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# Executive Summary



**Supplemental Environmental Impact Statement/  
Overseas Environmental Impact Statement  
Mariana Islands Training and Testing**

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## ES Executive Summary

### ES.1 Introduction

The United States (U.S.) Department of the Navy (Navy) prepared the supplement to the May 2015 Mariana Islands Training and Testing (MITT) Final Environmental Impact Statement/Overseas EIS (EIS/OEIS) (U.S. Department of the Navy, 2015) pursuant to Council on Environmental Quality (CEQ) Regulations. The Supplemental EIS (SEIS)/OEIS considered ongoing and future activities conducted at sea and on Farallon de Medinilla (FDM), updated training and testing requirements, incorporated new information from an updated acoustic effects model, updated marine mammal density data, and incorporated evolving and emergent best available science. The SEIS/OEIS also supports the issuance of federal regulatory permits and authorizations under the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) by using the most current and best available science and analytical methods to reassess potential environmental impacts on the species applicable to those regulations. The Navy consulted with the National Marine Fisheries Service (NMFS) to renew these authorizations. While the Study Area remains unchanged from the 2015 MITT Final EIS/OEIS, the SEIS/OEIS focuses only on the at-sea and FDM portion of that area.

The 2015 MITT Final EIS/OEIS also analyzed training and testing activities conducted at existing Mariana Islands Range Complex (MIRC) land-based training areas located on Guam, Saipan, Tinian, and Rota. In accordance with 40 Code of Federal Regulations (CFR) Section 1502.9, the Navy will continue to rely on the 2015 MITT Final EIS/OEIS and the 2015 U.S. Fish and Wildlife Service consultation for land-based activities because there are no changes that are relevant to environmental concerns or that would have a bearing on the land-based activities or their impacts.

### ES.2 Purpose of and Need for Proposed Training and Testing Activities

The Navy and NMFS (as a cooperating agency) have coordinated from the outset and developed this document to meet each agency's distinct National Environmental Policy Act (NEPA) obligations and support the decision making of both agencies. The Navy's purpose of the Proposed Action is to conduct training and testing activities to ensure that the Navy, other U.S. military services, and the U.S. Coast Guard meet their respective missions, which, for the Navy under Title 10 United States Code (U.S.C.) Section 8062, is to maintain, train, and equip combat-ready military forces capable of winning wars, deterring aggression, and maintaining freedom of the seas. The respective missions are achieved in part by training and testing within the Study Area in accordance with established military readiness requirements. NMFS's purpose is to evaluate the Navy's Proposed Action pursuant to NMFS's authority under the MMPA, and to make a determination whether to issue incidental take regulations and Letters of Authorization, including any conditions needed to meet the statutory mandates of the MMPA.

### ES.3 Scope and Content of the Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement

In the SEIS/OEIS, the Navy reanalyzed at-sea and FDM training and testing activities that could potentially impact natural resources, such as marine mammals, sea turtles, and other marine resources. Since the completion of the 2015 MITT Final EIS/OEIS, new information has become available and is incorporated in the analysis, in addition to proposed changes in training and testing requirements. The range of alternatives in the SEIS/OEIS includes the No Action Alternative and two action alternatives. The Navy analyzed direct, indirect, cumulative, short-term, and long-term impacts, and the irreversible and irretrievable commitment of resources that may result from the Proposed Action. The Navy is the

lead agency for the Proposed Action and is responsible for the scope and content of the SEIS/OEIS. The document is being prepared in coordination with the U.S. Coast Guard as a cooperating agency, as its at-sea and FDM training and testing activities in the Study Area are included in the Proposed Action.

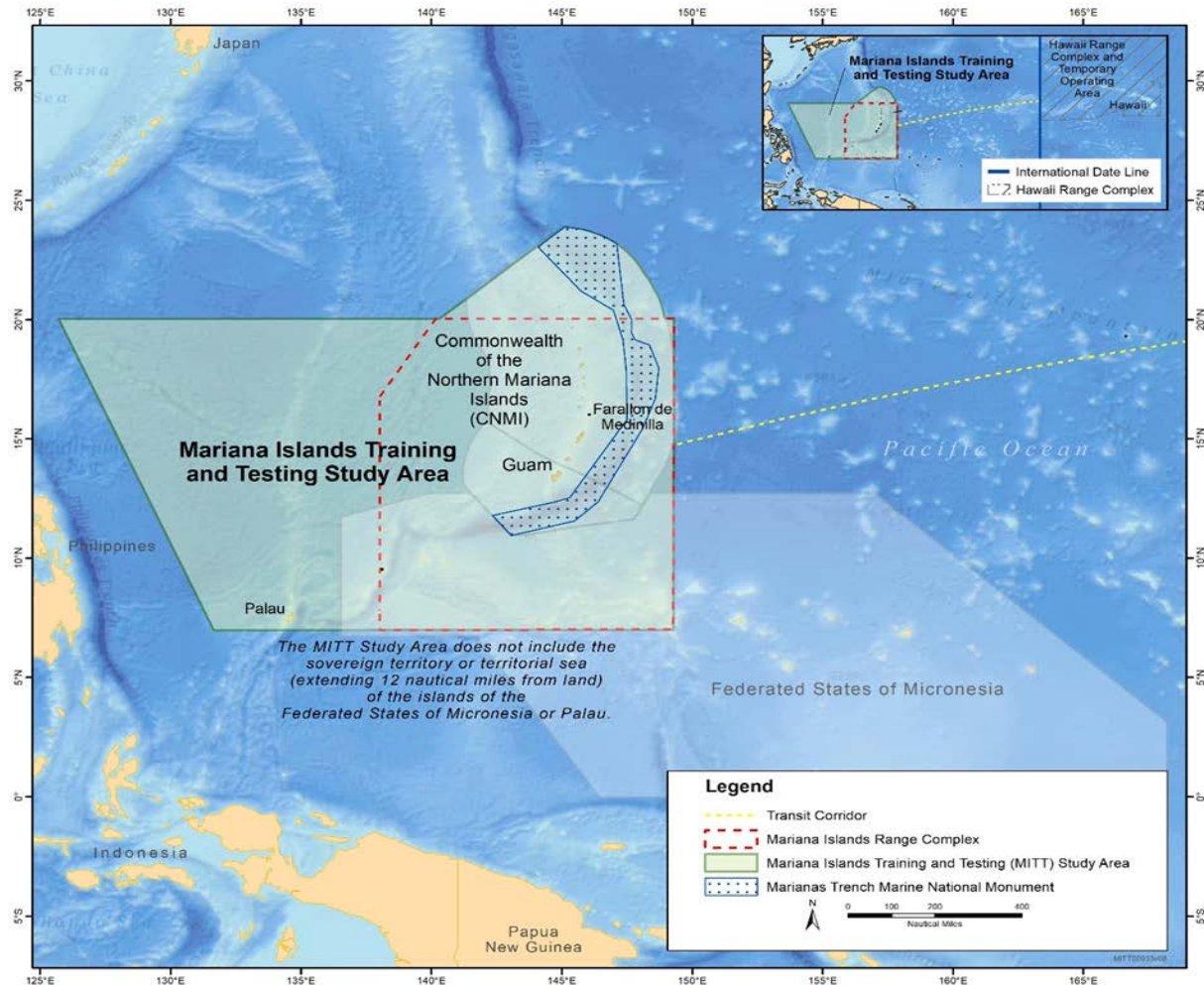
The National Oceanic Atmospheric Administration's NMFS is serving as a cooperating agency because the scope of the Proposed Action and alternatives involves activities that have the potential to impact protected resources under their jurisdiction by law, including marine mammals, threatened and endangered species, and Essential Fish Habitat. The National Oceanic Atmospheric Administration's authorities and special expertise are based on their statutory responsibilities under the MMPA of 1972, as amended (16 U.S.C. 1361 et seq.), the ESA of 1973 (16 U.S.C. 1531 et seq.), and the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.). In addition, NMFS, in accordance with 40 CFR 1506.3 and 1505.2, may adopt the SEIS/OEIS and issue a separate Record of Decision associated with its decision to grant or deny the Navy's request for an incidental take authorization pursuant to Section 101(a)(5)(A) of the MMPA.

In accordance with CEQ regulations (40 CFR 1505.2), the Navy will issue a Record of Decision that provides the rationale for choosing one of the alternatives.

#### **ES.4 Proposed Action and Alternatives**

The Navy proposes to continue military readiness training and testing activities throughout the Study Area (Figure ES.4-1), primarily in the existing MIRC. The proposed training and testing activities associated with the Proposed Action are to be conducted at sea (including the transit corridor between the MIRC and the Hawaii Range Complex, and select Navy pierside and harbor locations) and on FDM. These proposed activities are generally consistent with those at-sea and FDM activities analyzed in the 2015 MITT Final EIS/OEIS. To achieve and maintain Fleet readiness through this SEIS/OEIS, the Navy

- analyzes at-sea and FDM activities necessary to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, including any changes to those activities previously analyzed, and reflects the most up-to-date compilation of training and testing activities deemed necessary to accomplish military readiness requirements;
- adjusts types and tempo (increases or decreases) of training and testing events from the 2015 MITT Final EIS/OEIS to the level needed to meet readiness requirements beyond 2020 and into the reasonably foreseeable future;
- presents the results of the evaluation of relevant new information, which was incorporated into revised analyses where appropriate (each resource area analyzed within the 2015 MITT Final EIS/OEIS was evaluated to determine the need for reanalysis within the SEIS/OEIS);
- updates the environmental impact analyses in previous documents to account for changes to tempo of activity, renaming or combining related types of activities, acknowledging discontinuation of some activities assessed in 2015, and assessing new activities, such as those involving high-energy lasers, to enable the Navy to adopt new technology and new capabilities;
- updates environmental analyses with the best available science and most current acoustic analysis methods to evaluate the potential effects of training and testing on the marine environment; and
- supports reauthorization of incidental takes of marine mammals under the MMPA and incidental takes of threatened and endangered marine species under the ESA.



**Figure ES.4-1: Mariana Islands Training and Testing Study Area**

#### ES.4.1 No Action Alternative

Under the No Action Alternative, the Navy would not conduct the proposed training and testing activities in the MITT Study Area. Other military activities not associated with this Proposed Action would continue to occur. For FDM, the lease agreement between the U.S. government and the Commonwealth of the Northern Mariana Islands would remain in place, and the island would continue to be maintained as a Navy range, although strike warfare would no longer continue on the island. For NMFS, denial of an application for an incidental take authorization constitutes the NMFS No Action Alternative, which is consistent with NMFS' statutory obligation under the MMPA to grant or deny requests for take incidental to specified activities. The resulting environmental effects from taking no action will be compared with the effects of the action alternatives.

Cessation of proposed Navy at-sea training and testing activities would mean that the Navy would not meet its statutory requirements and would be unable to properly defend itself and the United States from enemy forces, unable to successfully detect enemy submarines, and unable to safely and effectively use its weapons systems or defensive countermeasures due to a lack of training of forces and testing of systems that replicate the conditions to which Naval forces must operate while executing the range of military operations required to further national security objectives. Navy personnel would

essentially not obtain the unique skills or be prepared to safely and effectively use sensors, weapons, and technologies in realistic scenarios required to accomplish the overall mission. Consequently, the No Action Alternative of not conducting the proposed live, at-sea training and testing activities in the Study Area is inherently unreasonable because it does not meet the purpose of and need for the Proposed Action.

#### **ES.4.2 Alternative 1**

This alternative consists of an adjustment from the level of training and testing activities analyzed in the 2015 MITT Final EIS/OEIS, accounting for changes in the types and tempo (increases or decreases) of activities necessary to meet current and future military readiness requirements beyond 2020.

- **Adjustments to Tempo of Training and Testing Activities.** This alternative includes changes to training and testing requirements necessary to accommodate current and future training and testing requirements at sea and on FDM, including new at-sea activities as well as activities subject to previous analysis that are currently ongoing and have historically occurred in the Study Area.

Alternative 1 reflects a level of training and testing activities to be conducted at sea and on FDM, with adjustments from the 2015 MITT Final EIS/OEIS that account for changes in the types and tempo of activities necessary to meet current and future military readiness requirements beyond 2020.

Alternative 1 reflects a representative year of training and testing to account for the typical fluctuation of training cycles, testing programs, and deployment schedules that generally limit the maximum level of training and testing from occurring for the reasonably foreseeable future.

#### **ES.4.3 Alternative 2 (Preferred Alternative)**

Alternative 2 includes the same type of training and testing activities that would occur under Alternative 1. Alternative 2 also includes an increase in tempo of some training and testing activities, including additional Fleet exercises and associated unit-level activities, should unanticipated emergent world events require increased readiness levels. Alternative 2 includes additional electronic warfare activities for Naval Air Systems Command and additional electronic warfare, anti-submarine warfare, and surface warfare activities for Naval Sea Systems Command. Alternative 2 reflects the maximum number of training activities that could occur within a given year, and assumes the maximum number of Fleet exercises would occur annually. This alternative allows for the greatest flexibility for the Navy to maintain readiness when considering potential changes in the national security environment, fluctuations in training and deployment schedules, and anticipated in-theater demands.

#### **ES.5 Summary of Environmental Effects**

Environmental effects which might result from implementing the Navy's Proposed Action have been analyzed in the SEIS/OEIS. Physical resources (e.g., air quality, sediments, and water quality) considered for re-evaluation in the SEIS/OEIS are the same as those that were analyzed in the 2015 MITT Final EIS/OEIS. Biological resources considered include marine habitats, marine mammals, sea turtles, marine birds, marine vegetation, marine invertebrates, fishes, and terrestrial species and habitats. Human resources considered in the SEIS/OEIS include cultural resources, socioeconomic resources and environmental justice, and public health and safety.

As stated previously, the SEIS/OEIS is an update to the 2015 MITT Final EIS/OEIS. New information specifically addressed in the SEIS/OEIS includes updates to military readiness requirements, an updated acoustic effects model, updated marine mammal density data, and evolving and emergent best available



science.<sup>1</sup> As the science regarding the potential impacts of acoustics (sonar and explosives) on marine species has evolved since the 2015 MITT Final EIS/OEIS (new research available, updated criteria and thresholds), the acoustic analysis contained in the supplement is a complete update and does not rely on the 2015 MITT Final EIS/OEIS analysis. Analysis associated with activities that result in non-acoustic impacts is updated as necessary in the SEIS/OEIS to reflect new science and refers to the 2015 MITT Final EIS/OEIS analysis when appropriate.

Table ES.5-1 lists the potential environmental impacts of the Proposed Action. All sections of the 2015 MITT Final EIS/OEIS were reviewed to determine whether there was relevant best available science that would require updates to the analysis and incorporation into the SEIS/OEIS. To the extent there was updated or new and relevant best available science, it is reflected in each of the sections in Chapter 3 (Affected Environment and Environmental Consequences). The Navy also reassessed effects determinations for marine species. Predicted acoustic exposures are reduced 25 percent under Alternative 1 and would decrease 17 percent under Alternative 2, when compared to the impacts predicted in the 2015 MITT Final EIS/OEIS.

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<sup>1</sup> The 2015 MITT Final EIS/OEIS used a new modeling system known as the Navy Acoustic Effects Model, developed by the Navy in cooperation with the National Marine Fisheries Service, and marine mammal density information that was the best available information at the time. In the SEIS/OEIS, the Navy Acoustic Effects Model has been refined, marine mammal density estimates have been updated, NMFS has published new criteria, and criteria used in the acoustic model have been revised.

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2**

Resource Category	Summary of Impacts
<p><b>Section 3.1</b> Sediments and Water Quality</p>	<p>The Navy considered all stressors that could potentially impact sediments and water quality as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing would result in fewer explosives and explosives byproducts, metals, chemicals, and other materials within the marine environment where training and testing activities have historically occurred. Discontinuing training and testing activities would reduce the potential for impacts on sediments and water quality from training and testing activities.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Explosives and explosives byproducts:</u></b> The number of explosive munitions used during at-sea training and testing activities and on FDM would increase compared to the number analyzed in the 2015 MITT Final EIS/OEIS. In addition, all munitions would be dropped on the same existing impact areas on FDM. The analysis shows that the proposed increase in ordnance use on FDM would be less than 1 percent compared to levels analyzed previously. The small increase in at-sea activities and on FDM would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS. Furthermore, chemical, physical, or biological changes in sediment or water quality would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS. Guam, CNMI, and federal standards or guidelines would not be violated.</li> <li>• <b><u>Metals:</u></b> Under Alternative 1, the number of sources of metals that would be expended during training and testing would increase compared to the 2015 MITT Final EIS/OEIS. There is no new information that changes the basis of the conclusions presented for the potential impacts of metals on sediments and water quality. Chemical, physical, or biological changes to sediments or water quality in the Study Area would not be detectable beyond the vicinity of the corroding metals and any impacts would be short term and localized. Therefore, increases in training and testing activities proposed under Alternative 1 would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS.</li> <li>• <b><u>Chemicals other than explosives:</u></b> Under Alternative 1, fewer items that would expend chemicals other than explosives (e.g., solid-fuel propellants in missiles and rockets, Otto Fuel II torpedo propellant and combustion byproducts, polychlorinated biphenyls [PCBs] in target vessels used during sinking exercises, and other chemicals associated with expended materials) would be used during training and testing activities compared to the number of items proposed in the 2015 MITT Final EIS/OEIS. Some testing activities that would introduce chemicals other than explosives into the environment would increase, while others would decrease. The changes in the number of activities that introduce chemicals other than explosives proposed under Alternative 1 would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.1</b> Sediments and Water Quality (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Other materials expended</u>: Under Alternative 1, the number of proposed training and testing activities that would introduce other materials, such as marine markers and flares, chaff, towed and stationary targets, and miscellaneous components, would increase over levels analyzed previously in the 2015 MITT Final EIS/OEIS. These materials and components are made mainly of nonreactive or slowly reactive materials (e.g., glass, carbon fibers, and plastics), or they break down or decompose into benign byproducts (e.g., rubber, steel, iron, and concrete). Increases in training and testing activities under Alternative 1 would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Explosives and explosives byproducts</u>: Activities proposed under Alternative 2 would increase the number of explosive munitions used during at-sea training and testing activities and on FDM as compared to Alternative 1 and the number analyzed in the 2015 MITT Final EIS/OEIS. As noted under Alternative 1, all munitions would be dropped on the same existing impact areas on FDM under Alternative 2. The small increase of at-sea ordnance and ordnance dropped on FDM under Alternative 2 would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS. Therefore, under Alternative 2, impacts on sediments and water quality from the use of explosives and generating explosives byproducts would be negligible.</li> <li>• <u>Metals</u>: Under Alternative 2, the number of sources of metals expended would increase as compared to the 2015 MITT Final EIS/OEIS and Alternative 1. However, these increases would have no appreciable change on the impact conclusions for metals under Alternative 1 and the 2015 MITT Final EIS/OEIS.</li> <li>• <u>Chemicals other than explosives</u>: Under Alternative 2, the number of sources that would generate chemicals other than explosives would increase as compared to Alternative 1. Impacts from chemicals other than explosives under Alternative 2 would be similar to impacts described under Alternative 1 despite a small increase in expended materials.</li> <li>• <u>Other materials expended</u>: The number of proposed training and testing activities that would introduce other expended materials would increase over levels analyzed previously in the 2015 MITT Final EIS/OEIS and as compared to Alternative 1; however, these increases would have no appreciable change on the impact conclusions presented in the 2015 MITT Final EIS/OEIS.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.2</b> Air Quality</p>	<p>The Navy considered all stressors that could potentially impact air quality as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Implementation of the No Action Alternative would mean that emissions associated with proposed training and testing activities would no longer be produced; however, there would be no measurable change in air quality conditions.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Criteria air pollutants:</u> The amount of air pollutants emitted within territorial waters and subsequently transported ashore would be minor because pollutants would be emitted over large areas (i.e., 501,873 NM<sup>2</sup>) mostly beyond 3 NM and would be substantially dispersed during transport. Increased emissions under Alternative 1 would not affect the NAAQS attainment status of the relevant air quality control regions nor impact the general public because criteria air pollutants are below <i>de minimis</i> thresholds.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Criteria air pollutants:</u> Under Alternative 2, the numbers of training and testing activities would increase over what is proposed under Alternative 1. Increased emissions however would not affect the NAAQS attainment status of the relevant air quality control regions nor impact the general public because criteria air pollutants are below <i>de minimis</i> thresholds.</li> </ul>
<p><b>Section 3.3</b> Marine Habitats</p>	<p>The Navy considered all stressors that could potentially impact marine habitats as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer explosive and physical disturbance and strike stressors within the marine environment where training and testing activities have historically occurred. Therefore, discontinuing training and testing activities would reduce the potential for explosive or physical disturbance and strike stressor impacts on marine habitat, but would not measurably improve the overall distribution or abundance of marine habitat.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.3</b> Marine Habitats (continued)</p>	<p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Explosives:</u></b> Most of the explosive military expended materials would detonate at or near the water surface. Training and testing activities that include bottom-laid in-water explosions under Alternative 1 would affect marine habitat structure in the Study Area, but these activities would occur in an area that has been previously disturbed and impacts would be localized. Mitigation measures would help the Navy avoid or reduce impacts on seafloor resources (including shallow-water coral reefs, live hard bottom, artificial reefs, and submerged cultural resources) from explosives during applicable activities.</li> <li>• <b><u>Physical Disturbance and Strike:</u></b> Vessel and in-water device strikes, military expended materials, seafloor devices, and personnel disturbance (walking, standing, or swimming in the nearshore waters during amphibious activities such as raids and assaults) could disturb bottom substrates. However, the impact of physical disturbance and strike stressors on marine habitats would remain inconsequential because (1) vessel and in-water activities that could come into contact with marine substrates would be located in previously disturbed areas (i.e., nearshore shallow waters), (2) military expended materials could be colonized by benthic organisms, and (3) seafloor devices would be used predominantly in previously disturbed areas and therefore would not be expected to affect marine substrates.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Explosives:</u></b> The number of explosives are proposed to be the same as under Alternative 1 and increase compared to the 2015 MITT Final EIS/OEIS. However, proposed increases would have no appreciable change on the impact conclusions as described under Alternative 1.</li> <li>• <b><u>Physical Disturbance and Strike:</u></b> Proposed increases in some physical disturbance and strike stressors, such as military expended materials, could increase the impact risk on marine habitats but would have no appreciable change on the impact conclusions as described under Alternative 1, or impact conclusions presented in the 2015 MITT Final EIS/OEIS.</li> </ul>
<p><b>Section 3.4</b> Marine Mammals</p>	<p>The Navy considered all stressors that could potentially impact marine mammals as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect marine mammals. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on marine mammals, but would not measurably improve the overall habitat, distribution, or abundance of marine mammals.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.4</b> Marine Mammals (continued)</p>	<p><b>Alternative 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Acoustics:</b> Navy training and testing activities have the potential to expose marine mammals to multiple acoustic stressors. Exposures to sound-producing activities present risks to marine mammals that could include temporary or permanent hearing threshold shift, auditory masking, physiological stress, or behavioral responses. Individual animals would typically experience only a small number of behavioral responses or temporary hearing threshold shifts per year due to exposure to acoustic stressors, and these are very unlikely to lead to any costs or long-term consequences for individuals or populations.</li> <li>• <b>Explosives:</b> Explosions in the water or near the water’s surface present a risk to marine mammals located in proximity to the explosion because the resulting shock waves could cause injury or result in the death of an animal. There are, however, no mortalities predicted by the analysis. If a marine mammal is farther from an explosion, the impulsive, broadband sounds introduced into the marine environment may cause a temporary or permanent threshold shift, auditory masking, physiological stress, or behavioral responses. Population-level effects on marine mammals are unlikely because most estimated impacts from explosions are behavioral responses or temporary threshold shifts, and the number of marine mammals potentially impacted by explosives are small compared to each species’ respective abundance.</li> <li>• <b>Energy:</b> Navy training and testing activities have the potential to expose marine mammals to electromagnetic fields or high-energy lasers as energy stressors. The likelihood and magnitude of energy impacts depend on the proximity of marine mammals to energy stressors. Based on the relatively weak strength of the electromagnetic field created by some Navy activities, a marine mammal would have to be in close proximity for there to be any effect. Impacts on marine mammal migrating behaviors and navigational patterns are not anticipated. Statistical probability analyses with conservative assumptions (tending to overestimation of exposures) demonstrate with a high level of certainty that a marine mammal would not be struck by a high-energy laser. These activities are temporary and localized in nature, and may result in short-term and minor impacts on individual marine mammals, but would not result in long-term impacts on marine mammal populations.</li> <li>• <b>Physical Disturbance and Strike:</b> Marine mammals would potentially be exposed to multiple physical disturbance and strike stressors associated with Navy training and testing activities. Historical data indicate no occurrence of vessel strikes with marine mammals in the MITT Study Area over the last 10 years during any training and testing activities. Since the Navy does not anticipate a substantive change in the level of vessel use compared to the last decade, the potential for striking a marine mammal is not expected. Physical disturbance of individual marine mammals due to vessel movement and in-water devices may occur, but any stress response or avoidance behavior would not be severe enough to have long-term fitness consequences on individual marine mammals. The use of in-water devices during Navy activities involves multiple types of vehicles or towed devices traveling on the water surface, through the water column, or along the seafloor, all of which have</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.4</b> Marine Mammals (continued)</p>	<p>the potential to physically disturb or strike marine mammals. No recorded or reported instances of marine mammal strikes have resulted from in-water devices; therefore, impacts on individuals or long-term consequences to marine mammal populations are not anticipated. Potential impacts from military expended materials and seafloor devices are determined through statistical probability analyses. Analyses suggest a very low potential for marine mammals to be struck by these items. Long-term consequences on marine mammal populations from physical disturbance and strike associated with the use of vessels, in-water devices, military expended materials, and seafloor devices during training and testing activities are not anticipated.</p> <ul style="list-style-type: none"> <li>• <u>Entanglement</u>: Marine mammals could be exposed to multiple entanglement sources associated with Navy training and testing activities. The potential for impacts is dependent on the probability that a marine mammal would encounter an expended material, as well as the physical properties of the expended materials and the likelihood that a marine mammal could become entangled in the item. Physical characteristics of cables, wires, and decelerators/parachutes suggest that it is not likely a marine mammal would become entangled in these items. While it may be possible for a marine mammal to become entangled in cables or wires, the sparse distribution of these items throughout the Study Area indicates a very low potential for encounter. Furthermore, fiber optic cables used during mine warfare activities are easily abraded and have a low breaking strength, which reduces the risk of entanglement should a cable be encountered. Short-term impacts on individual marine mammals and long-term impacts on marine mammal populations from entanglement are not anticipated.</li> <li>• <u>Ingestion</u>: Navy training and testing activities have the potential to expose marine mammals to ingestion impacts from multiple sources. The potential for impacts relies heavily on feeding behaviors of marine mammals that occur in the Study Area, the physical properties of the expended items, the feasibility that a marine mammal could ingest the items, and the likelihood that a marine mammal would encounter an item. Marine mammals that forage along the water surface or within the water column are less likely to encounter ingestion stressors as they sink through the water column to the seafloor. Most expended materials that would remain floating or suspended within the water column are typically too small to pose a risk of intestinal blockage to any marine mammal that encounters it. Bottom-feeding marine mammals would be more likely to encounter expended materials that have already sunk to the floor. In the unlikely event that a marine mammal encounters and ingests expended material, the individual might be negatively affected if the material becomes lodged in the digestive tract. The likelihood that a marine mammal would ingest a military expended item associated with training and testing activities is considered low. Long-term consequences to marine mammal populations from expended materials associated with training and testing activities are not anticipated.</li> <li>• <u>Secondary</u>: Marine mammals would be exposed to secondary stressors associated with training and testing activities in the Study Area. In-water explosions have the potential to injure or kill prey species that marine mammals feed on; however, impacts would not substantially impact prey availability. Explosion byproducts are not considered as indirect stressors to</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.4</b> Marine Mammals (continued)</p>	<p>marine mammals while mixed in marine sediments or water. Explosion byproducts and unexploded munitions would have no lasting or meaningful effect on water quality and would therefore not constitute a secondary indirect stressor for marine mammals. Metals are introduced into the water and sediments from targets, munitions, and other expended materials. Evidence from a number of studies indicate metal contamination is localized and ephemeral, and bioaccumulation resulting from munitions was not observed in the studies specifically designed to look for bioaccumulation. Therefore, it is unlikely that impacts on marine mammal prey availability would occur. Several training and testing activities introduce explosive byproducts into the marine environment that are potentially harmful in concentration; however, rapid dilution would occur and toxic concentrations would not likely be encountered. Furthermore, there is no evidence of acute toxicity or chronic accumulation of chemicals introduced by Navy activities that would alter water quality to an extent that would result in overall habitat degradation for marine mammals. Transmission of diseases and parasites are not considered likely from the Navy’s trained marine mammals because strict protocols are in place to prevent such impacts on wild populations. Secondary stressors from training and testing activities in the Study Area are not expected to have short-term impacts on individual marine mammals or long-term impacts on marine mammal populations.</p> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Acoustics:</u></b> Potential impacts on marine mammals would be similar to those discussed for training and testing activities under Alternative 1. The only difference in sonar and other transducer use between Alternatives 1 and 2 is that the number of sonar hours used would be greater under Alternative 2. Potential impacts resulting from vessel noise would be similar to those discussed for activities under Alternative 1. The only difference in weapons noise impacts between Alternatives 1 and 2 is that the number of munitions used would be greater under Alternative 2. While the types of expected impacts on any individual marine mammal would remain the same, more animals could be affected.</li> <li>• <b><u>Explosives:</u></b> The locations and number of events involving explosives that could impact marine mammals would increase under Alternative 2 compared to Alternative 1 and the 2015 MITT Final EIS/OEIS. However, this increase would have no appreciable change on the impact conclusions described under Alternative 1.</li> <li>• <b><u>Energy:</u></b> The locations, number of events, and potential effects associated with energy stressors would be the same under Alternatives 1 and 2. Under Alternative 2, the use of high-energy lasers would increase as compared to Alternative 1. There would be no change regarding the impact conclusions for energy stressors under Alternative 1 and the 2015 MITT Final EIS/OEIS.</li> <li>• <b><u>Physical Disturbance and Strike:</u></b> Under Alternative 2, potential physical disturbance and strike impacts on marine mammals associated with training and testing activities would be similar to those discussed for activities under Alternative 1. There</li> </ul>



**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.4</b> Marine Mammals (continued)</p>	<p>would be a small increase in vessel and in-water device use in the Study Area. However, the difference would not result in substantive changes to the potential for or types of impacts on marine mammals.</p> <ul style="list-style-type: none"> <li>• <u>Entanglement</u>: There would be an increase in the number of military expended materials associated with Alternative 2 activities. However, the increase is negligible, and the potential impacts from wires and cables and decelerators/parachutes under Alternative 2 would be similar to that of Alternative 1.</li> <li>• <u>Ingestion</u>: Under Alternative 2, the locations and types of military expended materials used would be the same as those of Alternative 1. There would be an increase in the number of some items expended. However, the increase in the total number of items expended would not be expected to result in substantive changes to the type or degree of impacts on marine mammals.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors on marine mammals resulting from Alternative 2 activities would be the same as those described under Alternative 1. Secondary stressors from training and testing activities in the Study Area are not expected to have short-term impacts on individual marine mammals or long-term impacts on marine mammal populations.</li> </ul>
<p><b>Section 3.5</b> Sea Turtles</p>	<p>The 2015 MITT Final EIS/OEIS analyzed potential impacts of at-sea training and testing activities, as well as amphibious landings on training beaches on Guam and within the CNMI, which may support sea turtle nesting. Activities on Guam, Rota, and Tinian are not proposed to change; therefore, the SEIS/OEIS only addresses potential stressors on sea turtles for training and testing activities at sea.</p> <p>The Navy considered all stressors that could potentially impact sea turtles as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing the training and testing activities would result in fewer stressors that potentially affect sea turtles within the marine environment where training and testing have historically occurred. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on sea turtles, but would not measurably improve the status of sea turtle populations.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Navy training and testing activities have the potential to expose sea turtles to multiple acoustic stressors. Exposures to sound-producing activities present risks to sea turtles that could include temporary or permanent hearing threshold shift, auditory masking, physiological stress, or behavioral responses. Individual sea turtles would typically</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.5</b> Sea Turtles (continued)</p>	<p>experience only a small number of behavioral responses or temporary hearing threshold shifts per year due to exposure to acoustic stressors, and these are very unlikely to lead to any costs or long-term consequences for individuals or populations.</p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: Explosions in the water or near the water’s surface present a risk to sea turtles located near the explosion because the resulting shock waves can cause injury or result in the death of an animal. If a sea turtle is farther from an explosion, the impulsive, broadband sounds introduced into the marine environment may cause a temporary or permanent threshold shift, auditory masking, physiological stress, or behavioral responses. Due to the low numbers of sea turtles anticipated to be in locations where explosives at sea are expended, impacts are unlikely to occur. Lower-NEW explosives were analyzed for potential impacts on sea turtles within nearshore habitats of Guam. Potential impacts resulting from these activity types are anticipated to be few, if any, due to the fact that other stressor types occur before nearshore explosives occur (such as small vessel movements and other activities on or above the water) that would likely induce sea turtles to leave the area.</li> <li>• <u>Energy</u>: In-water electromagnetic devices are not expected to result in population-level impacts for sea turtles due to the low intensity, localized potential impact area, and short duration of use. The use of high-energy lasers associated with training and testing activities is not expected to impact sea turtles as a result of the very low probability of a strike by a high-energy laser.</li> <li>• <u>Physical Disturbance and Strike</u>: Sea turtles would potentially be exposed to multiple physical disturbance and strike stressors associated with Navy training and testing activities. The potential for impacts relies heavily on the probability that sea turtles would be in close proximity to an activity (e.g., a vessel or an expended non-explosive munition). Green sea turtles and hawksbill sea turtles occur inside or within proximity to port locations where vessel movements would be most frequent. Use of vessels and in-water devices, military expended materials, and seafloor devices may cause short-term disturbance to an individual turtle within the Study Area. However, due to the low numbers of sea turtles anticipated to be in locations where these items are expended, impacts are unlikely to occur.</li> <li>• <u>Entanglement</u>: Sea turtles could be exposed to multiple entanglement sources associated with Navy training and testing activities. The potential for impacts is dependent on the probability that a sea turtle would encounter an expended material, the physical properties of the expended materials, and the likelihood that a sea turtle could become entangled in the item. Physical characteristics of cables, wires, and decelerators/parachutes suggest it is unlikely a sea turtle would become entangled in these items. While it may be possible for a sea turtle to become entangled in cables or wires, the sparse distribution of these items throughout the Study Area indicates a very low potential for encounter. Furthermore, fiber optic cables used during mine warfare activities are easily abraded and have a low breaking strength, which reduces the risk of entanglement should a cable be encountered.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.5</b> Sea Turtles (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Ingestion</u>: Navy training and testing activities have the potential to expose sea turtles to ingestion impacts from multiple sources. The potential for impacts relies heavily on feeding behaviors of different sea turtle species that occur in the Study Area, the physical properties of the expended items, the feasibility that a sea turtle could ingest the items, and the likelihood that a sea turtle would encounter an item. Sea turtles that forage along the water surface or within the water column are less likely to encounter ingestion stressors as they sink through the water column to the seafloor. Most expended materials that would remain floating or suspended within the water column are typically too small to pose a risk of intestinal blockage to any sea turtle that encounters it. Bottom-feeding sea turtles would be more likely to encounter expended materials that have already sunk to the sea floor if the floor is within the dive depth of a particular sea turtle species. In the unlikely event that a sea turtle encounters and ingests expended material, the individual might be negatively affected if the material becomes lodged in the digestive tract. The likelihood that a sea turtle would ingest a military expended item associated with training and testing activities is considered low.</li> <li>• <u>Secondary</u>: Sea turtles would be exposed to secondary stressors associated with training and testing activities in the Study Area. In-water explosions have the potential to injure or kill prey species that some sea turtle species feed on; however, impacts would not substantially impact prey availability. Metals are introduced into the water and sediments from targets, munitions, and other expended materials. Evidence from several studies indicate metal contamination is localized and ephemeral, and bioaccumulation resulting from munitions was not observed in the studies specifically designed to look for bioaccumulation. Therefore, it is unlikely that impacts on sea turtle prey availability would occur. Furthermore, there is no evidence of acute toxicity or chronic accumulation of chemicals introduced by Navy activities that would alter water quality to an extent that would result in overall habitat degradation for sea turtles.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Potential impacts on sea turtles would be similar to those discussed for training and testing activities under Alternative 1. The only difference in sonar and other transducer use between Alternatives 1 and 2 is that the number of sonar hours used would be greater under Alternative 2. Potential impacts resulting from vessel noise would be similar to those discussed for activities under Alternative 1. The only difference in weapons noise impacts between Alternatives 1 and 2 is that the number of munitions used would be greater under Alternative 2. While the types of expected impacts on any individual sea turtle would remain the same, more animals could be affected.</li> <li>• <u>Explosives</u>: The locations and number of events involving explosives would increase under Alternative 2 compared to Alternative 1 and the 2015 MITT Final EIS/OEIS. However, this increase would have no appreciable change on the impact conclusions described under Alternative 1.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.5</b> Sea Turtles (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Energy</u>: The locations, number of events, and potential effects associated with energy stressors would be the same under Alternatives 1 and 2. Under Alternative 2, the use of high-energy lasers would increase as compared to Alternative 1. There would be no change regarding the impact conclusions described under Alternative 1 and the 2015 MITT Final EIS/OEIS.</li> <li>• <u>Physical Disturbance and Strike</u>: Under Alternative 2, potential physical disturbance and strike impacts on sea turtles associated with training and testing activities would be similar to Alternative 1. There would be a small increase in vessel and in-water device use in the Study Area. However, the difference would not result in substantive changes to the potential for or types of impacts on sea turtles.</li> <li>• <u>Entanglement</u>: There would be an increase in the number of military expended materials associated with Alternative 2 activities. However, the increase is negligible and the potential impacts from wires and cables and decelerators/parachutes under Alternative 2 would be similar to Alternative 1.</li> <li>• <u>Ingestion</u>: Under Alternative 2, the locations and types of military expended materials used would be the same as Alternative 1. There would be an increase in the number of some items expended. However, the increase in the total number of items expended would not be expected to result in substantive changes to the type or degree of impacts on sea turtles.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors on sea turtles resulting from Alternative 2 activities would be nearly identical to Alternative 1.</li> </ul>
<p><b>Section 3.6</b> Marine Birds</p>	<p>The Navy considered all stressors that could potentially impact marine birds as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect marine birds. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on marine birds, but would not measurably improve the status of marine bird populations.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Navy training and testing activities have the potential to expose marine birds to multiple acoustic stressors, such as sonar and other transducers, vessel noise, aircraft noise, and weapons noise. Birds are less susceptible to both temporary or permanent hearing threshold shifts relative to other marine species because birds have adaptations to protect the middle</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.6</b> Marine Birds (continued)</p>	<p>ear and tympanum from pressure changes during diving that may affect hearing. Therefore, the likelihood of a diving bird experiencing an underwater exposure to sonar or other transducer that could result in an impact on hearing is considered low. In-air noise was analyzed for potential impacts on birds in at-sea areas and on FDM. Training and testing activities on FDM would not significantly impact populations of marine birds on the island. This conclusion is based on statistical analysis of periodic population counts of masked, brown, and red-footed boobies by the Navy from 1998 through 2016, and the relatively small increases in the number of events, munitions, and NEW expended on FDM proposed under Alternative 1 compared to what was analyzed in the 2015 MITT Final EIS/OEIS.</p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: Explosions in the water or near the water’s surface present a risk to marine birds located near the explosion because the resulting shock waves can cause injury or result in the death of an animal. Potential exposure to stressors associated with ordnance use would increase under Alternative 1 compared to the 2015 MITT Final EIS/OEIS. Factors that limit the potential for additional adverse impacts, however, include maintaining the same ordnance type and targeting restrictions included in the 2015 MITT Final EIS/OEIS and 2015 USFWS Biological Opinion. All ordnance expended on FDM would target existing impact zones, with the same ordnance restrictions imposed on all FDM activities and with the same avoidance and minimization measures in place.</li> <li>• <u>Physical Disturbance and Strike</u>: Navy training and testing activities have the potential to expose marine birds to multiple physical disturbance and strike stressors. In at-sea environments, the risk for marine birds is low because of the wide dispersal of training and testing activities throughout the Study Area. On FDM, where intensive military training and testing activities occur on an island that supports important marine bird rookery locations, the Navy analyzed munitions use and wildfires for potential impacts on marine birds. Factors that limit the potential for additional adverse impacts from physical disturbance and strike, however, include maintaining the same ordnance type and targeting restrictions included in the 2015 MITT Final EIS/OEIS. All ordnance expended on FDM would target existing impact zones, with the same ordnance restrictions imposed on all FDM activities and with the same avoidance and minimization measures in place. Recent relocation of target positions from the cliff to inland portions within impact zones further reduces potential impacts on marine bird rookeries on FDM.</li> <li>• <u>Secondary</u>: Marine birds would be exposed to multiple secondary stressors associated with training and testing activities in the Study Area. In-water explosions have the potential to injure or kill prey species that marine bird species feed on; however, impacts would not substantially impact prey availability. Metals are introduced into the water and sediments from targets, munitions, and other expended materials. Evidence from several studies indicate metal contamination is localized and ephemeral, and bioaccumulation resulting from munitions was not observed in the studies specifically designed to look for bioaccumulation. Therefore, it is unlikely that impacts on marine bird prey availability would occur. Furthermore, there is</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.6</b> Marine Birds (continued)</p>	<p>no evidence of acute toxicity or chronic accumulation of chemicals introduced by Navy activities that would alter water quality to an extent that would result in overall habitat degradation for marine birds.</p> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Potential impacts on marine birds would be similar to those discussed for training and testing activities under Alternative 1. The only difference in sonar and other transducer use between Alternatives 1 and 2 is that the number of sonar hours used would be greater under Alternative 2. Potential impacts resulting from vessel noise would be similar to those under Alternative 1. The only difference in weapons noise impacts between Alternatives 1 and 2 is that the number of munitions used would be greater under Alternative 2. While the types of expected impacts on any individual marine bird would remain the same, more animals could be affected.</li> <li>• <u>Explosives</u>: The locations and number of events involving explosives that could impact marine birds would increase under Alternative 2 compared to Alternative 1 and the 2015 MITT Final EIS/OEIS. However, this increase would not have no appreciable change on the impact conclusions described under Alternative 1.</li> <li>• <u>Physical Disturbance and Strike</u>: Under Alternative 2, potential physical disturbance and strike impacts on marine birds associated with training and testing activities would be similar to those discussed for activities under Alternative 1. There would be a small increase in vessel and in-water device use in the Study Area. However, the difference would not result in substantive changes to the potential for or types of impacts on marine birds.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors on marine birds resulting from Alternative 2 activities would be nearly identical to those described under Alternative 1.</li> </ul>
<p><b>Section 3.7</b> Marine Vegetation</p>	<p>The Navy considered all stressors that could potentially impact marine vegetation as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect marine vegetation within the marine environment. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on marine vegetation, but would not measurably improve the status of populations or subpopulations.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: Explosives could affect vegetation by destroying or removing marine vegetation; however, the use of explosives</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.7</b> Marine Vegetation (continued)</p>	<p>is not expected to impact the long-term survival, annual reproductive success, and lifetime reproductive success of marine vegetation.</p> <ul style="list-style-type: none"> <li>• <u>Physical Disturbance and Strike</u>: Physical disturbance and strike could affect vegetation by destroying individuals or damaging parts of individuals; however, physical disturbance and strike impacts on marine vegetation under Alternative 1 would be negligible.</li> <li>• <u>Secondary</u>: Stressors from Navy training and testing activities could pose secondary or indirect impacts on marine vegetation via habitat, sediment, or water quality. Potential impacts on marine vegetation exposed to secondary stressors could occur indirectly through sediments and water quality. Explosive ordnance could loosen the soil on FDM and runoff from surface drainage areas containing soil, and explosive byproducts could contaminate sediments and the surrounding ocean water.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: The locations and number of events involving explosives that could impact marine vegetation would increase under Alternative 2 compared to Alternative 1 and the 2015 MITT Final EIS/OEIS. However, this increase would have no appreciable change on the impact conclusions described under Alternative 1.</li> <li>• <u>Physical Disturbance and Strike</u>: Although impacts from physical disturbance and strike under Alternative 2 would increase slightly compared to those of Alternative 1 because of a small increase in proposed activities, physical disturbance and strike impacts on marine vegetation under Alternative 2 would also be negligible.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors under Alternative 2 would increase slightly compared to those of Alternative 1 because of a small increase in activities and expended materials, but the difference would not result in substantive changes to the marine environment.</li> </ul>
<p><b>Section 3.8</b> Marine Invertebrates</p>	<p>The Navy considered all stressors that could potentially impact marine invertebrates as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect marine invertebrates within the marine environment. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on marine invertebrates, but would not measurably improve the status of invertebrate populations or subpopulations.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.8</b> Marine Invertebrates (continued)</p>	<p><b>Alternative 1:</b></p> <ul style="list-style-type: none"> <li> <p><b>Acoustics:</b> Marine invertebrates throughout the Study Area may be exposed to non-impulse sounds generated by low-, mid-, and high-frequency sonar and other acoustic sources, vessel noise, and aircraft noise during training and testing activities. Acoustic impacts on marine invertebrates under Alternative 1 would be inconsequential because most marine invertebrates would not be close enough to intense sound sources. Any marine invertebrate capable of sensing sound may alter its behavior and become disoriented due to masking of relevant environmental sounds if exposed to non-impulsive sound, although it is unknown if responses to non-impulsive sounds occur. Continuous noise, such as from vessels, may also contribute to masking of relevant environmental sounds. Because the distance over which most marine invertebrates are expected to detect any sound is limited and vessels would be in transit, any sound exposures with the potential to cause masking or behavioral responses would last only minutes. Furthermore, invertebrate species have their best sensitivity to sound below 1 kilohertz and would not be capable of detecting the majority of sonars and other acoustic sources used in the Study Area. Therefore, non-impulsive sounds associated with Alternative 1 are not expected to impact the majority of marine invertebrates or cause more than a short-term behavioral disturbance (e.g., change in orientation or swim speeds) to those capable of detecting nearby sound. No population-level impacts on the survival, growth, recruitment, or reproduction of populations are expected under Alternative 1.</p> </li> <li> <p><b>Explosives:</b> Most explosions at the water surface would not injure benthic marine invertebrates because of the great water depth in areas where most explosives would be used. Explosions would likely kill or injure nearby marine invertebrates. Effects could include physical disturbance, fragmentation, or mortality to sessile organisms and pelagic larvae. If corals are present in areas overlapping with other training and testing activities using explosives, sessile shallow-water corals, hard-bottom, and deep-water corals, as well as eggs, sperm, early embryonic stages, and planula larvae of corals could be impacted. Consequences of exposure to an explosive shock wave could include breakage, injury, or mortality. Many corals and hard bottom invertebrates are sessile, fragile, and particularly vulnerable. No long-term impacts are expected because exposures to explosive shock waves are brief, limited in number, and spread over a large area. Explosives may impact individuals and groups of marine invertebrates, but are unlikely to impact populations or subpopulations. Therefore, impacts on marine invertebrates under Alternative 1 from explosives would be negligible.</p> </li> <li> <p><b>Energy:</b> High-energy lasers are designed to disable surface targets, rendering them immobile. The primary concern is the potential for an invertebrate to be struck with the laser beam at or near the water's surface, where extended exposure could result in injury or death. Little information exists about marine invertebrates' susceptibility to electromagnetic fields. Most corals are thought to use water temperature, day length, lunar cycles, and tidal fluctuations as cues for spawning. Magnetic fields are not known to influence coral spawning or larval settlement. Most marine invertebrates are not susceptible to laser exposure because they occur beneath the sea surface. Under Alternative 1, the number of proposed</p> </li> </ul>



**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.8</b> Marine Invertebrates (continued)</p>	<p>training and testing activities involving the use of in-water electromagnetic devices would decrease in comparison to the 2015 MITT Final EIS/OEIS. The activities would occur in the same locations and in a similar manner as were analyzed previously. Therefore, impacts on marine invertebrates under Alternative 1 from in-water electromagnetic devices would be negligible.</p> <ul style="list-style-type: none"> <li>• <u>Physical Disturbance and Strike</u>: The impact of physical disturbance and strike stressors on marine invertebrates is likely to cause injury or mortality to individuals, such as corals on nearshore reefs, but impacts on populations would be negligible because (1) the area exposed to the stressor is extremely small (localized) relative to most marine invertebrates’ ranges, and (2) the activities are dispersed such that few individuals could conceivably be exposed to more than one event. Activities involving vessels and in-water devices, military expended materials, seafloor devices, and personnel disturbance are not expected to yield behavioral changes or lasting effects on the survival, growth, recruitment, or reproduction of invertebrate species at the population level. However, the combined consequences of all physical disturbance and strike stressors could degrade habitat quality at some locations, to some degree. Combat swimmers and Marines may be required to walk through nearshore areas and reefs, potentially damaging coral species. These activities could cause injury or mortality to individuals, but impacts on marine invertebrate populations, including ESA-listed corals, are unlikely. Therefore, under Alternative 1, impacts on marine invertebrates from the use of vessels and in-water devices, military expended materials, and seafloor devices would be negligible.</li> <li>• <u>Entanglement</u>: Entanglement stressors that may impact marine invertebrates include (1) fiber optic cables and guidance wires, and (2) decelerators/parachutes. The impact of fiber optic cables, guidance wires, and decelerators/parachutes on marine invertebrates is not likely to cause injury or mortality to individuals, and impacts would be negligible because (1) the area exposed to the stressor is extremely small (localized) relative to most marine invertebrates’ ranges, (2) the activities are dispersed such that few individuals could conceivably be exposed to more than one activity, and (3) marine invertebrates are not particularly susceptible to entanglement stressors. Activities involving cables, guidance wires, and decelerators/parachutes are not expected to yield behavioral changes or lasting impacts on the survival, growth, recruitment, or reproduction of invertebrate species at individual or population levels. Therefore, impacts on marine invertebrates from entanglement stressors under Alternative 1 would be negligible.</li> <li>• <u>Ingestion</u>: Most military expended materials and fragments of military expended materials are too large to be ingested by marine invertebrates. The potential for marine invertebrates to encounter fragments of ingestible size increases as the materials degrade into smaller fragments. The increase in military expended materials, primarily from small-caliber projectiles, would not represent an ingestion risk for marine invertebrates. Only a small fraction would be of ingestible size, or become ingestible after degradation; while those may impact individual marine invertebrates, such as ESA-listed corals,</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.8</b> Marine Invertebrates (continued)</p>	<p>they are unlikely to impact populations. Therefore, impacts on marine invertebrates from ingestion of military expended materials under Alternative 1 would be negligible.</p> <ul style="list-style-type: none"> <li>• <u>Secondary</u>: Potential impacts on marine invertebrates exposed to stressors could occur indirectly through sediments and water quality. Stressors from Navy training and testing activities could pose secondary or indirect impacts on marine invertebrates via habitat, sediment, or water quality. Components of these stressors that could pose indirect impacts include (1) explosives and byproducts; (2) metals; (3) chemicals; and (4) other materials such as targets, chaff, and plastics. Impacts on marine invertebrates, including zooplankton, eggs, and larvae, are likely within a very small radius of the ordnance (1–6 ft. [0.3–1.8 m]). These impacts may continue as the ordnance degrades over months to decades. Because most ordnance is deployed as projectiles, multiple unexploded or low-order detonations would accumulate on spatial scales of 1 to 6 ft. (0.3 to 1.8 m.); therefore, potential impacts are likely to remain local and widely separated. Given these conditions, the possibility of population-level impacts on marine invertebrates is negligible. Concentrations of metals in water are extremely unlikely to be high enough to cause injury or mortality to marine invertebrates; therefore, indirect impacts of metals via water are likely to be negligible and not detectable. Marine invertebrates could be indirectly impacted by chemicals from plastics but, absent bioaccumulation, these impacts would be limited to direct contact with the material because relatively few military expended materials contain plastics. Therefore, population-level impacts on marine invertebrates attributable to Navy-expended materials are likely to be negligible and not detectable.</li> </ul> <p><b>Alternative 2 (Preferred Alternative):</b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Under Alternative 2, increases in the number of sonar hours would have no appreciable change on the impact conclusions described for acoustic stressors under Alternative 1 and the 2015 MITT Final EIS/OEIS. Therefore, acoustic impacts on marine invertebrates under Alternative 2 would be negligible.</li> <li>• <u>Explosives</u>: Under Alternative 2, increases in the number of underwater explosives would have no appreciable change on the impact conclusions described for explosive stressors under Alternative 1 and the 2015 MITT Final EIS/OEIS. Therefore, impacts on marine invertebrates under Alternative 2 from explosives would be negligible.</li> <li>• <u>Energy</u>: The locations, number of events, and potential effects would be the same under Alternatives 1 and 2. Therefore, impacts on marine invertebrates under Alternative 2 from in-water electromagnetic devices would be negligible.</li> <li>• <u>Physical Disturbance and Strike</u>: Impacts on marine invertebrates would be inconsequential for the same reasons as Alternative 1, and there would have no appreciable change on the impact conclusions described for physical disturbance and strike stressors under Alternative 1 and in the 2015 MITT Final EIS/OEIS. Therefore, under Alternative 2, impacts on marine invertebrates from the use of vessels and in-water devices, military expended materials, and seafloor devices would be negligible.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.8</b> Marine Invertebrates (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Entanglement</u>: Training and testing activities involving fiber optic cables, guidance wires, and decelerators/parachutes are not expected to yield behavioral changes or lasting impacts on the survival, growth, recruitment, or reproduction of invertebrate species at individual or population levels for the same reasons as Alternative 1. Therefore, impacts on marine invertebrates from entanglement stressors under Alternative 2 would be negligible.</li> <li>• <u>Ingestion</u>: Under Alternative 2, the combined number of ingestion stressors would increase compared to Alternative 1. However, these increases would have no appreciable change on the impact analysis or conclusions described under Alternative 1 and in the 2015 MITT Final EIS/OEIS. Therefore, impacts on marine invertebrates from ingestion of military expended materials under Alternative 2 would be negligible.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors on invertebrates resulting from activities under Alternative 2 would be nearly identical to those described under Alternative 1.</li> </ul>
<p><b>Section 3.9</b> Fishes</p>	<p>The Navy considered all stressors that could potentially impact fishes as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect fishes. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on fishes, but would not measurably improve the status of fish populations or subpopulations.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: The use of sonar and other transducers, vessel noise, aircraft noise, and weapons noise could impact fishes in the Study Area. Some sonars and other transducers, vessel noise, and weapons noise could result in hearing loss, masking, physiological stress, or behavioral reactions. Aircraft noise would not likely result in impacts other than brief, mild behavioral responses in fishes close to the surface. Most impacts, such as masking or behavioral reactions, are expected to be temporary and infrequent, as most activities involving acoustic stressors would be at low levels of noise, temporary, localized, and infrequent. More severe impacts such as mortality or injury could lead to permanent or long-term consequences for individuals, but overall, long-term consequences for fish populations are not expected.</li> <li>• <u>Explosives</u>: The use of explosives could result in impacts on fishes within the Study Area. Sound and energy from explosions are capable of causing mortality, injury, hearing loss, masking, physiological stress, or behavioral responses. The time scale of individual explosions is very limited, and training and testing activities involving explosions are dispersed in space and</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.9</b> Fishes (continued)</p>	<p>time. Therefore, repeated exposure of individual fishes is unlikely. Most effects such as hearing loss or behavioral responses are expected to be short term and localized. More severe impacts such as mortality or injury could lead to permanent or long-term consequences for individuals, but overall, long-term consequences for fish populations are not expected.</p> <ul style="list-style-type: none"> <li>• <u>Energy</u>: The use of in-water electromagnetic devices may elicit brief behavioral or physiological stress responses only in those exposed fishes with sensitivities to the electromagnetic spectrum. This behavioral impact is expected to be temporary and minor. Similar to regular vessel traffic, in-water electromagnetic fields would be continuously moving and cover only a small spatial area during use; thus, population-level impacts are unlikely.</li> <li>• <u>Physical Disturbance and Strike</u>: Impacts on fishes from vessel strikes, in-water device strikes, military expended material strikes, and seafloor device strikes are highly unlikely because most fishes are highly mobile and have sensory capabilities that enable the detection and avoidance of vessels, expended materials, or objects in the water column or on the seafloor. Exceptions include a few large, slow-moving species such as manta rays, ocean sunfish, and whale sharks that occur near the surface. Long-term consequences from vessel strikes for individuals and fish populations are not expected.</li> <li>• <u>Entanglement</u>: Fishes could be exposed to multiple entanglement stressors associated with Navy training and testing activities. The potential for impacts is dependent on the physical properties of the expended materials and the likelihood a fish would encounter a potential entanglement stressor and become entangled in it. Physical characteristics of wires and cables, and decelerators/parachutes, combined with the sparse distribution of these items throughout the Study Area, indicates a very low potential for fishes to encounter and become entangled in them. Population-level impacts are unlikely because of the low numbers of fishes potentially impacted by entanglement stressors.</li> <li>• <u>Ingestion</u>: The likelihood that expended items would cause a potential impact on a given fish species depends on the size and feeding habits of the fish, the rate at which the fish encounters the item, and the composition of the item. Military expended materials from munitions present an ingestion risk to fishes that forage in the water column and on the seafloor. Military expended materials other than munitions present an ingestion risk for fishes foraging at or near the surface while these materials are buoyant, and on the seafloor when the materials sink. Population-level impacts are unlikely because of the low numbers of fishes potentially impacted by ingestion stressors.</li> <li>• <u>Secondary</u>: Effects on sediment or water quality would be minor, temporary, and localized and could have short-term, small-scale secondary effects on fishes; however, there would be no persistent or large-scale effects on the growth, survival, distribution, or populations of fishes.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.9</b> Fishes (continued)</p>	<p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Although the number of training and testing activities under Alternative 2 would increase relative to Alternative 1, acoustic impacts are not expected to be meaningfully different from those described under Alternative 1. Therefore, impacts associated with training and testing activities are the same as Alternative 1.</li> <li>• <u>Explosives</u>: Although activities under Alternative 2 increase relative to Alternative 1, impacts from explosives are not expected to be meaningfully different from those described under Alternative 1. Therefore, impacts associated with training and testing activities are the same as Alternative 1.</li> <li>• <u>Energy</u>: Although activities under Alternative 2 increase relative to Alternative 1, impacts from energy stressors are not expected to be meaningfully different from those described under Alternative 1. Therefore, impacts associated with training and testing activities are the same as Alternative 1.</li> <li>• <u>Physical Disturbance and Strike</u>: Although impacts from physical disturbance and strike under Alternative 2 would increase slightly compared to those of Alternative 1 because of a small increase in proposed activities, physical disturbance and strike impacts on marine fishes under Alternative 2 would also be negligible.</li> <li>• <u>Entanglement</u>: Although activities under Alternative 2 increase relative to Alternative 1, impacts from entanglement stressors are not expected to be meaningfully different from those described under Alternative 1. Therefore, impacts associated with training and testing activities are the same as Alternative 1.</li> <li>• <u>Ingestion</u>: Although activities under Alternative 2 increase relative to Alternative 1, impacts from ingestion stressors are not expected to be meaningfully different from those described under Alternative 1. Therefore, impacts associated with training and testing activities are the same as Alternative 1.</li> <li>• <u>Secondary</u>: Impacts from secondary stressors under Alternative 2 would increase slightly compared to those of Alternative 1 due to a small increase in activities and expended materials; however, the difference would not result in substantive changes. Therefore, impacts from secondary stressors associated with training and testing activities are the same as Alternative 1.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.10</b> Terrestrial Species and Habitats</p>	<p>The Navy considered all stressors that could potentially impact terrestrial species and habitats as a result of the Proposed Action. The SEIS/OEIS addresses potential impacts on terrestrial species and habitats on FDM. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b>No Action Alternative:</b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, the proposed training and testing activities would not occur in the MITT Study Area. For FDM, the lease agreement between the U.S. government and the Commonwealth of the Northern Mariana Islands would remain in place, and the island would continue to be maintained as a Navy range.</li> </ul> <p><b>Alternative 1:</b></p> <ul style="list-style-type: none"> <li>• <b>Acoustics:</b> Navy training activities have the potential to expose terrestrial wildlife on FDM to multiple acoustic stressors. Sources of noise from weapons firing that may be heard by wildlife on FDM include close-in weapons firing from vessels, helicopters, close-combat surface firing from fixed-wing aircraft, and surface firing, with the largest increase in munitions use resulting from small arms, medium-caliber explosives, and mortar and grenade use during Direct Action training activities. These training events would occur within the Northern Special Use Area and fire into the impact areas towards the south; therefore, more megapodes and bats (along with other wildlife species) would be exposed to more weapons firing noise under Alternative 1 because of the increased number of small-caliber rounds, medium-caliber explosives, and grenades and mortars fired into impact areas from the Northern Special Use Area. The weapons-firing noise would likely be masked somewhat by natural sounds on FDM, such as waves and winds. The impulsive sound caused by weapon firings would have limited potential to mask important biological sound because the duration of the impulse is brief, even when multiple shots are fired in series.</li> <li>• <b>Explosives:</b> There would be a small increase in the number of explosions on FDM, which would increase the number of exposures to percussive force. The types of explosive munitions used on FDM include explosive bombs, missiles, rockets, explosive grenades and mortars, medium-caliber projectiles, and large-caliber projectiles. The number of explosive bombs would not change compared to the 2015 MITT Final EIS/OEIS, while the increases in NEW would be from the increased number of smaller NEW munitions. Although more ordnance would be used on FDM under Alternative 1, all of the ordnance would target impact zones, with the same avoidance and minimization measures in place as analyzed previously in 2015.</li> <li>• <b>Physical Disturbance and Strike:</b> Navy training activities have the potential to impact terrestrial species and habitats through direct strike, habitat disturbance, and potential wildfires ignited by training activities on FDM. Factors that limit the potential for additional adverse impacts from physical disturbance and strike, however, include maintaining the same ordnance type and targeting restrictions included in the 2015 MITT Final EIS/OEIS. All ordnance expended on FDM would</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.10</b> Terrestrial Species and Habitats (continued)</p>	<p>target existing impact zones, with the same ordnance restrictions imposed on FDM activities and with the same avoidance and minimization measures in place.</p> <ul style="list-style-type: none"> <li>• <u>Secondary</u>: The Navy analyzed the potential for invasive species introduction, establishment, and spread on FDM as part of the analysis for secondary stressors. Of the two training activity types that would increase on FDM under Alternative 1, only Direct Action training activities present potential introduction pathways for invasive species. Introduction pathways that originate on Guam and end on FDM present a potential hazard for brown treesnake dispersal. The Direct Action training activities, which are proposed to increase, would still be subject to biosecurity measures. The potential introduction of invasive species to FDM from additional transits during Direct Action training activities is unlikely; therefore, there would be no appreciable increase in risk.</li> </ul> <p><b>Alternative 2 (Preferred Alternative):</b></p> <ul style="list-style-type: none"> <li>• <u>Acoustics</u>: Potential impacts on terrestrial species and habitats would be similar to those discussed under Alternative 1. Under Alternative 2, there would be an increase in the amount of ordnance expended compared to Alternative 1. As with Alternative 1, these training events would occur within the Northern Special Use Area and fire into the impact areas towards the south; therefore, more megapodes and bats (along with other wildlife species) would be exposed to more weapons firing noise under Alternative 2 because of the increased number of small-caliber rounds, medium-caliber explosives, and grenades and mortars fired into impact areas from the Northern Special Use Area. The weapons-firing noise would likely be masked somewhat by natural sounds on FDM, such as waves and winds. Additionally, the impulsive sound caused by weapon firings would have limited potential to mask important biological sound because the duration of the impulse is brief, even when multiple shots are fired in series, and the short duration of an exercise expending munitions on FDM.</li> <li>• <u>Explosives</u>: Under Alternative 2, there would be an increase in the number of events using FDM as a training location or target, with a corresponding increase in the number of munitions items expended on FDM (see Table 3.6-2) compared to what was analyzed previously in the 2015 MITT Final EIS/OEIS and under Alternative 1. However, factors that limit the potential for additional adverse impacts would include maintaining the same ordnance type and targeting restrictions consistent with Alternative 1.</li> <li>• <u>Physical Disturbance and Strike</u>: Under Alternative 2, potential physical disturbance and strike impacts on terrestrial species and habitats would be similar to those discussed under Alternative 1. All ordnance expended on FDM would target existing impact zones, with the same ordnance restrictions imposed on FDM activities and with the same avoidance and minimization measures in place. Recent relocation of target positions from the cliff to inland portions within impact zones further reduces potential impacts on terrestrial species and wildlife on FDM.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.10</b> Terrestrial Species and Habitats (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Secondary</u>: Impacts from secondary stressors on terrestrial species and habitats on FDM resulting from Alternative 2 activities would be nearly identical to those from Alternative 1.</li> </ul>
<p><b>Section 3.11</b> Cultural Resources</p>	<p>The Navy considered all stressors that could potentially impact cultural resources as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, the proposed training and testing activities would not occur in the MITT Study Area. Discontinuing training and testing activities would result in fewer stressors that potentially affect cultural resources. Therefore, discontinuing training and testing activities would reduce the potential for stressor impacts on cultural resources.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: Explosive stressors resulting from underwater explosions creating shock waves and cratering of the seafloor would not result in adverse effects to known submerged cultural resources because of the great water depth in areas where most explosives would be used. In accordance with Section 402 of the NHPA, no known World Heritage Sites would be affected. Therefore, no submerged cultural resources are expected to be impacted.</li> <li>• <u>Physical Disturbance and Strike</u>: Physical disturbance and strike stressors resulting from in-water devices, military expended materials, and seafloor devices during training and testing activities would not result in adverse effects on known submerged cultural resources because of the deep water and the implementation of standard operating procedures. Devices are also designed so they do not come in contact with the sea floor. In accordance with Section 402 of the NHPA, no known World Heritage Sites would be affected. Therefore, no submerged cultural resources are expected to be affected.</li> <li>• Measures to avoid and protect submerged historic properties would continue to be implemented according to the mitigation measures and procedures identified and described in the 2009 MIRC Programmatic Agreement. While the MIRC Programmatic Agreement expired in December 2019, the Navy initiated an NHPA Section 106 consultation in January 2019 with an eye toward developing new updated Programmatic Agreements. The interim PAs took effect after the expiration of the 2009 MIRC PA and serve as a continuation of the DoD’s compliance under Section 106 of the NHPA for MITT activities. The interim PA with the CNMI Historic Preservation Officer (HPO) expires September 10, 2020, while the interim PA with the Guam HPO expires June 30, 2020.</li> </ul>



**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.11</b> Cultural Resources (continued)</p>	<p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <u>Explosives</u>: Explosive ordnance would continue to occur in the same areas and would have no appreciable change on the impact analysis or conclusions described under Alternative 1 and in the 2015 MITT Final EIS/OEIS. Therefore, potential effects would be the same as under Alternative 1.</li> <li>• <u>Physical Disturbance and Strike</u>: Under Alternative 2, increases as compared to Alternative 1 would have no appreciable change on the impact conclusions described under Alternative 1 and in the 2015 MITT Final EIS/OEIS. Therefore, potential effects would be the same as under Alternative 1.</li> </ul>
<p><b>Section 3.12</b> Socioeconomic Resources and Environmental Justice</p>	<p>The Navy considered all stressors that could potentially impact socioeconomic resources and environmental justice as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, the proposed training and testing activities would not occur in the MITT Study Area. Limits on accessibility to the ocean and airspace associated with the proposed training and testing activities would not be introduced. Therefore, existing environmental conditions would either remain unchanged or would improve slightly after cessation of ongoing training and testing activities.</li> <li>• Discontinuing training and testing activities would result in fewer stressors on socioeconomic resources within the marine environment where training and testing activities have historically occurred. Therefore, discontinuing training and testing activities would reduce the potential for impacts on socioeconomic resources, such as commercial and recreational fishing, commercial transportation and shipping, tourism, and traditional fishing practices in the Study Area.</li> <li>• The Navy and Navy personnel are an important and often stabilizing contributor to the local and regional economies. Therefore, not conducting the proposed at-sea training and testing activities may have negative impacts on the socioeconomic resources of Guam and the CNMI. The number and types of jobs available on Guam and to a lesser extent the CNMI may decline. For example, vessels and associated equipment used specifically for military readiness activities would no longer be needed if training and testing activities ceased. Consequently, the civilian and Navy personnel supporting those activities may be relocated or reassigned, or have to find other employment. The secondary effects from reducing the number of personnel who support at-sea military training and testing activities could include a decline in revenue for local businesses frequented by Navy personnel and their families, such as businesses in the food services, retail, and housing sectors.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.12</b> Socioeconomic Resources and Environmental Justice (continued)</p>	<p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Accessibility:</u></b> Alternative 1 may result in impacts on commercial and recreational fishing, traditional fishing practices, or tourism when areas of co-use are temporarily inaccessible during training and testing activities to ensure public safety. Some areas in the Study Area are permanently restricted and inaccessible by the public, notably the waters extending 3 NM from shore around FDM. These restrictions remain in place to ensure the safety of the public. No impacts on commercial transportation and shipping are anticipated because training and testing activities are scheduled and located to avoid potential conflicts with commercial vessels and air traffic. The military would continue to collaborate with local communities to enhance existing means of communication with the public to reduce the potential effects of limiting accessibility.</li> <li>• <b><u>Airborne Acoustics:</u></b> Under Alternative 1, potential impacts from airborne acoustics from proposed training and testing activities would remain consistent with ongoing activities and would not be significant.</li> <li>• <b><u>Physical Disturbance and Strike and Airborne Acoustic Disturbances:</u></b> Alternative 1 is not expected to result in impacts from physical disturbance and strike or airborne acoustic disturbances on commercial and recreational fishing, traditional fishing practices, other recreational activities or tourism because the vast majority of training and testing activities would occur in areas far from locations typically used by the public for fishing and recreation activities. Furthermore, the large size of the Study Area over which the proposed military training and testing activities would be distributed, and adherence to the Navy’s standard operating procedures, would further reduce the potential for impacts.</li> <li>• <b><u>Environmental Justice:</u></b> Traditional fishers in Guam and the CNMI would not be disproportionately impacted by limits on accessibility, airborne acoustic disturbances, or the possibility of physical disturbance and strike because traditional fishers typically use the same general areas as recreational fishers, specifically areas closer to shore and far from the majority of training and testing activities.</li> </ul> <p><b><u>Alternative 2 (Preferred Alternative):</u></b></p> <ul style="list-style-type: none"> <li>• <b><u>Accessibility:</u></b> Limits on accessibility to marine areas used by the public could increase under Alternative 2 due to an increase in some training and testing activities. However, this increase would be a slight change and would have no appreciable change on the potential for impacts over what is analyzed for Alternative 1.</li> <li>• <b><u>Airborne Acoustics:</u></b> Under Alternative 2, potential impacts from airborne acoustics from proposed training and testing activities would remain consistent with ongoing activities and would not be significant.</li> <li>• <b><u>Physical Disturbance and Strike:</u></b> Under Alternative 2, potential physical disturbance and strike impacts associated with training and testing activities would be similar to those as described under Alternative 1.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.12</b> Socioeconomic Resources and Environmental Justice (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Environmental Justice</u>: Under Alternative 2, environmental justice impacts associated with training and testing activities would be similar to those as described under Alternative 1.</li> </ul>
<p><b>Section 3.13</b> Public Health and Safety</p>	<p>The Navy considered all stressors that could potentially impact public health and safety as a result of the Proposed Action. The following conclusions have been reached for the No Action and Action Alternatives:</p> <p><b><u>No Action Alternative:</u></b></p> <ul style="list-style-type: none"> <li>• Under the No Action Alternative, the proposed training and testing activities would not occur in the MITT Study Area. Not conducting the proposed at-sea training and testing activities may reduce the potential for interactions between the Navy and civilians but would not measurably improve public health and safety.</li> </ul> <p><b><u>Alternative 1:</u></b></p> <ul style="list-style-type: none"> <li>• <u>Underwater Energy</u>: Sources of underwater energy include active sonar, underwater explosions, air guns, vessel movements, aircraft overflights, mine warfare devices, and unmanned underwater vehicles. Standard operating procedures are in place to ensure no overlap between military and non-military activities. Impacts on public health and safety under Alternative 1 would be unlikely because of the military’s implementation of safety procedures.</li> <li>• <u>In-Air Energy</u>: In-air energy stressors include sources of electromagnetic energy and lasers, such as radar, navigational aids, high-energy lasers, and electronic warfare systems. High-energy lasers would be used during testing activities that were not previously analyzed. Standard operating procedures would be in place to prevent personnel and non-participants from being exposed. Impacts on public health and safety under Alternative 1 would be unlikely because of the military’s implementation of safety procedures.</li> <li>• <u>Physical Interactions</u>: Military aircraft, vessels, targets, munitions, towed devices, seafloor devices, and other expended materials have the potential to encounter recreational, commercial, institutional, and governmental aircraft; vessels; and users such as swimmers, divers, and anglers. Standard operating procedures are in place to ensure no overlap between military and non-military activities. Impacts on public health and safety under Alternative 1 would be unlikely because of the military’s implementation of safety procedures.</li> </ul>

**Table ES.5-1: Summary of Environmental Impacts for the No Action Alternative, Alternative 1, and Alternative 2 (continued)**

Resource Category	Summary of Impacts
<p><b>Section 3.13</b> Public Health and Safety (continued)</p>	<ul style="list-style-type: none"> <li>• <u>Secondary Stressors</u>: Impacts on public health and safety would be unlikely because there would be no violation of any standards or guidelines structured to protect human health.</li> </ul> <p><b>Alternative 2 (Preferred Alternative):</b></p> <ul style="list-style-type: none"> <li>• <u>Underwater Energy</u>: The locations, number of events, and potential effects associated with underwater energy stressors would increase under Alternative 2 compared to Alternative 1. However, standard operating procedures for in-water energy sources would prevent impacts on public health and safety.</li> <li>• <u>In-Air Energy</u>: The locations, number of events, and potential effects associated with in-air energy stressors would increase under Alternative 2 compared to Alternative 1. However, standard operating procedures for in-air energy sources would prevent impacts on public health and safety.</li> <li>• <u>Physical Interactions</u>: Impacts on public health and safety under Alternative 2 would be unlikely, even with increased activity levels, because of the military’s implementation of standard operating procedures.</li> <li>• <u>Secondary Stressors</u>: Potential impacts from secondary stressors under Alternative 2 would be the same as Alternative 1.</li> </ul>

Notes: SEIS/OEIS = Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement, ESA = Endangered Species Act, FDM = Farallon de Medinilla, MBTA = Migratory Bird Treaty Act, MITT = Mariana Islands Training and Testing, MMPA = Marine Mammal Protection Act, Navy = United States Department of the Navy, U.S. = United States, USFWS = U.S. Fish and Wildlife Service, NMFS = National Marine Fisheries Service, MIRC = Mariana Islands Range Complex, CNMI = Commonwealth of the Northern Mariana Islands, NEW = Net Explosive Weight, ft. = feet, m = meter(s), NM = nautical miles, NM<sup>2</sup> = square nautical miles, NAAQS = National Ambient Air Quality Standards, NHPA = National Historic Preservation Act

### ES.5.1 Cumulative Impacts

All resources are analyzed in Chapter 4 (Cumulative Impacts); however, based on guidance from the CEQ (Council on Environmental Quality, 1997), the cumulative impacts analysis focuses on impacts that are “truly meaningful.” The level of analysis for each resource is commensurate with the intensity of the impacts identified in Chapter 3 (Affected Environment and Environmental Consequences) and the level to which impacts from the Proposed Action are expected to overlap with impacts from existing activities. Therefore, a full analysis of potential cumulative impacts is provided for marine mammals, marine invertebrates, sea turtles, and socioeconomic resources:

- Past human activities have impacted these resources to the extent that several marine mammals, sea turtles, marine invertebrate species, and some terrestrial species occurring in the Study Area are ESA-listed. Several marine mammal species have stocks that are classified as strategic stocks under the MMPA.
- The use of sonar and other non-impulsive sound sources under Alternative 1 and Alternative 2 has the potential to disturb or injure marine mammals and sea turtles.
- Explosive detonations, and vessel strikes under Alternative 1 and Alternative 2 have the potential to disturb, injure, or kill marine mammals and sea turtles.
- Under Alternative 1 and Alternative 2, danger zones would restrict access to fishing and recreational areas when ranges are in use.

The aggregate impacts of past, present, and other reasonably foreseeable future actions would continue to have significant impacts on some individual marine mammals and all sea turtle species in the Study Area. Alternative 1 or Alternative 2 would contribute to cumulative impacts; however, marine mammal and sea turtle mortality and injury from non-Navy actions associated with commercial fisheries, commercial vessel strikes, and entanglement in marine debris are the leading causes of direct mortality to marine mammals and sea turtles (Carretta et al., 2017; Helker et al., 2017; Lent & Squires, 2017; National Marine Fisheries Service, 2016; National Oceanic and Atmospheric Administration Marine Debris Program, 2014; Read et al., 2006). In summary, based on the analysis presented in Sections 3.4 (Marine Mammals), 3.5 (Sea Turtles), 3.8 (Marine Invertebrates), and 3.12 (Socioeconomic Resources), the current aggregate impacts of past, present, and other reasonably foreseeable future actions are not significantly different than the assessment in the 2015 MITT Final EIS/OEIS. For marine mammals, sea turtles, and marine invertebrates, Alternative 1 or Alternative 2 would contribute to and increase cumulative impacts, but the relative contribution would be negligible compared to other non-Navy actions. Cumulative effects on socioeconomic resources may have short-term impacts on accessibility to public services, fishing sites, and tourism, but they are not expected to have long-term negative impacts on these resources or the economy of Guam and the CNMI. No new information or circumstances are significant enough to warrant further cumulative impact review.

The analysis presented in Chapter 3 (Affected Environment and Environmental Consequences) and Chapter 4 (Cumulative Impacts) indicates the incremental contribution of Alternative 1 or Alternative 2 to cumulative impacts on sediments and water quality, air quality, marine habitats, marine birds, marine vegetation, fishes, cultural resources, and public health and safety would occur but be negligible.

### ES.6 Standard Operating Procedures, Mitigation, and Monitoring

Within the Study Area, the Navy implements standard operating procedures, mitigation measures, and marine species monitoring and reporting. Marine species monitoring and reporting efforts are designed

to track compliance with take authorizations, evaluate the effectiveness of mitigation measures, and improve understanding of the effects of training and testing activities on marine resources.

#### **ES.6.1 Standard Operating Procedures**

For training and testing to be effective, units must be able to safely use their sensors and weapons systems optimally as they are intended to be used in military missions and combat operations and to their optimum capabilities. Standard operating procedures applicable to training and testing have been developed through years of experience. The primary purpose of these procedures is to provide for safety (including public health and safety) and mission success and therefore are included as part of the Proposed Action and considered in the Chapter 3 (Affected Environment and Environmental Consequences) environmental analysis for applicable resources. As described in Section 2.3.3 (Standard Operating Procedures), there are benefits to environmental and cultural resources resulting from the Navy's implementation of standard operating procedures.

#### **ES.6.2 Mitigation**

Mitigation measures differ from standard operating procedures. Mitigation is designed specifically for the purpose of avoiding or reducing potential impacts from the Proposed Action on environmental and cultural resources, whereas standard operating procedures are designed to provide for safety and mission success. Mitigation measures that the Navy would implement under the Proposed Action are organized into three categories: procedural mitigation measures for at-sea activities, at-sea mitigation areas, and terrestrial mitigation measures for activities on FDM. Procedural mitigation is mitigation that would be implemented whenever and wherever an applicable training or testing activity takes place within the Study Area. Mitigation areas are geographic locations within the Study Area where the military would implement additional mitigation during all or part of the year. Terrestrial mitigation measures are measures that the Navy would implement during applicable training and testing activities on land at FDM.

The Navy coordinated with the appropriate regulators (e.g., NMFS) on the mitigation measures detailed in Chapter 5 (Mitigation) and Appendix I (Geographic Mitigation Assessment) through the consultation and permitting processes. The Navy Record of Decision, MMPA Regulations and Letter of Authorization, ESA Biological Opinion, and other applicable consultation documents would document all mitigation measures the Navy would implement under the Proposed Action.

#### **ES.6.3 Mitigation Measures Considered but Eliminated**

A number of possible additional mitigation measures were suggested during the public scoping period and Draft SEIS/OEIS public comment period, as well as during comment periods of previous Navy environmental documents. Section 5.6 (Measures Considered but Eliminated) and Appendix I (Geographic Mitigation Assessment) contain information on measures that did not meet the appropriate balance between being effective and practical to implement and therefore would not be implemented under the Proposed Action.

#### **ES.6.4 Monitoring and Reporting**

The Navy is committed to demonstrating environmental stewardship while executing its national security mission, complying with the suite of applicable federal environmental laws and regulations, and providing required and relevant reports to appropriate regulatory agencies. Since 2006, across all Navy range complexes (Mariana Islands, Pacific, Atlantic, Gulf of Mexico, and Gulf of Alaska), the Navy has produced Major Exercise Reports, Annual Exercise Reports, and Monitoring Reports and submitted to

NMFS to further research goals aimed at understanding the Navy's impact on the environment as it trains and conducts tests to accomplish its mission. As a complement to the Navy's commitment to avoiding and reducing impacts of the Proposed Action through mitigation, the Navy will undertake monitoring efforts to track compliance with take authorizations, help investigate the effectiveness of implemented mitigation measures, and better understand the impacts of the Proposed Action on marine resources. Taken together, mitigation and monitoring comprise the Navy's integrated approach for reducing environmental impacts from the Proposed Action. The Navy's overall monitoring approach will seek to leverage and build on existing research efforts whenever possible.

Consistent with the cooperating agency agreement with NMFS, mitigation and monitoring measures presented in the SEIS/OEIS focus on the requirements for protection and management of marine resources. Since monitoring will be required for compliance with the Final Rule issued for the Proposed Action under the MMPA, details of the monitoring program are being developed in coordination with NMFS through the regulatory process.

The Navy developed the Integrated Comprehensive Monitoring Program to serve as the overarching framework for coordinating its marine species monitoring efforts and as a planning tool to focus its monitoring priorities pursuant to ESA and MMPA requirements (U.S. Department of the Navy, 2010). The purpose of the Integrated Comprehensive Monitoring Program is to coordinate monitoring efforts across all regions and to allocate the most appropriate level and type of monitoring effort for each range complex based on a set of standardized objectives, regional expertise, and resource availability. Additional information about the U.S. Navy Marine Species Monitoring Program, including an introduction to adaptive management and strategic planning, is provided in Section 5.1.2.2.1 (Marine Species Research and Monitoring Programs).

The Navy is committed to documenting and reporting relevant aspects of training and testing activities to reduce environmental impacts and improve future environmental assessments. Initiatives include training and testing activity reporting and incident reporting. Additional information is available on the U.S. Navy Marine Species Monitoring Program website [www.navy.marinespeciesmonitoring.us](http://www.navy.marinespeciesmonitoring.us).

## **ES.7 Other Considerations**

### **ES.7.1.1 Consistency with Other Federal, Guam, CNMI, and Local Plans, Policies, and Regulations**

Based on an evaluation of consistency with statutory obligations, the proposed training and testing activities would not conflict with the objectives or requirements of federal, territorial, regional, or local plans, policies, or legal requirements. The Navy consulted with regulatory agencies as appropriate during the NEPA process and would continue to coordinate as necessary prior to implementation of the Proposed Action to ensure all legal requirements are met.

### **ES.7.1.2 Relationship Between Short-Term Use of the Human Environment and Maintenance and Enhancement of Long-Term Productivity**

In accordance with NEPA, the SEIS/OEIS provides an analysis of the relationship between a project's short-term impacts on the environment and the effects these impacts may have on the maintenance and enhancement of the long-term productivity of the affected environment. The Proposed Action may result in both short- and long-term environmental effects; however, it would not be expected to result in impacts that would reduce environmental productivity, permanently narrow the range of beneficial uses of the environment, or pose long-term risks to health, safety, or the general welfare of the public.

### **ES.7.1.3 Irreversible or Irretrievable Commitment of Resources**

For both Alternative 1 and Alternative 2, most resource commitments are neither irreversible nor irretrievable. Most impacts are short-term and temporary or, if long lasting, are negligible. No habitat associated with threatened or endangered species would be lost as result of implementation of the Proposed Action. There would be no building or facility construction; therefore, the consumption of materials typically associated with such construction (e.g., concrete, metal, sand, or fuel) would not occur. Energy typically associated with construction activities would not be expended and irreversibly lost.

Implementation of the Proposed Action would require fuels used by aircraft, ships, and ground-based vehicles. Relative total fuel use could increase because fixed- and rotary-wing flight and ship activities could increase. Therefore, if total fuel consumption increased, this nonrenewable resource would be considered irretrievably lost.

### **ES.7.1.4 Energy Requirements and Conservation Potential of Alternatives**

Resources that would be permanently and be continually consumed by implementation of the Proposed Action include water, electricity, natural gas, and fossil fuels; however, the amount and rate of consumption of these resources would not result in significant environmental impacts or the unnecessary, inefficient, or wasteful use of resources.

Sustainable range management practices are in place that protect and conserve natural and cultural resources and preserve access to training and testing areas for current and future requirements while addressing potential encroachments that threaten to impact range and training area capabilities.

## **ES.8 Public Involvement**

The first step in the NEPA process for an EIS is to prepare a Notice of Intent to develop an EIS. The Navy published a Notice of Intent for the SEIS/OEIS in the *Federal Register* and several newspapers on August 1, 2017. In addition, the public notices were distributed to federal, state, and local elected officials and government agencies. The Notice of Intent provided an overview of the Proposed Action and the scope of the SEIS/OEIS, and initiated the scoping process.

### **ES.8.1 Scoping Process**

In accordance with CEQ regulations for implementing the requirements of NEPA, scoping is not required for a supplement to a draft or final EIS (40 CFR 1502.9(c)(4)); however, in an effort to maximize public participation and ensure the public's input was considered, the Navy chose to conduct scoping for the SEIS/OEIS.

Public scoping comments were accepted during the 45-day scoping period from August 1, 2017 to September 15, 2017. In total, the Navy received 36 comment submissions from individuals, groups, agencies, and elected officials. The Navy considered all scoping comments in preparing the SEIS/OEIS.

### **ES.8.2 Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement Public Comments**

The Draft SEIS/OEIS was released for public review and comment February 1, 2019 through April 17, 2019. The Navy made the following efforts to facilitate maximum public participation during the Draft SEIS/OEIS public review and comment period:

- Sent notification letters to federal and local elected officials and agencies.



- Mailed postcards to 350 recipients on the project mailing list, including individuals; non-governmental organizations; community and business groups; fishing, aviation, and recreation groups; and private companies.
- Distributed news releases to announce the availability of the Draft SEIS/OEIS and public meetings.
- Participated in numerous press and media engagements to broadcast availability of the Draft SEIS/OEIS and public meetings.
- Placed newspaper advertisements to announce the availability of the Draft SEIS/OEIS and public meetings in local and regional newspapers.
- Held three public meetings in the CNMI (Tinian, Rota, and Saipan) and one in Guam.

Changes in this Final SEIS/OEIS reflect comments made on the Draft SEIS/OEIS during the public comment period. Appendix K (Public Comment Responses) describes the public's participation and includes a list of the agencies and private entities that commented on the Draft SEIS/OEIS, along with a comment matrix with Navy responses associated with the comments received.

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