U.S. Department of Energy are cooperating agencies. Additionally, the Navy has worked with experts from the State of Hawaii and other Federal agencies to ensure that the effects on the environment of the Navy's Proposed Action are fully assessed in this document.

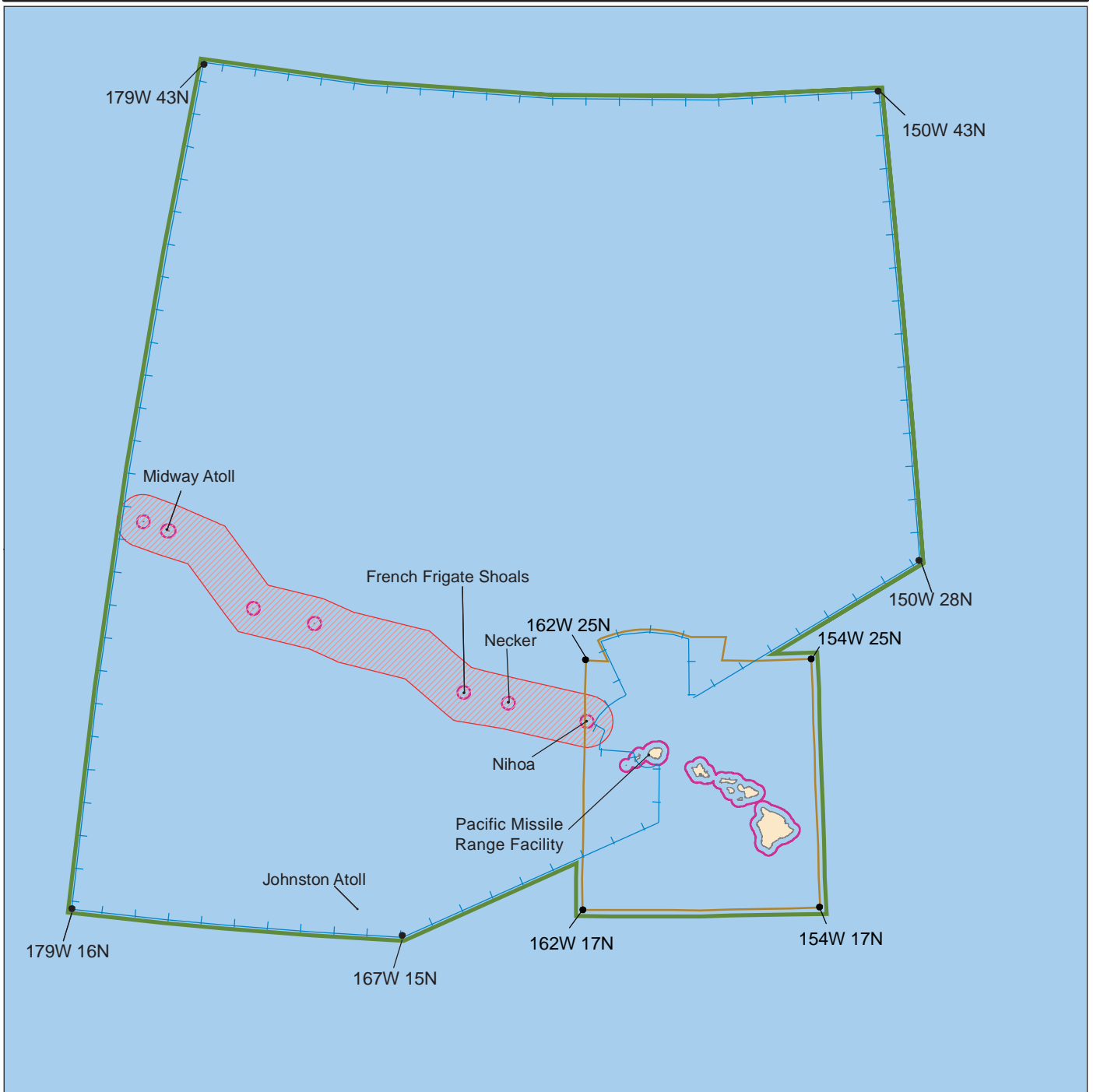
The HRC geographically encompasses the open ocean (outside 12 nautical miles [nm] from land), offshore waters (within 12 nm from land), and onshore areas located on or around the islands of the Hawaiian Islands chain (Figure ES-1).

There are three component areas of the HRC: (1) the Hawaii Operating Area (OPAREA) (includes surface and subsurface ocean areas and special use airspace); (2) the Temporary Operating Area (TOA) (composed of sea and airspace north and west of Kauai for RDT&E activities); and (3) various Navy land ranges and other Services' land for military training and RDT&E activities.







## ES1.2 PURPOSE AND NEED

The purpose of the Proposed Action is to achieve and maintain fleet readiness using the HRC to support and conduct current, emerging, and future training and RDT&E activities, and enhance training resources through investment on the ranges. The mission of the HRC is to support naval operational readiness by providing a realistic, live training environment for forces assigned to the Pacific Fleet, the Fleet Marine Force, and other users.

The need for the Proposed Action is to enable the Navy to meet its statutory responsibility under Title 10 Sections 5013 and 5062 to organize, train, equip, and maintain combat-ready naval forces and to successfully fulfill its current and future global mission of winning wars, deterring aggression, and maintaining freedom of the seas. Activities involving RDT&E for Department of Defense (DoD) or Navy systems are an integral part of this readiness mandate.



**EXPLANATION**

-  12-Nautical Mile Line
-  Temporary Operating Area (TOA)
-  Hawaii Operating Area (OPAREA)
-  Hawaii Range Complex (HRC)
-  Papahānaumokuākea Marine National Monument
-  Land



0 200 400 800 Nautical Miles

**EIS/OEIS Study Area:  
Hawaii Range Complex  
Including the Hawaii  
Operating Area and  
Temporary Operating  
Area**

Hawaiian Islands

**Figure ES-1**

The HRC plays a vital part in the execution of this naval readiness mandate. The Hawaii area is home to a large concentration of U.S. naval forces. Naval forces based in Hawaii and those transiting across the Pacific Ocean use and rely on the HRC because of its capabilities and strategic location in the mid-Pacific region. The Navy's Proposed Action is essential to ensure the continued vitality of this training resource.

### **ES1.2.1 WHY THE NAVY TRAINS**

The U.S. military is maintained to ensure the freedom and safety of all Americans both at home and abroad. In order to do so, Title 10 of the U.S.C requires the Navy to "maintain, train and equip combat-ready naval forces capable of winning wars, deterring aggression and maintaining freedom of the seas." Modern war and security operations are complex. Modern weaponry has brought both unprecedented opportunity and innumerable challenges to the Navy. Smart weapons, used properly, are accurate and allow the Navy to accomplish its mission with greater precision and less destruction than in past conflicts. U.S. military personnel must train regularly with these modern, complex weapons in order to understand their capabilities, limitations, and operation. Modern military actions require teamwork between hundreds or thousands of people, and their various equipment, vehicles, ships, and aircraft, all working individually and as a coordinated unit to achieve success. Navy training addresses all aspects of the team, from the individual to joint and coalition teamwork. To do this, the Navy employs a building-block approach to training. Training doctrine and procedures are based on operational requirements for deployment of naval forces. Training proceeds on a continuum, from teaching basic and specialized individual military skills, to intermediate skills or small unit training, to advanced, integrated training events, culminating in multi-service (Joint) exercises, coalition or combined exercises (with allied nations participating), or pre-deployment certification events.

In order to provide the experience so important to success and survival, training must be as realistic as possible. The Navy often employs simulators and synthetic training to provide early skill repetition and to enhance teamwork, but live training in a realistic environment is vital to success. Live training requires sufficient sea and airspace to maneuver tactically, realistic targets and objectives, simulated opposition that creates a realistic enemy, and instrumentation that monitors the events and provides essential feedback.

Range complexes, like the HRC, provide a controlled and safe environment with threat-representative targets that allow Navy forces to conduct realistic training as Navy men and women undergo all phases of the graduated buildup needed for combat-ready deployment. The range complexes are designed to provide the most realistic training in the most relevant environments, replicating to the greatest extent possible the operational stresses of warfare. The integration of undersea ranges and OPAREAs with land training ranges, safety landing fields, and amphibious landing sites are critical to this realism, allowing execution of multi-dimensional exercises in complex scenarios. The live-fire phase of training is fundamental to the adequate assessment of weapon precision under stressful conditions. Live training, most of it accomplished in the waters off the United States' coasts, will remain the cornerstone of readiness as the Navy prepares its military forces for a security environment characterized by uncertainty and surprise.

## **ES1.2.2 STRATEGIC IMPORTANCE OF THE EXISTING HAWAII RANGE COMPLEX**

The HRC is used for training and assessment of operational forces, missile training, RDT&E of military systems and equipment, and other military activities. The HRC is characterized by a unique combination of attributes that make it a strategically important range complex for the Navy. These attributes include:

- Proximity to the homeport of Pearl Harbor
- Proximity to the Western Pacific
- Proximity to military families based in Hawaii
- New training terrain for west coast based naval forces

Refer to Section 1.3.5 of Chapter 1.0 for a detailed description of these attributes.

The large training area available to deployed forces within the HRC allows training to take place using a geographic scope that replicates possible real world events, with the channels between islands providing geography necessary for opposed transit scenarios. The presence of the instrumented tracking ranges at the Pacific Missile Range Facility (PMRF) as well as DoD-controlled warning areas and special use airspace also allow safe and structured training with sufficient flexibility to interject tactical challenges to enhance realism for exercise participants. Exercise participants at sea can conduct air strike sorties to Pohakuloa Training Area (PTA) and an Expeditionary Strike Group (ESG) can conduct amphibious landing on DoD beaches, while each simultaneously conducts Anti-Submarine Warfare (ASW) training. Finally, the presence of submarines homeported at Pearl Harbor allows for a readily available opposition force during the training event without having to transit to participate in the exercise events.

## **ES1.3 SCOPE AND CONTENT OF THE EIS/OEIS**

The Navy's analysis of environmental effects under NEPA includes areas of the HRC that lie within the territorial seas, which extend 12 nm from land. The environmental effects in the ocean areas that are outside of U.S. territorial seas are analyzed under EO 12114 and associated implementing regulations.

### **ES1.3.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)**

In 1969, Congress enacted NEPA, which provides for the consideration of environmental issues in Federal agency planning and decision-making. Regulations for Federal agency implementation of the act were established by the President's Council on Environmental Quality (CEQ). NEPA requires that Federal agencies prepare an EIS if the agency's proposed action might significantly affect the quality of the human environment. The EIS must disclose significant environmental impacts and inform decision makers and the public of the reasonable alternatives to the proposed action. Presidential Proclamation 5928, issued December 27, 1988, extended the exercise of United States sovereignty and jurisdiction under international law to 12 nm; however, the Proclamation expressly provides that it does not extend or otherwise alter existing Federal law or any associated jurisdiction, rights, legal interests, or obligations.

However, as a matter of policy, the Navy analyzes environmental effects and actions within 12 nm under NEPA and those effects occurring beyond 12 nm under the provisions of EO 12114.

This EIS/OEIS provides an assessment of the potential environmental impacts associated with sustainable range usage and enhancements within the Navy's HRC. The Navy completed the Supplement to the 2002 Rim of the Pacific (RIMPAC) Programmatic Environmental Assessment in May 2006 and the Undersea Warfare Exercise (USWEX) Programmatic Environmental Assessment in October 2007. This EIS/OEIS analyzes the continuation of these exercises in the baseline analysis. It also analyzes Navy training that currently occurs or is proposed to occur in open ocean, offshore, and onshore areas of the HRC.

The first step in the NEPA process is the publication of a Notice of Intent (NOI) to prepare an EIS. The NOI provides an overview of the proposed action and the scope of the EIS. The NOI for this project was published in the *Federal Register* on August 29, 2006, and in five local newspapers (i.e., *Honolulu Advertiser*, the *Honolulu Star Bulletin*, the *Maui News*, the *Hawaii Tribune Herald*, and the *Garden Island*) on September 2, 4, and 5, 2006.

Scoping is an early and open process for developing the "scope" of issues to be addressed in the EIS and for identifying significant issues related to a proposed action. During scoping, the public helps define and prioritize issues and convey these issues to the agency through both oral and written comments. The scoping period for the HRC EIS/OEIS began with the publication of an NOI. The scoping period lasted 46 days, concluding on October 13, 2006. Four scoping meetings were held on September 13, 14, 16, and 18, 2006 on the islands of Maui, Oahu, Hawaii, and Kauai, respectively. The scoping meetings were held in an open house format, presenting informational posters and written information, and making Navy staff and project experts available to answer participants' questions. Additionally, a court reporter was available to record participants' oral comments. This format allowed the public to interact informally, one-on-one, with project representatives or comment formally, on the record, to representatives of the Navy.

In addition to the scoping meetings, the public could make comments through a toll-free telephone number, by sending an email, or by mailing a written comment. Issues identified by the public were provided to resource specialists working on the EIS/OEIS to ensure that all comments were considered during the preparation of the document.

After scoping, the Draft EIS/OEIS was prepared to provide an assessment of the potential impacts of the Proposed Action and alternatives on the environment. Public hearings were conducted during the review process in Kauai (Lihue), Oahu (Honolulu), Maui (Wailuku), and Hawaii (Hilo). The Draft EIS/OEIS was circulated for public review and the comment period concluded on September 17, 2007. Approximately 2,500 public comments were received and appropriately incorporated into this EIS/OEIS. Responses to public comments on the Draft EIS/OEIS may be found in Chapter 13.0.

During the scoping and public review process, members of the public and non-governmental environmental organizations expressed concerns on a variety of topics. One of the issues receiving the most comments related to the potential effects associated with mid-frequency active (MFA) sonar use and testing in the HRC. These concerns are addressed in this EIS/OEIS.

The Navy recognizes that the potential impact on marine mammals caused by the use of sonar is controversial. Based on continued coordination with NMFS, the Navy has used best available science as the basis to assess impacts on marine mammals caused by MFA and high-frequency active (HFA) sonar used by a particular torpedo. The best available science has been used as a basis for development of the "Risk Function" model for predicting potential exposures of marine mammals to Navy MFA and HFA sonar use that will result in behavioral effects. What this model cannot do yet is to include in its calculations reductions in the behavioral effects estimates resulting from all of the procedures that the Navy has in place to protect marine mammals. These include personnel training, pre- and post-exercise surveys, power-down and power-off requirements for the sonar when mammals are within certain distances of the sound source, and passive detection of marine mammals.

During the public hearings, it was clear that many of those voicing concern were unaware that the training and testing activities proposed for the HRC are not new activities and have been occurring for approximately 40 years. No known marine mammal strandings directly related to Navy activities have occurred during this time. Nonetheless, by design, the Navy has taken an approach to modeling that calculates the maximum potential exposures to marine mammals to account for uncertainties in existing scientific data.

Since the publication of the Draft EIS/OEIS, the Navy, in coordination with the NMFS, re-analyzed the effects that MFA sonar has on marine mammals. This re-evaluation and consequent proposed changes to the Draft EIS/OEIS led the Navy to prepare a Supplement to the Draft EIS/OEIS. Accordingly, this EIS/OEIS incorporates the following changes and associated environmental analysis as presented in the Supplement to the Draft EIS/OEIS:

- Modifications to the analytical methodology used to evaluate the effects of MFA sonar on marine mammals;
- Changes to the amount and types of sonar allocated to each of the alternatives; and,
- The development of a new alternative.

The NOI for the Supplement to the Draft EIS/OEIS was published in the *Federal Register* on January 17, 2008. The Supplement to the Draft EIS/OEIS was circulated for public review, and the comment period ended on April 7, 2008. Responses to all comments on the Supplement to the Draft EIS/OEIS are presented in Chapter 14.0 of this document.

There is a 30-day wait period following the publication of the Notice of Availability of the Final EIS/OEIS in the Federal Register. At the conclusion of this wait period, the Navy will decide the action it will implement through its Record of Decision (ROD) which will be published in the Federal Register. The ROD will summarize the final decision and identify the selected alternative, describe the public involvement and agency decision-making processes, and present commitments to specific mitigation measures. The selected decision can then be implemented.



### **ES1.3.2 EXECUTIVE ORDER (EO 12114)**

Environmental effects in the areas that are beyond the U.S. territorial sea are analyzed under EO 12114 and associated implementing regulations.

### **ES1.3.3 MARINE MAMMAL PROTECTION ACT, ENDANGERED SPECIES ACT COMPLIANCE**

The Marine Mammal Protection Act (MMPA) of 1972 established, with limited exceptions, a moratorium on the “taking” of marine mammals in waters or on lands under U.S. jurisdiction. Section 101(a)(5) of the MMPA directs the Secretary of Commerce to allow, upon request, the incidental, but not intentional, taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing). In support of the Proposed Action, the Navy applied for a Letter of Authorization from NMFS pursuant to Section 101(a) (5) (A) of the MMPA. NMFS intends to publish a proposed rule for public comment coincident with the publication of this EIS/OEIS, and anticipates issuing the final authorization toward the end of Calendar Year 2008.

On January 23, 2007, the Deputy Secretary of Defense exempted all military readiness activities employing MFA sonar or Improved Extended Echo Ranging (IEER) sonobuoys from compliance with the requirements of the MMPA for a period of 2 years. This exemption is limited to Major Exercises or training and RDT&E activities within established operating areas or established DoD maritime ranges. This National Defense Exemption (NDE) remains in effect until January 23, 2009 or authorization under the MMPA, whichever is earliest.

The NDE will cover MFA sonar and IEER sonobuoy activities on the HRC until an MMPA authorization is issued for these activities or the NDE expires whichever is earliest. While the NDE remains applicable (until an MMPA authorization is issued), the Navy will continue to employ the marine mammal mitigation measures outlined in Chapter 6.0 of this EIS/OEIS to protect marine mammals while training with the use of MFA sonar. These measures include safety zones around ships and trained lookouts based on coordination of science-based measures with NMFS. Additional measures that may be required as a result of the MMPA authorization would be implemented once authorization is received.

The Endangered Species Act (ESA) requires that Federal agencies, in consultation with the responsible wildlife agency, ensure that proposed actions are not likely to jeopardize the continued existence of any endangered species or threatened species, or result in the destruction or adverse modification of a critical habitat. Regulations implementing the ESA consultation requirement also include those actions that “may affect” a listed species or adversely modify critical habitat.

As part of the environmental documentation for this EIS/OEIS, and as an MMPA permit applicant, the Navy entered into early consultation procedures with NMFS, endangered species division. The Navy has been actively engaged in consultation with NMFS regarding the potential effects on ESA-listed species from the conduct of the activities outlined in this EIS/OEIS. In accordance with 50 Code of Federal Regulations (CFR) §402.11, prior to the issuance of the ROD, NMFS will issue a Preliminary Biological Opinion documenting its determination as to whether the activities conducted in the HRC are likely to jeopardize the

continued existence of ESA-listed species, or result in the destruction or adverse modification of critical habitat. Additionally, a preliminary Incidental Take Statement will accompany the preliminary Biological Opinion. Because the Section 7 consultation is simultaneously conducted internally to address NMFS' issuance of an MMPA authorization, an Incidental Take Statement for marine mammals cannot be issued until an MMPA authorization is issued.

The Preliminary Biological Opinion and Preliminary Incidental Take Statement do not exempt the Navy from the prohibitions of Section 9 of the ESA. Further, the Navy has determined that activities occurring in the HRC prior to the issuance of an MMPA authorization (e.g., RIMPAC, USWEX, etc.) may affect endangered species in the HRC, and may incidentally take ESA-listed species, thus requiring consultation under the ESA and an associated Incidental Take Statement. As such, the Navy and NMFS are engaged in a separate Section 7 consultation on these specified activities. A separate Biological Opinion and Incidental Take Statement will be issued, as appropriate, for this subset of specified activities, which will occur prior to the issuance of the MMPA authorization and be covered by the NDE.

#### **ES1.3.4 OTHER ENVIRONMENTAL REQUIREMENTS CONSIDERED**

The Navy must comply with a variety of other Federal environmental laws, regulations, and EOs. These include (among other applicable laws and regulations):

- Migratory Bird Treaty Act;
- Coastal Zone Management Act;
- Rivers and Harbors Act;
- Magnuson-Stevens Fishery Conservation and Management Act;
- Clean Air Act;
- Federal Water Pollution Control Act (Clean Water Act);
- National Historic Preservation Act;
- EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- EO 13045, Environmental Health and Safety Risks to Children;
- EO 13423, *Strengthening Federal Environmental, Energy and Transportation Management*;
- EO 13089, *Coral Reef Protection*; and
- National Marine Sanctuaries Act.

In addition, laws and regulations of the State of Hawaii appropriate to Navy actions are identified and addressed in this EIS/OEIS. To the extent practicable, this document will be used as the basis for any required consultation and coordination.

## **ES1.4 PROPOSED ACTION AND ALTERNATIVES**

The Proposed Action presented in this EIS/OEIS addresses ongoing and proposed activities within the Navy's existing HRC and contains analyses of RDT&E of new technologies used by the Navy and other Federal agencies.

### **ES1.4.1 ALTERNATIVES DEVELOPMENT**

NEPA requires that an EIS evaluate the environmental consequences of a range of reasonable alternatives. Guidance for the development of alternatives is provided in CEQ regulations (40 CFR § 1502.14) and Navy procedures described in 32 CFR § 775. Reasonable alternatives must meet the stated purpose and need of the Proposed Action.

### **ES1.4.2 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION**

The Navy eliminated alternatives from further consideration. Specifically, the following alternatives (described in Chapter 2.0) were not carried forward for analysis:

- Reduction or Elimination of Training in the Hawaii Range Complex
- Alternative Locations for Training Conducted in the Hawaii Range Complex
- Computer Simulation Training

After careful consideration, none of these alternatives meet the Navy's purpose and need for the Proposed Action.

### **ES1.4.3 ALTERNATIVES CONSIDERED**

Alternatives were selected based on their ability to meet the following criteria, which were developed from the purpose and need for the Proposed Action: (1) use existing Navy ranges and facilities in and around Hawaii; (2) be consistent with the stated current and emerging requirements for the range complex; (3) achieve training tempo requirements based on Fleet deployment schedules; (4) meet the requirements of DoD Directive 3200.15, Sustainment of Ranges and Operating Areas; (5) implement new training requirements and RDT&E activities; and (6) support realistic training that replicates expected operating environments for naval forces. Four alternatives are analyzed in the EIS/OEIS, including three action alternatives (Alternatives 1, 2, and 3) and the No-action Alternative.

#### **ES1.4.3.1 No-Action Alternative**

The No-action Alternative is required by CEQ regulations as a baseline against which the impacts of the Proposed Action are compared. In the EIS/OEIS, the No-action Alternative is represented by baseline training and RDT&E operations at current levels, including more than 9,300 training and RDT&E activities in the HRC annually. Training events, including those that make up Major Exercises (RIMPAC Exercise and five USWEXs) and RDT&E activities, would continue at the baseline levels. Ongoing training events include Anti-Air Warfare, Amphibious Warfare, Anti-Surface Warfare, ASW, Electronic Combat, Mine Warfare, Naval Special Warfare, and Strike Warfare Exercises. The No-action Alternative includes support activities such as

Command and Control, in-port ship and aircraft support, and personnel support. RDT&E activities occur primarily at one of two locations in Hawaii: PMRF and Naval Undersea Warfare Center Detachment Pacific ranges.

#### **ES1.4.3.2 Alternative 1**

Alternative 1 includes all ongoing Navy training associated with the No-action Alternative, and proposes an increased number of such training events. The Navy proposes to increase both the tempo and the frequency of training exercises in the HRC. Alternative 1 includes the addition of Field Carrier Landing Practice (FCLP), a series of touch-and-go landings to train and qualify pilots for aircraft carrier landings at PMRF airfield on Kauai and Marine Corps Base Hawaii (MCBH) on Oahu. The Navy proposes to enhance and add RDT&E activities above current levels.

#### **ES1.4.3.3 Alternative 2**

Alternative 2 would include all of the activities described in Alternative 1, plus a further increased tempo and frequency of training events, future RDT&E programs at PMRF, and the addition of Major Exercises, such as supporting three Carrier Strike Groups training at the same time.

#### **ES1.4.3.4 Alternative 3 (Preferred Alternative)**

The only difference between Alternative 2 and Alternative 3 is the amount of MFA/HFA sonar usage. Alternative 3 would include all of the training associated with Alternative 2. As described under Alternative 2, Alternative 3 would provide increased flexibility in training activities by increasing the tempo and frequency of training events, future and enhanced RDT&E activities, and the addition of Major Exercises. Alternative 3 would consist of sonar usage as analyzed under the No-action Alternative. Sonar hours for Alternative 3 and effects associated with ASW training would be identical to that presented under the No-action Alternative.

Alternative 3 is the preferred alternative because it allows the Navy to meet its future non-ASW training and RDT&E mission objectives while maintaining historic levels of ASW training to avoid increases in potential effects to marine mammals in the HRC. At this time, the Navy believes that its ASW requirements will be met based on the No-action Alternative sonar hours.

### **ES1.5 SPORTS DATA**

The data from the Sonar Positional Reporting System (SPORTS) provided a foundation for the sonar hours analyzed under each of the Alternatives. SPORTS is a database tool established by Commander, U.S. Fleet Forces Command in mid-2006. All commands employing MFA sonar and sonobuoys are required to populate the SPORTS database by reporting MFA sonar use. A review by senior officers determined that SPORTS data would be used in this EIS/OEIS in conjunction with previous planning data to assist in determining the amount of MFA sonar use for purposes of modeling potential effects on marine mammals.

The types of sonar sources used as part of ASW activities within the HRC are listed below:

- Surface ship sonar (AN/SQS-53 and AN/SQS-56)
- Helicopter dipping sonar (AN/AQS-22)
- Aircraft deployed sonobuoys (AN/SSQ-62)
- Submarine sonar (BQQ-10, BQQ-5, BSY-1)
- MK-48 torpedo

Table ES-1 presents a comparison of the sonar used for each of the alternatives analyzed. The majority of training and RDT&E activities in the HRC involve five types of narrowband sonars. Exposure estimates are calculated for each sonar according to the manner in which it operates. For example, the AN/SQS 53 and AN/SQS 56 are hull-mounted, MFA surface ship sonars that operate for many hours at a time (although sound is output—the “active” portion—only a small fraction of that time), so it is most useful to calculate and report surface ship sonar exposures per hour of operation. The BQQ-10 submarine sonar is also reported per hour of operation. However, the submarine sonar is modeled as pinging only twice per hour. The AN/AQS-22 is a helicopter-deployed sonar, which is lowered into the water, pings several times, and then moves to a new location; this sonar is used for localization and tracking a suspected contact as opposed to searching for contacts. For the AN/AQS-22, it is most helpful to calculate and report exposures per dip. The AN/SSQ-62 is a sonobuoy that is dropped into the water from an aircraft or helicopter and pings about 10 to 30 times in an hour. For the AN/SSQ-62, it is most helpful to calculate and report exposures per sonobuoy. For the MK-48 torpedo the sonar is modeled for a typical training event and the MK-48 reporting metric is the number of torpedo runs. See Table J-2 of Appendix J for a presentation of the deployment platform, frequency class, the metric for reporting exposures, and the units for each sonar.

Note that sonar usage for Alternative 3 and effects associated with ASW training would be identical to that presented under the No-action Alternative.

**Table ES-1. Summary of Sonar Usage for Each Alternative**

<b>No-action Totals</b>		
	<b>Source</b>	<b>Modeled</b>
	53	1,284 hours
	56	383 hours
	Dipping	1,010 dips
	Sonobuoy	2,423 buoys
	MK-48	313 runs
	Submarine	200 hours
<b>Alternative 1 Totals</b>		
	<b>Source</b>	<b>Modeled</b>
	53	1,788 hours
	56	551 hours
	Dipping	1,517 dips
	Sonobuoy	3,127 buoys
	MK-48	317 runs
	Submarine	200 hours

**Table ES-1. Summary of Sonar Usage for Each Alternative (Continued)**

<b>Alternative 2 Totals</b>	
<b>Source</b>	<b>Modeled</b>
53	2,496 hours
56	787 hours
Dipping	1,763 dips
Sonobuoy	3,528 buoys
MK-48	374 runs
Submarine	200 hours
<b>Alternative 3 Totals</b>	
<b>Source</b>	<b>Modeled</b>
53	1,284 hours
56	383 hours
Dipping	1,010 dips
Sonobuoy	2,423 buoys
MK-48	313 runs
Submarine	200 hours

## **ES1.6 SUMMARY OF ENVIRONMENTAL EFFECTS**

Environmental effects which might result from the implementation of the Navy's Proposed Action or alternatives have been analyzed in this EIS/OEIS. Resource areas analyzed included airspace, biological resources, cultural resources, hazardous materials and waste, health and safety, noise, water resources, geology and soils, land use, socioeconomics, transportation, and utilities. A summary of effects on the above-referenced resources where applicable have been addressed in Table ES-2 for Open Ocean areas, Table ES-3 for the Northwestern Hawaiian Islands, Tables ES-4 for Kauai, Tables ES-5 for Oahu, Table ES-6 for Maui, and Table for ES-7 for Hawaii. A detailed analysis of effects is provided in Chapter 4.0.

A comparison of the environmental impacts of the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 is presented in Tables ES-2 through ES-7. These tables summarize the conclusions of the analyses made for each of the areas of environmental consideration based on the application of the described methodology. Only those activities for which a potential environmental concern was determined at each location are described for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3.

### **ES1.6.1 CUMULATIVE IMPACTS**

The analysis of cumulative impacts considers the effects of the Proposed Action in combination with other past, present, and reasonably foreseeable future actions taking place in the project area, regardless of what agency or person undertakes these actions. This EIS/OEIS analyzes cumulative impacts associated with implementation of Navy-sponsored activities and other non-Navy activities in the region. The cumulative project list includes over 140 Federal, State, and local projects ranging from minor construction to major infrastructure type projects, as well as various military training projects. Other activities included Commercial Fishing, Commercial and Recreational Vessel Traffic, Coastal Development Activities, Environmental Contamination and

Biotoxins, and Scientific Research Permits. Potential cumulative impacts resulting from other relevant projects (such as those listed above) combined with the Proposed Action addressed in this EIS/OEIS were determined to be less than significant.

## **ES1.6.2 MITIGATION MEASURES**

The Navy is a global environmental leader. As part of the Navy's commitment to sustainable use of resources and environmental stewardship, the Navy incorporates mitigation measures that are protective of the environment into all of its activities. The Navy's current mitigation measures reflect a balance between training requirements and the Navy's important role in ensuring environmental protection. These measures have been the subject of extensive discussions between NMFS and the Navy, and evaluated for mission impacts, probable effectiveness, and the ability to implement. Mitigation measures are described in detail in Chapter 6.0.

Mitigation measures identified to reduce effects or ensure no future impacts occur are provided in Table ES-8.

## **ES1.6.3 OTHER NEPA CONSIDERATIONS**

### **ES1.6.3.1 Conflicts with Federal, State, and Local Land Use Plans, Policies, and Controls for the Area Concerned**

Based on an evaluation of consistency with statutory obligations, the Navy's proposed training and RDT&E activities for the HRC do not conflict with the objectives or requirements of Federal, State, regional, or local plans, policies, or legal requirements. The proposed training and RDT&E activities would not alter the use of the sites that currently support missile testing. Enhancement of the HRC would be in accordance with applicable Federal, State, and local planning plans and policies. The DoD maintains Federal jurisdiction for on-installation land use.

### **ES1.6.3.2 Energy Requirements and Conservation Potential**

The proposed training and RDT&E activities include increased training events in the HRC. In order to implement the proposed training and RDT&E activities, increased amounts of fossil fuels would be required to power the increased use by ships and aircraft. These fuels are currently in adequate supply from either Navy owned sources or from commercial distributors. The required electricity demands would be met by the existing electrical generation infrastructure on the Hawaiian Islands. Anticipated energy requirements of the continued use and enhancement of the HRC would be well within the energy supply capacity of all facilities. Energy requirements would be subject to any established energy conservation practices at each facility. No additional power generation capacity other than the potential use of generators would be required for any of the training and RDT&E activities. The use of energy sources has been minimized wherever possible without compromising safety, training, or testing events. No additional conservation measures related to direct energy consumption by the proposed training and RDT&E activities are identified.

**ES1.6.3.3 Irreversible or Irretrievable Commitment of Resources**

The proposed training and RDT&E activities would have an irreversible or irretrievable effect due to the use of nonrenewable energy sources: hydrocarbon fuels for aircraft, vessels, and vehicles. However, among the alternative training scenarios there are no significant differences in the cost of fuel and the climatic consequences of large-scale combustion of hydrocarbon fuel. Implementation of the proposed training and RDT&E activities would not result in the destruction of environmental resources so as to cause the potential uses of the environment of the HRC to be limited. The proposed training and RDT&E activities would not adversely affect the biodiversity or cultural integrity within the HRC including the open ocean, offshore, onshore, or human environment.

**ES1.6.3.4 Relationship Between Short-Term Environmental Impact and Long-Term Productivity**

The Navy is committed to sustainable range management. Effective, sustainable range management addresses both short- and long-term effects on the human environment and strives to ensure the long-term productivity and availability of vital range training resources. The Navy is committed to the co-use of the HRC and surrounding areas with the general public and, for the open ocean areas, international community. This commitment to co-use is incorporated in the Navy's long-term range management and will enhance the long-term productivity of the range and surrounding areas for the public and commercial interests.



**Table ES-2. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Open Ocean**

Resource Category	Open Ocean
Airspace	<p><b>No-action:</b> No airspace impacts were identified in the analysis presented in Chapter 4.0. Any potential impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, compliance with Department of Defense (DoD) Directive 4540.1, Office of the Chief of Naval Operations Instruction (OPNAVINST) 3770.4A, OPNAVINST 3721.20, and continued close coordination with the Federal Aviation Administration (FAA). No modifications or need for additional airspace are required.</p> <p><b>Alternative 1:</b> No airspace impacts were identified in the analysis presented in Chapter 4.0. Any potential impacts on airspace from increased training activities, increased research, development, test, and operation (RDT&amp;E) activities, planned test and evaluation activities, Hawaii Range Complex (HRC) enhancements, and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> No airspace impacts were identified in the analysis presented in Chapters 4.0. Any potential impacts on airspace from increases in training activities, additional RDT&amp;E activities, and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Biological Resources (Open Ocean)	<p><b>No-action:</b> The modeling quantification of exposures to marine mammals from operation of MFA/HFA sonar and underwater detonations does not predict any marine mammal mortalities. Modeling quantification does not predict any marine mammal exposed to sonar or explosives in excess of the onset of permanent threshold shift; there are no exposures indicative of Level A injury. Modeling does predict TTS and sub-TTS Level B harassments of marine mammals, however, the results from this modeling are presented without consideration of mitigation measures employed per Navy standard operating procedures. The likelihood that many marine mammals can be readily detected, standard mitigation measures involving range clearance procedures should reduce the number of these exposures. There will be no impacts to sea turtles. To reiterate, based on the history of Navy activities in the HRC, and analysis in this document, military readiness activities are not expected to result in any Level A injury or mortalities to marine mammals. However, given the frequency of naturally occurring marine mammal strandings in Hawaii (e.g. natural mortality), it is conceivable that a stranding could co-occur within the timeframe of a Navy exercise even though the stranding may be unrelated to Navy activities. Based on NMFS' recommendation that Navy consider scientific uncertainty and potential for mortality, the Navy is requesting 20 serious injury or mortality takes for 7 commonly-stranded, non ESA-listed species and 3 species of beaked whales present within the HRC (2 mortality takes per species). These are bottlenose dolphin, Kogia spp., melon-headed whale, pantropical spotted dolphin, pygmy killer whale, short-finned pilot whale, striped dolphin, Cuvier's beaked whale, Longman's beaked whale, and Blainville's beaked whale</p> <p><b>Alternative 1:</b> Any anticipated or potential impacts on biological resources from increased training activities, RDT&amp;E activities, and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any anticipated impacts on biological resources from additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Biological Resources (Open Ocean) impacts would be the same as those described under the No-action Alternative. Chapters 4.0 and 5.0 discuss Open Ocean and Offshore impacts in detail. Appendix J provides details on the acoustic modeling approach.</p>
Cultural Resources	<p><b>No-action:</b> Cultural resources that occur in the Open Ocean Area are generally deeply submerged and inherently protected from the effect of all types of activity. Both the probability of encountering submerged resources and the probability of causing adverse effect on those resources are extremely low regardless of the action alternative being considered. To even further lower the probability of effect, areas where known submerged cultural resources exist will be avoided for operational activities involving expended material, debris dispersion, or underwater detonation. Procedures are in place to minimize any effects on underwater cultural resources. In accordance with Section 106 of the National Historic Preservation Act (36 CFR Part 800), cultural resources mitigation measures as described in various sections of Chapter 4.0 would be implemented.</p> <p><b>Alternative 1:</b> Impacts on cultural resources from increased training activities, RDT&amp;E activities, and Major Exercises (e.g., RIMPAC) would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on cultural resources from additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapters 4.0 and 5.0 discuss Open Ocean and Offshore impacts in detail.</p>

**Table ES-2. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Open Ocean (Continued)**

Resource Category	Open Ocean
Hazardous Materials and Waste	<p><b>No-action:</b> Implementation of the No-action Alternative would not result in significant impacts associated with the use of hazardous materials. The Navy has appropriate plans in place to manage hazardous materials used and generated. Hazardous materials will continue to be controlled in compliance with OPNAVINST 5090.1B. Fragments of expended training materials, e.g. ammunition, bombs and missiles, targets, sonobuoys, chaff, and flares, could be deposited on the ocean floor. The widely dispersed, intermittent, minute size of the material minimizes the impact. Wave energy and currents will further disperse the materials.</p> <p><b>Alternative 1:</b> Implementation of Alternative 1 would not result in significant impacts associated with the use of hazardous materials. Impacts from hazardous materials and waste from increased training activities, RDT&amp;E activities, and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Implementation of Alternative 2 would not result in significant impacts associated with the use of hazardous materials. Impacts from hazardous materials and waste from additional increases in training activities, RDT&amp;E activities, and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2.</p> <p>Chapters 4.0 and 5.0 discuss in detail the factors that influenced this analysis.</p>
Health and Safety	<p><b>No-action:</b> Implementation of the No-action Alternative would not affect public health and safety. Any potential risk to public health and safety is minimized through standard operating procedures and compliance with DoD Directive 4540.1, OPNAVINST 3770.4 and Commander, Naval Surface Force, U.S. Pacific Fleet (COMNAVSURFPAC) Instruction 3120.8F. The Navy notifies the public of hazardous activities through the use of Notices to Airmen (NOTAMs) and Notices to Mariners (NOTMARS).</p> <p><b>Alternative 1:</b> Implementation of Alternative 1 would not affect public health and safety. Any potential impacts on health and safety from the additional training activities, RDT&amp;E activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Implementation of Alternative 2 would not affect public health and safety. Any potential impacts on health and safety from the additional training activities, RDT&amp;E activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.</p> <p>Chapters 4.0 and 5.0 discuss in detail the factors that influenced this analysis.</p>
Noise	<p><b>No-action:</b> Implementation of the No-action Alternative would not incrementally affect noise within the HRC. Activities are remote, infrequent, and lack sensitive receptors. In addition, training activities do not have an effect on sensitive noise receptors because these activities are typically conducted away from populated areas and most sensitive noise receptors. Standard operating procedures are used to ensure the area is clear of civilian vessels or other non-participants. The public is notified of the location, date, and time of the hazardous activities via NOTMARS, thereby precluding any acoustical impacts on sensitive receptors.</p> <p><b>Alternative 1:</b> Implementation of Alternative 1 would not incrementally affect noise within the HRC. Impacts from noise from increased training activities, RDT&amp;E activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Implementation of Alternative 2 would not incrementally affect noise within the HRC. Impacts from noise from additional training activities, RDT&amp;E activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2.</p> <p>Chapters 4.0 and 5.0 discuss in detail the factors that influenced this analysis.</p>
Water Resources	<p><b>No-action:</b> Potential water quality impacts associated with the implementation of the No-action Alternative are transitory in nature and would not reach a level of significance. No long-term significant impacts on water quality are anticipated. Impacts are not anticipated due to the small quantities of materials relative the extent of the sea ranges and large volumes of water in which they will be dispersed.</p> <p><b>Alternative 1:</b> Impacts on water resources from increase training activities, RDT&amp;E activities, and Major Exercises are not anticipated. Any potential impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on water resources from increased training activities, future RDT&amp;E activities, and Major Exercises are not anticipated. Any potential impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Water Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapters 4.0 and 5.0 discuss in detail the factors that influenced this analysis.</p>

Note: Impacts on Biological Resources (Onshore), Geology and Soils, Land Use, and Utilities are not applicable. Impacts discussed for biological resources in the Open Ocean apply to both offshore and onshore areas. There are no impacts on Air Quality, Socioeconomics or Transportation due to site activities under the No-action Alternative, Alternative 1, Alternative 2 or Alternative 3.

**Table ES-3. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Northwestern Hawaiian Islands**

Resource Category	Northwestern Hawaiian Islands
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Some current flight trajectories could result in missiles such as the Terminal High Altitude Area Defense (THAAD) flying over portions of the Papahānaumokuākea Marine National Monument. Preliminary results of debris analysis indicate that debris is not expected to severely harm threatened, endangered, migratory, or other endemic species on or offshore of Nihoa and Necker Islands. The probability for debris to hit birds, seals, or other wildlife will be extremely low. Quantities of falling debris will be low and widely scattered so as not to present a toxicity issue. Falling debris will also have cooled down sufficiently so as not to present a fire hazard for vegetation and habitat. If feasible, consideration will be given to alterations in the missile flight trajectory, to further minimize the potential for debris impacts.</p> <p><b>Alternative 1:</b> There are no additional proposed activities or exercises that would affect the Northwestern Hawaiian Islands; ongoing activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> There are no additional proposed activities or exercises that would affect the Northwestern Hawaiian Islands; ongoing activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses in detail the factors that influenced this analysis.</p>
Cultural Resources	<p><b>No-action:</b> Missile defense activities, including THAAD, have the potential to generate debris that falls within areas of the Papahānaumokuākea Marine National Monument. Debris analyses of the types, quantities, and sizes associated with the Pacific Missile Range Facility missile activities indicate that the potential to impact land resources of any type on Nihoa or Necker is low and extremely remote. In addition, trajectories can be altered under certain circumstances to further minimize the potential for impacts. Future missions will include consideration of missile flight trajectory alterations, if feasible, to minimize the potential for debris within these areas. As a result, impacts on cultural resources within the Northwestern Hawaiian Islands are not expected.</p> <p><b>Alternative 1:</b> There are no additional proposed activities or exercises that would affect the Northwestern Hawaiian Islands; the potential for impacts from ongoing activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> There are no additional proposed activities or exercises that would affect the Northwestern Hawaiian Islands; the potential for impacts from ongoing activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapters 4.0 and 5.0 discuss in detail the factors that influenced this analysis.</p>

Note: No impacts on Air Quality, Airspace, Geology and Soils, Hazardous Materials and Waste, Health and Safety, Land Use, Noise, Socioeconomics, Transportation, Utilities, and Water Resources are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Air Quality	<p><b>No-action:</b> Air quality conditions will not differ from existing conditions. Compliance with standard operating procedures and air permits will continue to minimize impacts. Emissions generated by base activities do not affect the regional air quality. The tempo of launch events will continue to be managed by range activities in order to stay within the limits of current agreements.</p> <p><b>Alternative 1:</b> Potential impacts on air quality from increased training activities, RDT&amp;E activities, HRC enhancements, and Major Exercises would be minimized as described in the No-action Alternative. Construction would create fugitive dust emissions, diesel exhaust emissions; no change in regional air quality due to compliance with standard operating procedures for construction, including implementation of dust suppression methods and a vehicle maintenance program. No change to regional air quality is anticipated.</p> <p><b>Alternative 2:</b> Impacts on air quality from increased training activities, RDT&amp;E activities, and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. No change to regional air quality status is anticipated.</p> <p><b>Alternative 3:</b> Air Quality impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Infrequent emissions associated with intermittent use of diesel generators; no change in current regional air quality.</p> <p><b>Alternative 1:</b> Increased use of diesel generators; construction would create fugitive dust emissions, diesel exhaust emissions, and VOCs; no change in regional air quality due to compliance with standard operating procedures for construction, including implementation of dust suppression methods and a vehicle maintenance program is anticipated. No change to regional air quality is anticipated.</p> <p><b>Alternative 2:</b> Impacts from increased training activities and Major Exercises would be minimized as described above in Alternative 1.</p> <p><b>Alternative 3:</b> Air Quality impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Infrequent emissions associated with intermittent use of diesel generators; no change in current regional air quality.</p> <p><b>Alternative 1:</b> Increased use of diesel generators; construction would create fugitive dust emissions, diesel exhaust emissions, and VOCs; no change in regional air quality due to compliance with standard operating procedures for construction, including implementation of dust suppression methods and a vehicle maintenance program is anticipated. No change to regional air quality is anticipated.</p> <p><b>Alternative 2:</b> Impacts from increased training activities, and Major Exercises would be minimized as described in Alternative 1.</p> <p><b>Alternative 3:</b> Air Quality impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Airspace	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways and jet routes, or airports and airfields will continue to be minimized through standard operating procedures, compliance with DoD Directive 4540.1, OPNAVINST 3770.4A, OPNAVINST 3721.20, and continued close coordination with the FAA. No modifications or need for additional airspace is required.</p> <p><b>Alternative 1:</b> Impacts on airspace from ongoing activities, increased training activities, increase RDT&amp;E activities, planned test and evaluation activities, or HRC enhancements would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on airspace from ongoing activities, additional Major Exercises, increased training exercises, or additional RDT&amp;E activities would be minimized as described in the No-action alternative.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1 and Alternative 2 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
<p>Biological Resources (Offshore and Onshore)</p>	<p><b>No-action:</b> Activities take place in current operating areas, with no expansion. Compliance with relevant Navy policies and procedures during these training activities will continue to minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. No impacts from electromagnetic radiation generation to wildlife are anticipated.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities, RDT&amp;E activities, and HRC enhancements would be minimized as described above in the No-action Alternative. Because construction-related noise would be localized, intermittent, and occur over a relatively short-term, the potential for impacts on biological resources would be minimal. Additional electromagnetic radiation would not affect wildlife. Sound levels from FCLPs would be similar to existing sound levels on the runway.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities, RDT&amp;E activities, and Major Exercises would be minimized as described above in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures. Additional it is anticipated that electromagnetic radiation would not affect wildlife.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion anticipated. Compliance with relevant Navy policies and procedures during these training activities will continue to minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Currently there are no impacts from electromagnetic radiation generation to wildlife.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative. Effects on wildlife from construction-related noise and presence of additional personnel would be minimal. Additional electromagnetic radiation is not anticipated to affect wildlife.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures. Additional electromagnetic radiation is not anticipated to affect wildlife.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion anticipated. Compliance with relevant Navy policies and procedures will continue to minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Currently there are no impacts from electromagnetic radiation generation to wildlife.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative. Effects on wildlife from construction-related noise and presence of additional personnel would be minimal. Additional electromagnetic radiation is not anticipated to affect wildlife.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures. Additional electromagnetic radiation is not anticipated to affect wildlife.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Cultural Resources	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Any potential for impacts on cultural resources are offset through compliance with the PMRF Integrated Cultural Resources Management Plan (ICRMP) and standard operating procedures.</p> <p><b>Alternative 1:</b> Any potential impacts from increased training activities, RDT&amp;E activities, and HRC enhancements would be minimized as described above in the No-action Alternative. <b>Alternative 2:</b> Any potential impacts from increased training activities, RDT&amp;E activities, and Major Exercises (e.g., RIMPAC) would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Makaha Ridge has been surveyed for archaeological, historical, and Native Hawaiian resources and none have been identified. As a result, No-action Alternative activities will not affect any cultural resources.</p> <p><b>Alternative 1:</b> An increase in the tempo and frequency of training activities would not affect any cultural resources because Makaha Ridge has been surveyed for cultural resources and there are none present. If archaeological or Native Hawaiian resources are unexpectedly encountered during HRC enhancements, the Hawaii SHPO would be notified.</p> <p><b>Alternative 2:</b> Any potential impacts and proposed mitigations would be the same as described in Alternative 1.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2 and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>
Geology and Soils	<p><b>No-action:</b> Ongoing training activities and exercises will continue to have minimal direct impact on the beach and inland areas, and soils are not being permanently affected.</p> <p><b>Alternative 1:</b> New construction would follow standard methods to control erosion during construction. Soil disturbance would be limited to the immediate vicinity of the construction area and would be of short duration. Base personnel would exercise best management practices to reduce soil erosion.</p> <p><b>Alternative 2:</b> Impacts would be minimized as described above in Alternative 1.</p> <p><b>Alternative 3:</b> Geology and Soils impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Hazardous Materials and Waste	<p><b>No-action:</b> PMRF/Main Base has appropriate plans and standard operating procedures in place to manage hazardous materials and waste.</p> <p><b>Alternative 1:</b> Impacts from hazardous materials and waste from increased training activities, RDT&amp;E activities, and HRC enhancements would be minimized as described above in the No-action Alternative. Any construction activities would comply with standard operating procedures and adhere to the existing hazardous management plans.</p> <p><b>Alternative 2:</b> Impacts from hazardous materials and waste from additional increases in training activities, RDT&amp;E activities and additional Major Exercises would be minimized as described above in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Hazardous Materials and Wastes impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Makaha Ridge currently has appropriate plans in place to manage hazardous materials and waste.</p> <p><b>Alternative 1:</b> The increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative. Any construction activities would comply with standard operating procedures and adhere to the existing hazardous management plans.</p> <p><b>Alternative 2:</b> Impacts from hazardous materials and waste from additional increases in training activities and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Hazardous Materials and Wastes impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Kokee currently has appropriate plans in place to manage hazardous materials and waste.</p> <p><b>Alternative 1:</b> The increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative. Any construction activities would comply with standard operating procedures and adhere to the existing hazardous management plans.</p> <p><b>Alternative 2:</b> Impacts from additional increases in training activities and Major Exercises would be minimized as described above in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Hazardous Materials and Wastes impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>
Health and Safety	<p><b>No-action:</b> Risk to public health and safety is will continue to be minimized through compliance with standard operating procedures, policies, and plans.</p> <p><b>Alternative 1:</b> Impacts on health and safety from additional training activities, RDT&amp;E activities, HRC enhancements, and Major Exercises would be minimized as described above in the No-action Alternative. Construction would be in accordance with USACE Safety and Health Requirements Manual.</p> <p><b>Alternative 2:</b> Impacts on health and safety from additional training activities, RDT&amp;E activities, and additional Major Exercises would be minimized as described above in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Compliance with standard operating procedures will continue to minimize impacts. All location(s) are away from the public which results in no adverse public health and safety issues.</p> <p><b>Alternative 1:</b> Impacts on health and safety from additional training activities and Major Exercises would be minimized as described above in the No-action Alternative. Construction would be in accordance with USACE Safety and Health Requirements Manual.</p> <p><b>Alternative 2:</b> Impacts on health and safety from additional training activities and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Compliance with standard operating procedures will continue to minimize impacts.</p> <p><b>Alternative 1:</b> Impacts on health and safety from additional training activities and Major Exercises would be minimized as described above in the No-action Alternative. Construction would be in accordance with USACE Safety and Health Requirements Manual.</p> <p><b>Alternative 2:</b> Impacts on health and safety from additional training activities and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>



**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Land Use	<p><b>No-action:</b> Land uses and Agricultural Preservation Initiative are compatible with PMRF activities. The continuation of activities will be consistent to the maximum extent practicable with the Hawaii Coastal Zone Management Program. Closure of public recreational areas during hazardous activities will continue</p> <p><b>Alternative 1:</b> Land use is compatible with increased training activities, training activities, RDT&amp;E activities, HRC enhancements, and Major Exercises; additional closure of public recreation areas during hazardous activities is anticipated. Addition of FCLPs would not alter current land use patterns.</p> <p><b>Alternative 2:</b> Land uses would be compatible with proposed increased training activities, training activities, RDT&amp;E activities, and additional Major Exercises; additional closure of public recreation areas during hazardous activities is anticipated.</p> <p><b>Alternative 3:</b> Land Use impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Noise	<p><b>No-action:</b> PMRF maintains a hearing protection program and has standard operating procedures in place that minimize impacts. Beach access to the areas of each of the exercises is restricted for the duration of the exercise.</p> <p><b>Alternative 1:</b> Impacts from noise from increased training activities (including FCLPs), RDT&amp;E activities, and HRC enhancements would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from noise from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Socioeconomics	<p><b>No-action:</b> Beneficial impacts on economy and community on Kauai.</p> <p><b>Alternative 1:</b> Small increase in beneficial impacts on economy on Kauai from increased training activities, future RDT&amp;E activities, and Major Exercises.</p> <p><b>Alternative 2:</b> Small increase in beneficial impacts on economy on Kauai from increased training activities, future RDT&amp;E activities, and additional Major Exercises.</p> <p><b>Alternative 3:</b> Socioeconomic impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-4A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	PMRF/Main Base	Makaha Ridge	Kokee
Transportation	<p><b>No-action:</b> No impacts identified for the transportation system; PMRF events are discrete and intermittent. Transportation of ordnance and liquid propellants are conducted in accordance with established procedures.</p> <p><b>Alternative 1:</b> Minimal increase in average daily traffic due to increased training activities, HRC enhancements, and Major Exercises. Traffic generated by construction personnel would be temporary and would result in minor additional traffic. Major exercises are discrete and intermittent with minimal temporary increase in traffic.</p> <p><b>Alternative 2:</b> No additional traffic would be generated for increased training activities, RDT&amp;E activities, and additional Major Exercises above what would be generated for Alternative 1.</p> <p><b>Alternative 3:</b> Transportation impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Utilities	<p><b>No-action:</b> Current utility capacity meets demands.</p> <p><b>Alternative 1:</b> Electricity demand, potable water consumption, wastewater generated, and solid waste disposal would be handled by existing facilities.</p> <p><b>Alternative 2:</b> Additional electricity demand, potable water consumption, wastewater generated and solid waste disposal would be handled by existing facilities. Operation of a high-energy laser would require 30 megawatts of power (additional documentation would be required).</p> <p><b>Alternative 3:</b> Utility impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Water Resources	<p><b>No-action:</b> Compliance with standard operating procedures and policies will continue to minimize impacts. Training activities have minimal impact on beach and inland areas and surface drainage is not permanently affected. Emissions from launches and exercises do not significantly affect water resources.</p> <p><b>Alternative 1:</b> Impacts on water resources from increased training activities, RDT&amp;E activities, HRC enhancements, and Major Exercises would be minimized as described in the No-action Alternative. Slight increase in missile launch emissions would not significantly affect water quality. Construction activities associated with HRC enhancements would follow standard operating procedures minimizing potential impacts from accidental spills of hazardous materials.</p> <p><b>Alternative 2:</b> Impacts on water resources from increased training activities, RDT&amp;E activities, HRC enhancements, and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Water Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-4B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai**

Resource Category	Hawaii Air National Guard Kokee	Kamokala Magazines	Niihau	Kaula
Airspace	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p><b>No-action:</b> Continued close coordination with the FAA and PMRF regarding continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways, and jet routes will continue to minimize impacts.</p> <p><b>Alternative 1:</b> Impacts on airspace from ongoing activities, increased training activities, RDT&amp;E activities or HRC investments would be minimized as described above in the No-action Alternative. No new airspace proposal or any modification to existing airspace is anticipated.</p> <p><b>Alternative 2:</b> Impacts on airspace from ongoing activities, additional Major Exercises, increased training exercises, or additional RDT&amp;E activities or HRC investments would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion anticipated. Compliance with relevant Navy policies and procedures will continue to minimize the effects on wildlife. Currently there are no impacts from electromagnetic radiation generation to wildlife.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities would be minimized as described above in the No-action Alternative. Additional electromagnetic radiation is not anticipated to affect wildlife.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy policies and procedures during these training activities will minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. No impacts from electromagnetic radiation generation to wildlife.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described in the No-action Alternative. Minimal impacts on biological resources from construction; additional electromagnetic radiation would not affect wildlife.</p>	<p><b>No-action:</b> Currently there are minimal impacts on vegetation; Mitigation measures are in place that reduce or eliminate any potential impacts on marine mammals. Currently there are minimal impacts on migratory seabirds.</p> <p><b>Alternative 1:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion anticipated. Compliance with relevant Navy, NMFS, and USFWS policies and procedures during these training activities would minimize the effects on vegetation and wildlife.</p>

**Table ES-4B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	Hawaii Air National Guard Kokee	Kamokala Magazines	Niihau	Kaula
Biological Resources (Offshore and Onshore) (Continued)			<p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and Major Exercises would be as described above in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures. <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures. No potential impacts on migratory seabird populations. <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Cultural Resources	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>	<p><b>No-action:</b> There are no known cultural resources sites within the ROI for Kaula; therefore, there will be no impacts on cultural resources from training activities or Major Exercises. <b>Alternative 1:</b> There are no known cultural resources sites within the ROI for Kaula; therefore, there will be no impacts on cultural resources from increased training activities. <b>Alternative 2:</b> There will be no impacts on cultural resources from any additional increases in training activities because there are no known cultural resources within the Kaula ROI. <b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2.</p>

**Table ES-4B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	Hawaii Air National Guard Kokee	Kamokala Magazines	Niihau	Kaula
Geology and Soils	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<p><b>No-action:</b> Impacts are currently minimized due to concentrating targeting on the southeast tip of the island.</p> <p><b>Alternative 1:</b> Impacts from Increased training and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased training and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Geology and Soils impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Hazardous Materials and Waste	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<p><b>No-action:</b> PMRF currently has procedures in place to manage hazardous materials and waste. Storage and transportation or ordnance is conducted in accordance with established DOT, DoD, and Navy safety procedures.</p> <p><b>Alternative 1:</b> Impacts would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts would be minimized as described in the No-action Alternative. <b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> PMRF currently has appropriate plans in place to manage hazardous materials and waste.</p> <p><b>Alternative 1:</b> Impacts from the increase in training activities and Major Exercises would be minimized as described in the No-action Alternative. Any construction activities would comply with standard operating procedures and adhere to the existing hazardous management plans.</p> <p><b>Alternative 2:</b> Impacts from additional increases in training activities and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.

**Table ES-4B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Kauai (Continued)**

Resource Category	Hawaii Air National Guard Kokee	Kamokala Magazines	Niihau	Kaula
Health and Safety	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<b>No-action:</b> Compliance with existing health and safety plans and procedures will continue to minimize impacts. No change in the type of ordnance stored and no increase safety risks. Storage and transportation of ordnance are conducted in accordance with established DOT, DoD and Navy safety procedures. <b>Alternative 1:</b> Impacts would be minimized as described above in the No-action Alternative. The factors that influenced this analysis. <b>Alternative 2:</b> Impacts would be minimized as described above in the No-action Alternative. <b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.	<b>No-action:</b> Compliance with existing health and safety plans and procedures will continue to minimize impacts. Location of radar and electronic warfare sites away from the public results in no adverse public health and safety issues. <b>Alternative 1:</b> Impacts from additional training activities and Major Exercises would be minimized as described above in the No-action Alternative. Construction would be in accordance with USACE Safety and Health Requirements Manual. <b>Alternative 2:</b> Impacts from additional training activities and Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. <b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.	<b>No-action:</b> Compliance with existing health and safety plans and procedures will continue to minimize health and safety risks. <b>Alternative 1:</b> Impacts from additional training activities would be minimized as described above in the No-action Alternative. <b>Alternative 2:</b> Impacts from additional training activities would be minimized as described above in the No-action Alternative. <b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.
Land Use	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<b>No-action:</b> Land use is compatible with Navy activities. The continuation of activities will remain consistent to the maximum extent practicable with the Hawaii Coastal Zone Management Program. <b>Alternative 1:</b> Land use is compatible with increased activities and Major Exercises. <b>Alternative 2:</b> Land use is compatible with increased activities and Major Exercises. <b>Alternative 3:</b> Land use impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.

Note: No impacts at Port Allen, Kikiaola Small Boat Harbor, or Mt. Kahili are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. No impacts on Air Quality, Geology and Soils, Noise, Socioeconomics, Transportation, Utilities, and Water Resources are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.

**Table ES-5A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Naval Station Pearl Harbor	Ford Island	Naval Inactive Ship Maintenance Facility, Pearl Harbor
<p>Biological Resources (Offshore and Onshore)</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize the potential for impacts on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. No impacts on essential fish habitat.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased activities and Major Exercises would be minimized as described in the No-action Alternative. Activities would take place at existing locations; no expansion of the area would be involved.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize the potential for impacts on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. No impacts on essential fish habitat. No critical habitat has been identified.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased activities and Major Exercises would be minimized as described in the No-action Alternative. Activities would take place at existing locations; no expansion of the area would be involved.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Minor and localized impacts on fish. No impacts on essential fish habitat.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased activities and Major Exercises would be minimized as described in the No-action Alternative. Activities would take place at existing locations; no expansion of the area would be involved.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
<p>Cultural Resources</p>	<p><b>No-action:</b> To minimize any potential impacts, activities will continue to be conducted in accordance with the policies, guidelines, and standard operating procedures outlined in the Pearl Harbor Naval Complex Integrated Cultural Resources Management Plan (ICRMP), or any other agreement documents promulgated since completion of the ICRMP. There are no significant cultural resources within the direct ROI for activities. The Loko Okiokiolepe fishpond is the closest National Register property (approximately half a mile north of the EOD Shore Range).</p> <p><b>Alternative 1:</b> Any potential impacts from increased training activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any potential impacts from additional increases in training activities would minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> There are no training or Major Exercises with the potential to affect cultural resources.</p> <p><b>Alternative 1:</b> Installation of equipment to support the ATF [Acoustic Test Facility] would be conducted in accordance with the Pearl Harbor Naval Complex ICRMP and would require coordination with the Navy Region Hawaii's cultural resource coordinator.</p> <p><b>Alternative 2:</b> There are no new Major Exercises or training activities with the potential to affect cultural resources.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>

**Table ES-5A. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Naval Station Pearl Harbor	Ford Island	Naval Inactive Ship Maintenance Facility, Pearl Harbor
Hazardous Materials and Waste	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<b>No-action:</b> Naval Inactive Ship Maintenance Facility, Pearl Harbor has appropriate plans in place to manage hazardous materials used and generated. <b>Alternative 1:</b> Impacts from the increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative. <b>Alternative 2:</b> Impacts from additional increases in training activities and Major Exercises would be minimized as described in the No-action Alternative. <b>Alternative 3:</b> Hazardous Materials and Wastes impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.
Socioeconomics	<b>No-action</b> Beneficial impacts on economy and community on Oahu. <b>Alternative 1:</b> Current Beneficial impacts would continue. Small increase in beneficial impacts on economy on Oahu from increased RDT&E and Major Exercises. <b>Alternative 2:</b> Current Beneficial impacts would continue. Small increase in beneficial impacts on economy on Oahu from increased training activities, and additional Major Exercises. <b>Alternative 3:</b> Socioeconomic impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.
Water Resources	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<b>No-action:</b> There are no training activities, RDT&E activities, or Major Exercises with the potential to affect water resources. <b>Alternative 1:</b> There are no training activities, RDT&E activities, or Major Exercises with the potential to affect water resources. HRC enhancements would adhere to standard operating procedures for construction to minimize and avoid adverse impacts on water quality. <b>Alternative 2:</b> Impacts would be minimized as described above in Alternative 1. <b>Alternative 3:</b> Water Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.

Note: No impacts on Air Quality, Airspace, Geology and Soils, Health and Safety, Land Use, Noise, Transportation, and Utilities, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.



**Table ES-5B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	EOD Range NAVMAG Pearl Harbor West Loch	Lima Landing	Puuloa Underwater Range
<p>Biological Resources (Offshore and Onshore)</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. Intrusive noise could startle noise-sensitive wildlife in the vicinity.  <b>Alternative 1:</b> Impacts from increased activities and training exercises would be minimized as described above in the No-action Alternative.  <b>Alternative 2:</b> Impacts from additional increases in activities and training exercises would be minimized as described above in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. Minor and localized impacts on fish. No impacts on essential fish habitat.  <b>Alternative 1:</b> Impacts from increased activities and exercises would be minimized as described in the No-action Alternative. Activities would take place at existing locations; no expansion of the area would be involved. Minor and localized impacts on fish.  <b>Alternative 2:</b> Impacts from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. Minor and localized impacts on fish. No impacts on essential fish habitat. Any effects from noise, shock, or residual chemicals will be localized and temporary.  <b>Alternative 1:</b> Impacts from increased activities and Major Exercises would be minimized as described in the No-action Alternative. Activities would take place at existing locations; no expansion of the area would be involved.  <b>Alternative 2:</b> Impacts from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative and Alternative 1. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
<p>Cultural Resources</p>	<p><b>No-action:</b> There are no ongoing training activities with the potential to affect cultural resources because there are no cultural resources present in the ROI.  <b>Alternative 1:</b> Increasing training activities would not affect cultural resources because there are no cultural resources present in the ROI.  <b>Alternative 2:</b> Additional increases in training activities would not affect cultural resources because there are no cultural resources present in the ROI.  <b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> There are no cultural resources within the ROI for Lima Landing’s underwater demolition activities therefore no effects on cultural resources are expected. Any changes to the location of these activities would be coordinated with the Navy Region, Hawaii, cultural resources coordinator  <b>Alternative 1:</b> Because there are no cultural resources within the ROI, no impacts on cultural resources are expected from increased training.  <b>Alternative 2:</b> Because there are no cultural resources within the ROI, no impacts on cultural resources are expected from additional increases in training.  <b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> There are no cultural resources within the ROI for Puuloa Underwater Range activities; therefore no effects on cultural resources are expected.  <b>Alternative 1:</b> Because there are no cultural resources within the ROI, no impacts on cultural resources are expected from increased training.  <b>Alternative 2:</b> Because there are no cultural resources within the ROI, no impacts on cultural resources are expected from increased training.  <b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-5B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	EOD Range NAVMAG Pearl Harbor West Loch	Lima Landing	Puuloa Underwater Range
Geology and Soils	<p><b>No-action:</b> Policies and procedures are in place to minimize any impacts. EOD training is not expected to affect the geology of the Range; no construction or excavation is planned. Minor contamination of surface soil.</p> <p><b>Alternative 1:</b> Impacts from increased training activities would be minimized as described above in the No-action Alternative</p> <p><b>Alternative 2:</b> Impacts from additional Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Geology and Soils impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Hazardous Materials and Waste	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p><b>No-action:</b> Lima Landing has appropriate plans in place to manage hazardous materials used and generated.</p> <p><b>Alternative 1:</b> Impacts from the increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from additional increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Puuloa Underwater Range has appropriate plans in place to manage hazardous materials used and generated.</p> <p><b>Alternative 1:</b> Impacts from the increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional increase in training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-5B. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	EOD Range NAVMAG Pearl Harbor West Loch	Lima Landing	Puuloa Underwater Range
Health and Safety	<p><b>No-action:</b> Compliance with standard operating procedures will continue to minimize impacts. Location away from the public results in no adverse public health and safety issues.</p> <p><b>Alternative 1:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts. Location away from the public results in no adverse public health and safety issues. Demolition activities are conducted in accordance with COMNAVSURFPAC Instruction 3120.8F.</p> <p><b>Alternative 1:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts. Location away from the public results in no adverse public health and safety issues. Demolition activities are conducted in accordance with COMNAVSURFPAC Instruction 3120.8F</p> <p><b>Alternative 1:</b> Impacts from the additional training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Water Resources	<p><b>No-action:</b> Intermittent, short-term discharges of minute amounts of munitions constituents into surface waters and have no effect on water resources.</p> <p><b>Alternative 1:</b> Increases in training activities would not significantly affect water resources.</p> <p><b>Alternative 2:</b> Additional increases in training activities would not significantly affect water resources.</p> <p><b>Alternative 3:</b> Water Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

Note: No impacts on Air Quality, Airspace, Land Use, Noise, Socioeconomics, Transportation, and Utilities, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.

**Table ES-5C. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Naval Defensive Sea Area	CG Station Barbers Point/Kalaeola Airport	Marine Corps Base Hawaii
Airspace	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, and coordination with the State of Hawaii, U.S. Coast Guard, Kalaeola Airport, and the FAA. No modifications or need for additional airspace is required.</p> <p><b>Alternative 1:</b> Impacts on airspace from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on airspace from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures and continued close coordination with the FAA. No modifications or need for additional airspace is required.</p> <p><b>Alternative 1:</b> Impacts on airspace from increased training activities, and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on airspace from ongoing activities, increased training activities, and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. No essential fish habitat affected.</p> <p><b>Alternative 1:</b> Impacts would be minimized as described above in the No-action Alternative. Increased activities and Major Exercises would take place at existing locations; no expansion of the area would be involved.</p> <p><b>Alternative 2:</b> Impacts would be minimized as described above in the No-action Alternative. Increased activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy and Coast Guard policies and procedures during these training activities will continue to minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species.</p> <p><b>Alternative 1:</b> Impacts from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased training activities and Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Marine Corps and Navy procedures and policies are in place to minimize impacts on biological resources and prevent introduction of invasive species.</p> <p><b>Alternative 1:</b> Impacts from increased training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased activities and additional Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-5C. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	Naval Defensive Sea Area	CG Station Barbers Point/Kalaeola Airport	Marine Corps Base Hawaii
Cultural Resources	<p><b>No-action:</b> There are no known historic properties (i.e., cultural resources eligible for or listed in the National Register) located within the ROI for the Naval Defensive Sea Area; therefore, there will be no impacts on cultural resources from training and RDT&amp;E operations under the No-action.</p> <p><b>Alternative 1:</b> Because there are no known historic properties within the ROI, increased training activities and Major Exercises will have no impacts on cultural resources.</p> <p><b>Alternative 2:</b> Because there are no known historic properties within the ROI, additional increases in training activities and Major Exercises will have no impacts on cultural resources.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with the standard operating procedures and policies minimizes impacts. If cultural resources are unexpectedly encountered the Hawaii SHPO will be notified.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Health and Safety	<p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts. The activities will be completely contained and the area cleared resulting in no adverse public health and safety issues.</p> <p><b>Alternative 1:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-5C. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	Naval Defensive Sea Area	CG Station Barbers Point/Kalaeola Airport	Marine Corps Base Hawaii
Noise	A review of this environmental resource against training and RDT&E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.	<p><b>No-action:</b> Coast Guard Air Station Barbers Point has appropriate plans in place to manage noise levels. Noise produced is expected to stay within the existing noise contours.</p> <p><b>Alternative 1:</b> Minor impacts are anticipated for areas near the airport from increased activities, training exercises, and Major Exercises.</p> <p><b>Alternative 2:</b> Minor impacts are anticipated for areas near the airport from increased activities, training exercises, and Major Exercises.</p> <p><b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> MCBH maintains a hearing protection program that will continue to minimize impacts. Noise levels that reach off-post are mitigated by public notification and restricting training to daylight hours.</p> <p><b>Alternative 1:</b> Increased training activities would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. <b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>

Note: No impacts on Air Quality, Geology and Soils, Hazardous Materials and Waste, Land Use, Socioeconomics, Transportation, Utilities, and Water Resources, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.

**Table ES-5D. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	MCTAB	Hickam AFB	Wheeler Army Airfield
<p>Airspace</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, and coordination with the Air Force, Honolulu International Airport, and the FAA. No modifications or need for additional airspace is required.  <b>Alternative 1:</b> Impacts on airspace from increased training activities would be minimized as described above in the No-action Alternative.  <b>Alternative 2:</b> Impacts on airspace from increased training activities and additional Major Exercises would be minimized as described in the No-action Alternative.  <b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2.                      Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, and coordination with the Army and the FAA. No modifications or need for additional airspace is required.  <b>Alternative 1:</b> Impacts on airspace from increased training activities would be minimized as described in the No-action Alternative.  <b>Alternative 2:</b> Impacts on airspace from increased training activities and additional Major Exercises would be minimized as described in the No-action Alternative.  <b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2.                      Chapter 4.0 discusses the factors that influenced this analysis.</p>
<p>Biological Resources (Offshore and Onshore)</p>	<p><b>No-action:</b> MCTAB and Navy procedures and policies are in place to minimize impacts on biological resources and prevent introduction of invasive species.  <b>Alternative 1:</b> Increased training activities would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.  <b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.                      Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Hickam AFB and Navy procedures and policies are in place to continue to minimize impacts on biological resources and prevent introduction of invasive species. Chapter 4.0 discusses the factors that influenced this analysis.  <b>Alternative 1:</b> Increased training activities and Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.  <b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.                      Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Army and Navy procedures and policies are in place to minimize impacts on biological resources and prevent introduction of invasive species. No critical habitat has been identified on Wheeler Army Airfield.  <b>Alternative 1:</b> Increased training activities and Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.  <b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.  <b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.                      Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-5D. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	MCTAB	Hickam AFB	Wheeler Army Airfield
Cultural Resources	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with standard operating procedures and policies minimizes impacts. If cultural resources are unexpectedly encountered the Bellows AFS cultural resources coordinator will be notified.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>

Note: No impacts on Air Quality, Geology and Soils, Hazardous Materials and Waste, Health and Safety, Land Use, Noise, Socioeconomics, Transportation, Utilities, and Water Resources, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.



**Table ES-5E. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Makua Military Reservation	Kahuku Training Area	Dillingham Military Reservation
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy and Army policies, procedures, and plans during these training activities will continue to minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Critical habitat and sensitive areas will be avoided where possible.</p> <p><b>Alternative 1:</b> Impacts from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased training activities and Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy and Army policies, procedures, and plans during these training activities will minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Critical habitat and sensitive areas will be avoided where possible.</p> <p><b>Alternative 1:</b> Impacts from increased training activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased training activities and Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Army and Navy procedures and policies are in place to minimize impacts on biological resources and prevent introduction of invasive species.</p> <p><b>Alternative 1:</b> Increased training activities and Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Cultural Resources	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with standard operating procedures, policies, and plans minimizes impacts. If cultural resources are unexpectedly encountered the Schofield Barracks cultural resources manager will be notified.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with standard operating procedures, policies, and plans minimizes impacts. If cultural resources are unexpectedly encountered the Schofield Barracks cultural resources manager will be notified.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with standard operating procedures, policies, and plans minimizes impacts. If cultural resources are unexpectedly encountered the Hawaii SHPO (if the find is made by Marine Corps or Navy) or the Schofield Barracks cultural resources manager (if the find occurs during Army activities) will be notified.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-5E. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu (Continued)**

Resource Category	Makua Military Reservation	Kahuku Training Area	Dillingham Military Reservation
Health and Safety	<p><b>No-action:</b> Compliance with standard operating procedures and plans will continue to minimize impacts.</p> <p><b>Alternative 1:</b> Impacts from the additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from the additional training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Noise	<p><b>No-action:</b> Makua Military Reservation maintains a hearing protection program that will minimize impacts.</p> <p><b>Alternative 1:</b> Increased training activities would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

Note: No impacts on Air Quality, Airspace, Geology and Soils, Hazardous Materials and Waste, Land Use, Socioeconomics, Transportation, Utilities, and Water Resources, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.

**Table ES-5F. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Ewa Training Minefield	Barbers Point Underwater Range	Naval Undersea Warfare Center
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. Minor and localized impacts on fish. Any effects from noise, shock, or residual chemicals will continue to be localized and temporary.</p> <p><b>Alternative 1:</b> Increased activities and Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources. Minor and localized impacts on fish. No impacts on essential fish habitat.</p> <p><b>Alternative 1:</b> Increased activities and Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Impacts would be minimized as described above in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>SESEF -</p> <p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources.</p> <p><b>Alternative 1:</b> Impacts from increased activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased activities would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p> <p>FORACS -</p> <p><b>No-action:</b> Procedures and policies are in place to minimize impacts on biological resources</p> <p><b>Alternative 1:</b> Impacts from increased activities would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts from increased activities would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>
Hazardous Materials and Waste	<p><b>No-action:</b> Ewa Training Minefield has appropriate plans in place to manage hazardous materials used and generated.</p> <p><b>Alternative 1:</b> Increases in training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Additional increases in training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Barbers Point Underwater Range has appropriate plans in place to manage hazardous materials used and generated.</p> <p><b>Alternative 1:</b> Increases in training activities and Major Exercises would be minimized as described above in the No-action Alternative</p> <p><b>Alternative 2:</b> Additional increases in training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Hazardous Materials and Waste impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-5F. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Oahu**

Resource Category	Ewa Training Minefield	Barbers Point Underwater Range	Naval Undersea Warfare Center
Health & Safety	<p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts. Demolition activities are conducted in accordance with COMNAVSURFPAC Instruction 3120.8F.</p> <p><b>Alternative 1:</b> The additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> The additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts. Demolition activities are conducted in accordance with COMNAVSURFPAC Instruction 3120.8F.</p> <p><b>Alternative 1:</b> The additional training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> The additional training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>SESEF &amp; FORACS -</p> <p><b>No-action:</b> Compliance with standard operating procedures will minimize impacts.</p> <p><b>Alternative 1:</b> The increased RDT&amp;E activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> The increased RDT&amp;E activities would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>

Note: No impacts on Air Quality, Airspace, Cultural Resources, Geology and Soils, Land Use, Noise, Socioeconomics, Transportation, Utilities, and Water Resources, are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean. No impacts at Keehi Lagoon, Kaena Point, Mt. Kaala, Wheeler Network Communications Control, Mauna Kapu Communication Site, or Makua Radio/Repeater/Cable Head are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3.

**Table ES-6. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Maui**

Resource Category	Maui Offshore
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Compliance with policies and procedures will continue to minimize impacts on biological resources.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities would be minimized as described in the No-action Alternative. The Portable Undersea Tracking Range would be used in areas around Maui with water depths less than 300 feet. Other than the temporary disturbance to marine species during instrumentation installation and recovery, no impacts would be expected to occur.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and additional Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 3:</b> Impacts on biological resources would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>

Note: No impacts on Air Quality, Airspace, Cultural Resources, Geology and Soils, Hazardous Materials and Waste, Health and Safety, Land Use, Noise, Socioeconomics, Transportation, Utilities, or Water Resources are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean. No impacts at the Maui Space Surveillance Site, the Shallow Water Minefield Sonar Training Area, the Maui High Performance Computing Center, or the Sandia Maui Haleakala Facility are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3.

**Table ES-7. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Hawaii**

Resource Category	Pohakuloa Training Area	Bradshaw Army Airfield	Kawaihae Pier
Airspace	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, coordination with PTA Range Control and the FAA. No modifications or need for additional airspace is required.</p> <p><b>Alternative 1:</b> Impacts on airspace from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on airspace from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Airspace impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Impacts on airspace from continued activities and activities to controlled and uncontrolled airspace, special use airspace, en route airways and jet routes, or airports and airfields are minimized through standard operating procedures, coordination with PTA Range Control and the FAA. No modifications or need for additional airspace is required.</p> <p><b>Alternative 1:</b> Impacts on airspace from increased training activities and Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on airspace from increased training activities and additional Major Exercises would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2 and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>
Biological Resources (Offshore and Onshore)	<p><b>No-action:</b> Training Activities and Major Exercises will take place in current operating areas, with no expansion. Compliance with relevant Navy policies, procedures, and plans during these training activities will minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> These activities are limited in scope and are not anticipated to impact the areas beyond the airfield itself. Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy policies, procedures, and plans during these training activities will minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species.</p> <p><b>Alternative 1:</b> Impacts on biological resources from increased training activities would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and additional Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds are anticipated. The intensity and duration of wildlife startle responses decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> Training Activities and Major Exercises take place in current operating areas, with no expansion. Compliance with relevant Navy policies and procedures during these training activities will minimize the effects on vegetation and wildlife, as well as limit the potential for introduction of invasive plant species. Sensitive biological resource areas are avoided.</p> <p><b>Alternative 1:</b> No increases in training events at Kawaihae Pier are expected. Impacts would be minimized as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on biological resources from increased training activities and additional Major Exercises would be minimized as described in the No-action Alternative. Temporary, short-term startle effects from noise to wildlife and birds anticipated. The intensity and duration of wildlife startle responses may decrease with the number and frequency of exposures.</p> <p><b>Alternative 3:</b> Biological Resources impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>

**Table ES-7. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Hawaii (Continued)**

Resource Category	Pohakuloa Training Area	Bradshaw Army Airfield	Kawaihae Pier
Cultural Resources	<p><b>No-action:</b> Activities occur in designated areas and sensitive areas are avoided. Compliance with standard operating procedures and policies minimizes impacts. If cultural resources are unexpectedly encountered then the PTA cultural resources manager will be contacted.</p> <p><b>Alternative 1:</b> Any impacts from increased training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Any impacts from additional increases in training activities would be treated as described above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p><b>No-action:</b> There are no training or Major Exercises with the potential to affect cultural resources at Bradshaw Army Airfield. Policies and procedures are in place to minimize any potential impacts.</p> <p><b>Alternative 1:</b> Because there is no training or Major Exercises with the potential to affect cultural resources at Bradshaw Army Airfield, no impacts on cultural resources are expected. To avoid impacts from any HRC enhancements, activities would be coordinated with the PTA cultural resources manager. Policies and procedures are in place to minimize any potential impacts.</p> <p><b>Alternative 2:</b> Because there is no training or Major Exercises with the potential to affect cultural resources at Bradshaw Army Airfield, no impacts on cultural resources are expected. To avoid impacts from any HRC enhancements, activities would be coordinated with the PTA cultural resources manager. Policies and procedures are in place to minimize any potential impacts.</p> <p><b>Alternative 3:</b> Cultural Resources impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>Analysis of any potential impacts from training and RDT&amp;E operations under the No-action, Alternative 1, Alternative 2, and Alternative 3 has been performed. Analysis indicates that neither short- nor long-term impacts are anticipated from the proposed alternatives.</p>
Health and Safety	<p><b>No-action:</b> Compliance with existing health and safety plans and procedures will minimize impacts.</p> <p><b>Alternative 1:</b> Impacts on health and safety from the additional training activities and HRC enhancements would be minimized as discussed above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Impacts on health and safety from the additional training activities and Major Exercises would be minimized as discussed above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Health and Safety impacts would be the same as those described under Alternative 2. Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

**Table ES-7. Summary of Environmental Impacts for the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3, Hawaii (Continued)**

Resource Category	Pohakuloa Training Area	Bradshaw Army Airfield	Kawaihae Pier
Noise	<p><b>No-action:</b> PTA will continue to maintain a hearing protection program that will minimize impacts.</p> <p><b>Alternative 1:</b> Increased training activities would take place at existing locations; no expansion of the area would be involved. Noise impacts would be minimized as discussed above in the No-action Alternative.</p> <p><b>Alternative 2:</b> Increased training activities and additional Major Exercises would take place at existing locations; no expansion of the area would be involved. Noise impacts would be minimized as discussed above in the No-action Alternative.</p> <p><b>Alternative 3:</b> Noise impacts would be the same as those described under Alternative 2.</p> <p>Chapter 4.0 discusses the factors that influenced this analysis.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>	<p>A review of this environmental resource against training and RDT&amp;E operations under the No-action Alternative, Alternative 1, Alternative 2, and Alternative 3 was performed. Analysis indicated that the proposed alternatives would not result in either short-or-long term impacts for this resource.</p>

Note: No impacts on Air Quality, Geology and Soils, Hazardous Materials and Waste, Land Use, Socioeconomics, Transportation, Utilities, and Water Resources are anticipated due to site activities under the No-action Alternative, Alternative 1, Alternative 2, or Alternative 3. Impacts on Biological Resources are also discussed under Open Ocean.



**Table ES-8. Summary of Mitigation Measures**

Resource Category*	Open Ocean	Northwestern Hawaiian islands	Kauai
Air Quality	None	None	Modify or renew current Title V permit for PMRF/Main Base for testing and operation of the Maritime Directed Energy Test Center.
Airspace	Depending on the intensity of the proposed lasers, nomenclature would need to be added to aeronautical charts, and certain test events could require Notices to Airmen (NOTAMs) and Notices to Mariners (NOTMARs).	None	Depending on the intensity of the lasers, nomenclature would need to be added to aeronautical charts, and certain test events could require NOTAMs and NOTMARs.
Biological Resources	<p>Train personnel in lookout/watchstander duties. Always at least three people on watch with binoculars. At least two additional personnel on watch during ASW exercises.</p> <p>All personnel engaged in passive acoustic sonar operation to monitor for marine mammal vocalizations. During MFA sonar operations use all available sensor and optical systems (such as night vision goggles). Use only passive capability of sonobuoys when marine mammals are detected within 200 yards.</p> <p>When marine mammals are detected by any means within 1,000 yards of the sonar dome (the bow), the ship or submarine will limit active transmission levels to at least 6 decibels (dB) below normal operating levels. If need for power-down should arise, Navy to follow the requirements as though they were operating at 235 dB—the normal operating level.</p> <p>Operate sonar at lowest practicable level, not to exceed 235 dB, except as required to meet tactical training objectives</p> <p>Helicopters to observe/survey vicinity of an ASW Operation for 10 minutes before first deployment of active (dipping) sonar in the water.</p> <p>Do not dip sonar within 200 yards of a marine mammal and cease pinging if a marine mammal closes within 200 yards after pinging has begun.</p>	None	<p>Target areas are determined to be clear of marine mammals and sea turtles prior to commencement of exercises.</p> <p>Within 1 hour prior to initiation of Expeditionary Assault activities, landing routes and beach areas are surveyed for the presence of sensitive wildlife.</p> <p>An exercise is halted if marine mammals are detected on the beach or in a target area.</p> <p>Pressure wash vehicles on the mainland to prevent spread of invasive plants.</p> <p>Shield night lighting to the extent practical.</p> <p>Foster the reestablishment of native vegetation</p> <p>Monitor and treatment to eliminate establishing exotic species.</p> <p>Prohibit living plants brought from mainland.</p> <p>Work with owners of Niihau Ranch to develop Hawaiian monk seal and green turtle monitoring programs.</p> <p>Training operations to avoid any beach area with green turtle nests.</p> <p>Seasonal use of Kaula during periods when humpback whales are not present.</p> <p>Survey the waters off Kaula to ensure that no whales are present.</p> <p>Limit the impact area to the southern tip of Kaula.</p> <p>RIMPAC exercises use non-explosive rounds on Kaula.</p>

**Table ES-8. Summary of Mitigation Measures (Continued)**

Resource Category*	Open Ocean	Northwestern Hawaiian islands	Kauai
Biological Resources (Continued)	<p>Navy to coordinate with local NMFS Stranding Coordinator.</p> <p>Submit report containing discussion of nature of the effects, if observed, based on both modeled results of real-time events and sightings of marine mammals. Operating area must be determined clear of marine mammals and sea turtles prior to detonation.</p> <p>Pre-exercise observation of the area to start 30 minutes before and after commencement of Demolition and Ship Mine Countermeasures Operations.</p> <p>All weapons firing would be conducted during the period 1 hour after official sunrise to 30 minutes before official sunset.</p> <p>Establish exclusion zone with a radius of 1.0 nm around each target.</p> <p>Conduct series of surveillance over-flights within exclusion and safety zones, prior to and during the exercise, when assets are available and if safe and feasible.</p> <p>Monitored exclusion zone by passive acoustic means, when assets are available.</p> <p>If a protected species observed within the exclusion zone is diving, delay firing until animal is re-sighted outside the exclusion zone, or 30 minutes have elapsed.</p> <p>Prepare after action report.</p>		

**Table ES-8. Summary of Mitigation Measures (Continued)**

Resource Category*	Open Ocean	Northwestern Hawaiian islands	Kauai
Cultural Resources	None	Within program requirements, alter missile trajectories to minimize the potential for debris to fall in the vicinity of Necker and Nihoa islands.	Avoid operations/construction in areas with known cultural resources. Monitoring all ground-disturbing activities and construction in medium and high sensitivity archaeological areas. Provide briefings about cultural resources to project personnel. Spray water on vegetation in immediate areas of launch vehicle prior to launch. Use open spray nozzle when possible to minimize erosion damage. Conduct post-burn archaeological surveys. Implement data recovery/research and documentation program. If unanticipated cultural resources are encountered (particularly human remains) during any activity, all activities will cease in the immediate vicinity of the find. Applicable procedures would be implemented and appropriate individuals contacted.
Geology and Soils	N/A	None	Navy minimizes the impact on Kaula by managing the targeting to the southeast tip of the island.
Hazardous Materials and Waste	None	None	Before any facility modifications, the areas to be modified would be surveyed for asbestos and lead-based paint.
Health and Safety	Ensure that no shipping is located within the hazard range of the longest-range weapon being fired for that event.	None	PMRF would develop and implement the necessary Standard Operating Procedures and range safety requirements necessary to provide safe operations associated with future high-energy laser tests. Appropriate remedial procedures would be taken before initiation of potentially hazardous laser operations on PMRF.
Noise	Limits have been set by DoD and OSHA to prevent damage to human hearing.	None	Limits have been set by DoD and OSHA to prevent damage to human hearing. All public, civilian, and nonessential personnel are required to be outside of ground hazard areas where expected noise levels will be below the 115 dBA limit for short-term exposure.

\*No mitigation measures have been identified for Land Use, Socioeconomics, Transportation, Utilities, or Water Resources.

**Table ES-8. Summary of Mitigation Measures (Continued)**

Resource Category*	Oahu	Maui	Hawaii
Airspace	FAA coordination would include discussions regarding the anticipated number of aircraft including FCLP operations.	None	None
Biological Resources	Mitigation measures to protect critically endangered plants include: controlling threats, improving conditions for recruitment, propagation, and reintroduction, development of Implementation Plans that outline required mitigations to offset training risks and to stabilize the targeted plant and animal populations, and implementation of a Wildland Fire Management Plan. Only sandy areas that avoid/minimize potential impacts on coral are used for explosive charges in less than 40 feet of water. Where necessary, pre-exercise surveys for turtles conducted to avoid feeding and nesting areas. Conducting surveys prior to use of amphibious launch vehicles to ensure that humpback whales are not disturbed. Beach and offshore waters are monitored for presence of marine mammals and sea turtles 1 hour before and during Major Exercises, if any are seen, exercise is delayed until the animals leave the area.	None	Impacts on rare plants minimized by locating training activities away from areas with sensitive species, fencing to enclose sensitive species for protection from ungulates, fire and fuel corridors, fire breaks, additional surveys for threatened and endangered species, and continued sensitive plant propagation efforts. All off-road driving is prohibited. All fenced areas are off-limits. All lava tubes and sinkholes are off-limits. Digging is only permitted in previously disturbed areas. Hydrographic survey is performed to map out the precise Expeditionary Assault transit routes through sandy bottom areas. Personnel entering Bradshaw Army Airfield briefed on the guidelines set forth in the PTA Ecosystem Management Plan.
Cultural Resources	In the event unanticipated cultural remains are identified (particularly human remains), all operations will cease in the immediate vicinity and appropriate military branch protocols followed.	None	In the event unanticipated cultural remains are identified (particularly human remains), all operations will cease in the immediate vicinity and appropriate military branch protocols followed.
Hazardous Materials and Waste	Training operations in the Naval Defensive Sea Area are restricted to vessels owned and operated by military and DoD personnel.	None	Before any facility modifications, the areas to be modified would be surveyed for asbestos and lead-based paint.
Health and Safety	Ensure that no shipping is located within the hazard range of the longest-range weapon being fired for that event.	None	None
Noise	Limits have been set by DoD and OSHA to prevent damage to human hearing. Personnel required to work in noise hazard areas are required to use appropriate hearing protection to bring noise levels within established safety levels. Public notification and restricting training in Waimanalo Bay to daylight hours.	None	None

\*No mitigation measures have been identified for Air Quality, Geology and Soils, Land Use, Socioeconomics, Transportation, Utilities, or Water Resources.

## Acronyms and Abbreviations

AFB	Air Force Base
ASW	Anti-Submarine Warfare
CFR	Code of Federal Regulations
COMNAVSURFPAC	Commander, Naval Surface Force, U.S. Pacific Fleet
CEQ	Council on Environmental Quality
dB	Decibel
dBA	A-Weighted Decibels
DoD	Department of Defense
DOT	Department of Transportation
EIS	Environmental Impact Statement
EO	Executive Order
EOD	Explosive Ordnance Disposal
ESA	Endangered Species Act
ESG	Expeditionary Strike Group
FCLP	Field Carrier Landing Practice
FORACS	Fleet Operational Readiness
HFA	High-Frequency Active
HRC	Hawaii Range Complex
ICRMP	Integrated Cultural Resource Management Plan
IEER	Improved Extended Echo Ranging
MCBH	Marine Corps Base Hawaii
MCTAB	Marine Corps Training Area Bellows
MFA	Mid-Frequency Active
MMPA	Marine Mammal Protection Act
NDE	National Defense Exemption
NEPA	National Environmental Policy Act
nm	Nautical Mile(s)
nm <sup>2</sup>	Square Nautical Mile(s)
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
OEIS	Overseas Environmental Impact Statement
OPAREA	Operating Area
OSHA	Occupational Safety and Health Administration
PMRF	Pacific Missile Range Facility
PTA	Pohakuloa Training Area
RDT&E	Research, Development, Test, and Evaluation
RIMPAC	Rim of the Pacific
ROD	Record of Decision
SESEF	Shipboard Electronic Systems Evaluation Facility
SPORTS	Sonar Positional Reporting System
THAAD	Terminal High Altitude Area Defense
TOA	Temporary Operating Area
U.S.	United States
U.S.C.	United States Code
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USWEX	Undersea Warfare Exercise

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