2 Description of Proposed Action and Alternatives

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Northwest Training and Testing

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2 Description of Proposed Action and Alternatives

The United States (U.S.) Department of the Navy (Navy) proposes to conduct military readiness activities, which include training (referred to as "training"), and research, development, testing, and evaluation (referred to as "testing") activities in the Northwest Training and Testing (NWTT) Study Area. This Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) (Supplemental) is being prepared to assess the potential environmental impacts associated with proposed training and testing activities to be conducted within the NWTT Study Area. These proposed activities are generally consistent with those analyzed in the October 2015 *Final Northwest Training and Testing Environmental Impact Statement/Overseas Environmental Impact Statement* (U.S. Department of the Navy, 2015), hereinafter referred to as the 2015 NWTT Final EIS/OEIS, and are representative of activities the Navy has been conducting in the Study Area for decades.

This chapter describes the Study Area and identifies the primary mission areas for which training and testing activities are conducted. This builds upon the purpose and need to train as described in Chapter 1 (Purpose and Need). Each warfare community (e.g., aviation, surface, submarine, and expeditionary) conducts training and testing activities that contribute to their success in a primary mission area. Each primary mission area requires unique skills, sensors, weapons, and technologies to accomplish the mission. For example, under the anti-submarine warfare primary mission area, surface, submarine, and aviation warfare communities each utilize different skills, sensors, and weapons to locate, track, and eliminate submarine threats. The testing community contributes to the success of anti-submarine warfare by anticipating and identifying technologies and systems that respond to the needs of the warfare communities. See the 2015 NWTT Final EIS/OEIS, Section 2.3 (Descriptions of Sonar, Ordnance/Munitions, Targets and Other Systems Employed in Northwest Training and Testing Activities) for complete descriptions.

This chapter describes the activities that comprise the Proposed Action for this Supplemental that are necessary to meet training and testing requirements beyond 2020 and into the reasonably foreseeable future. These activities are then analyzed for their potential effects on the quality of the human environment in the resource-specific chapters of this Supplemental. This level of training and testing is based upon decades of experience and lessons learned from conducting combat operations in a variety of environments. In the Navy's professional judgment, the type and level of activities analyzed in this Supplemental are required to meet the missions to which Congress has required the Navy to be ready to execute. For further details regarding specific training and testing activities, please see Appendix A (Navy Activities Descriptions). The Navy intends to request from the National Marine Fisheries Service (NMFS) an incidental take authorization under the Marine Mammal Protection Act (MMPA), and an incidental take statement under the Endangered Species Act (ESA) from both NMFS and the U.S. Fish and Wildlife Service for marine species (see Chapter 3, Affected Environment and Environmental Consequences). Relative to compliance with the National Environmental Policy Act, NMFS' Proposed Action will be a direct outcome of responding to the Navy's request for an incidental take authorization pursuant to the MMPA.

2.1 Description of the Northwest Training and Testing Study Area

The NWTT Study Area (Figure 2.1-1) for this Supplemental is the same as analyzed in the 2015 NWTT Final EIS/OEIS (Section 2.1, Description of the Northwest Training and Testing Study Area). Military activities in the Study Area occur (1) on the ocean surface, (2) beneath the ocean surface, and (3) in the air.

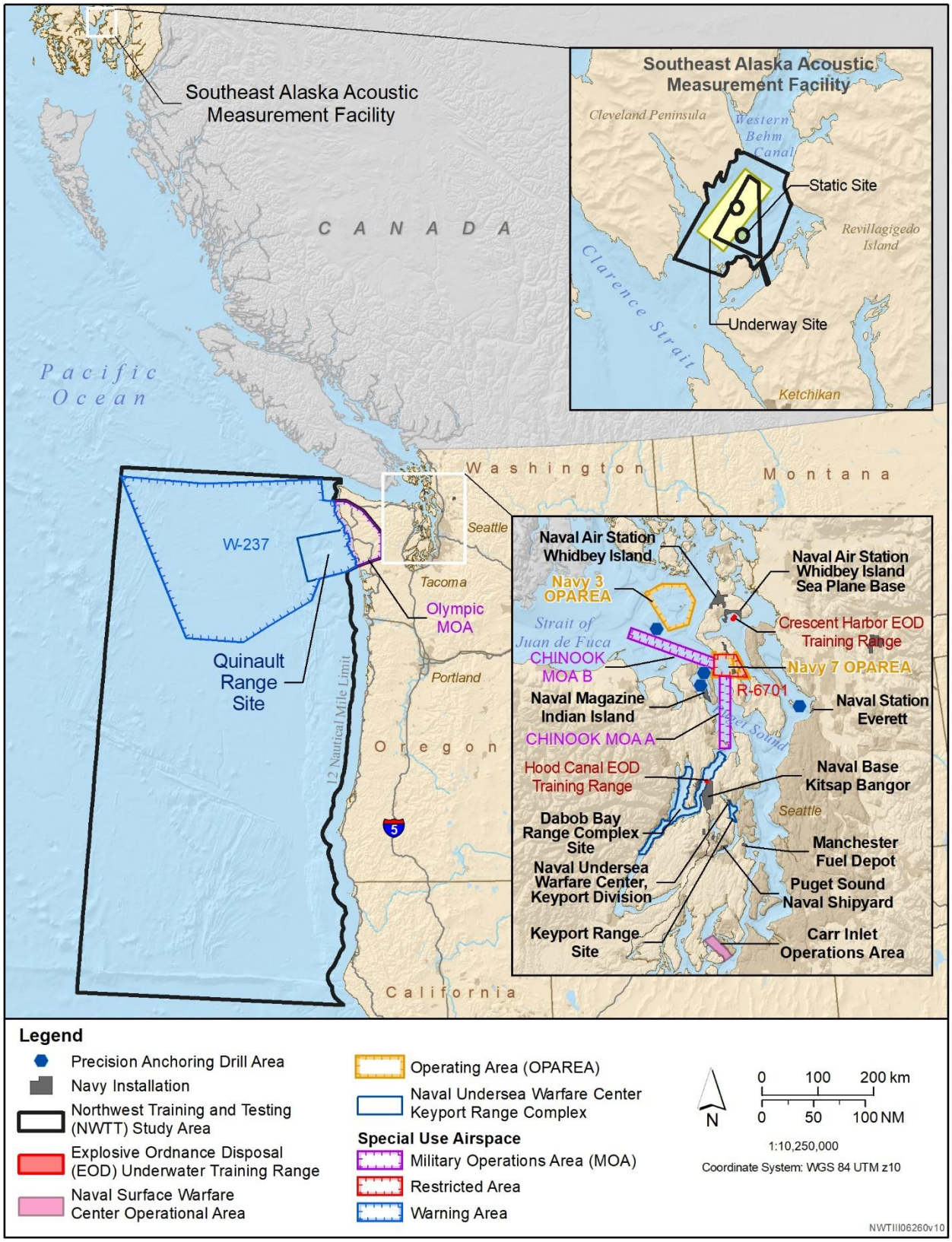

Figure 2.1-1: Northwest Training and Testing Study Area

To aid in the description of the ranges covered in this Supplemental, the Study Area is divided into three distinct geographic and functional subdivisions. See the 2015 NWTT Final EIS/OEIS, Section 2.1 (Description of the Northwest Training and Testing Study Area) for a complete description of the Study Area. Not all activities occur throughout the Study Area; most are limited to one or two of the three range subdivisions. All of the training and testing activities proposed in this Supplemental would occur in one or more of these three range subdivisions:

- The Offshore Area (Figure 2.1-2 and the 2015 NWTT Final EIS/OEIS, Section 2.1.1 – Description of the Offshore Area)
- The Inland Waters (Figure 2.1-3 and the 2015 NWTT Final EIS/OEIS, Section 2.1.2 – Description of the Inland Waters, with one correction; the total area of Restricted Area 6701 is 22 square nautical miles, not 56 square nautical miles as described in the 2015 NWTT Final EIS/OEIS)
- Western Behm Canal, Alaska (Figure 2.1-4 and the 2015 NWTT Final EIS/OEIS, Section 2.1.3 – Description of the Western Behm Canal, Alaska)

Since the 2015 NWTT Final EIS/OIES, the Federal Aviation Administration (FAA) approved the realignment of Offshore Area Special Use Airspace and subsequently charted it on May 24, 2019. W-237A and W-237B were combined and renamed W-237A (W-237B airspace no longer exists). Furthermore, Olympic Military Operations Area (MOA) A and MOA B are now combined and renamed the Olympic MOA. The FAA made this administrative change for purposes of airspace management and air traffic control to enhance the efficient use of airspace.

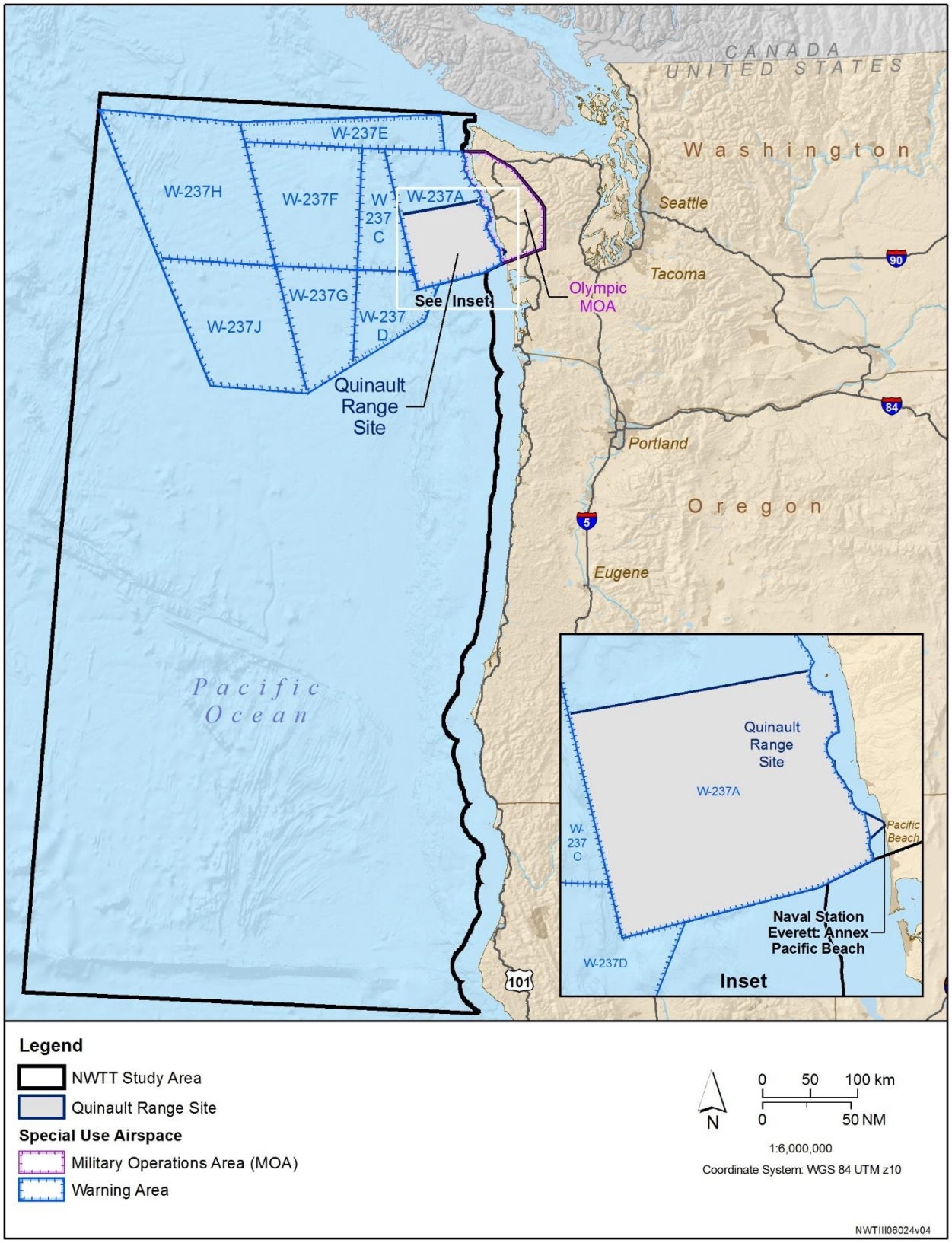

Figure 2.1-2: Offshore Area of the Northwest Training and Testing Study Area

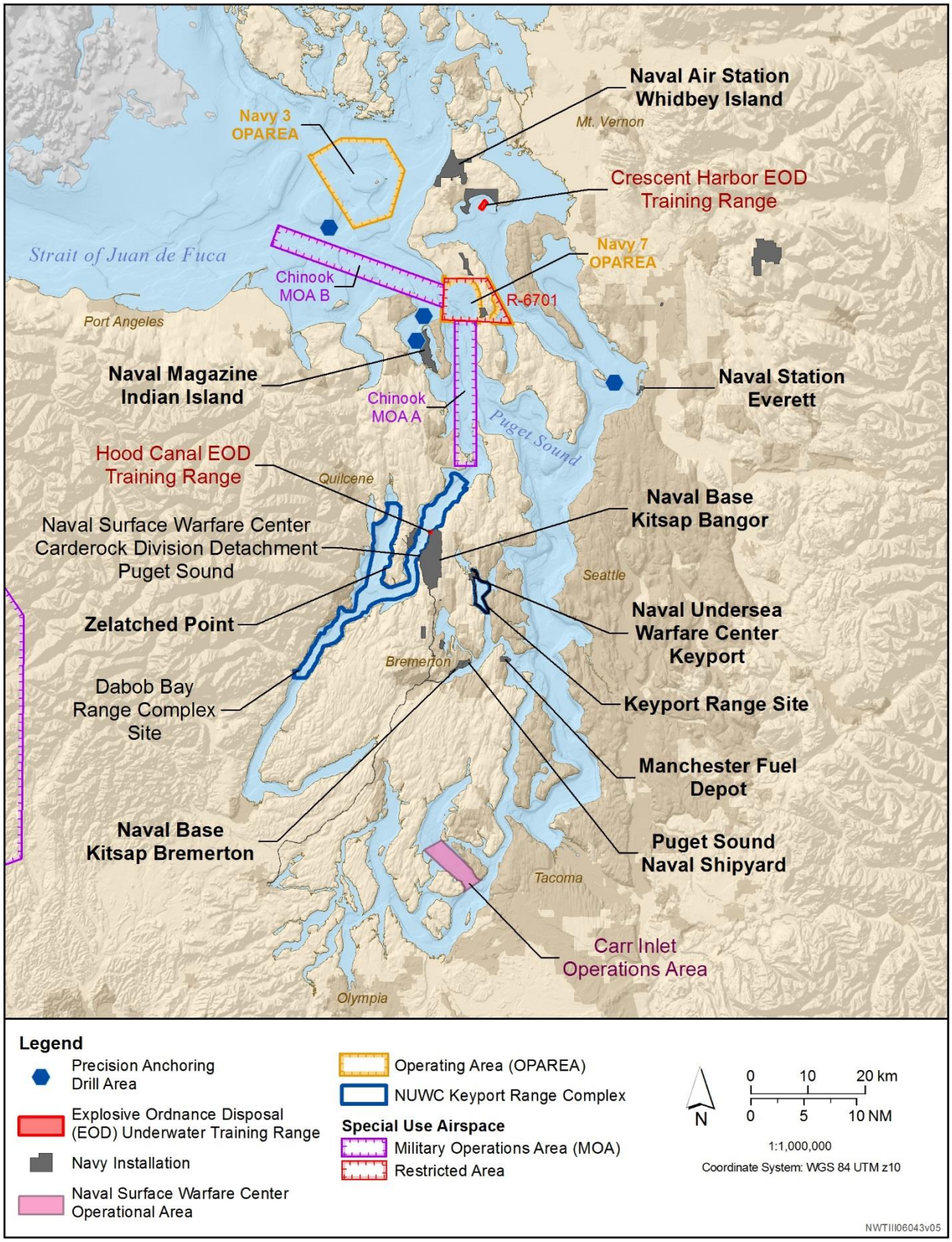

Figure 2.1-3: Range Complexes and Facilities in the Inland Waters of the Northwest Training and Testing Study Area

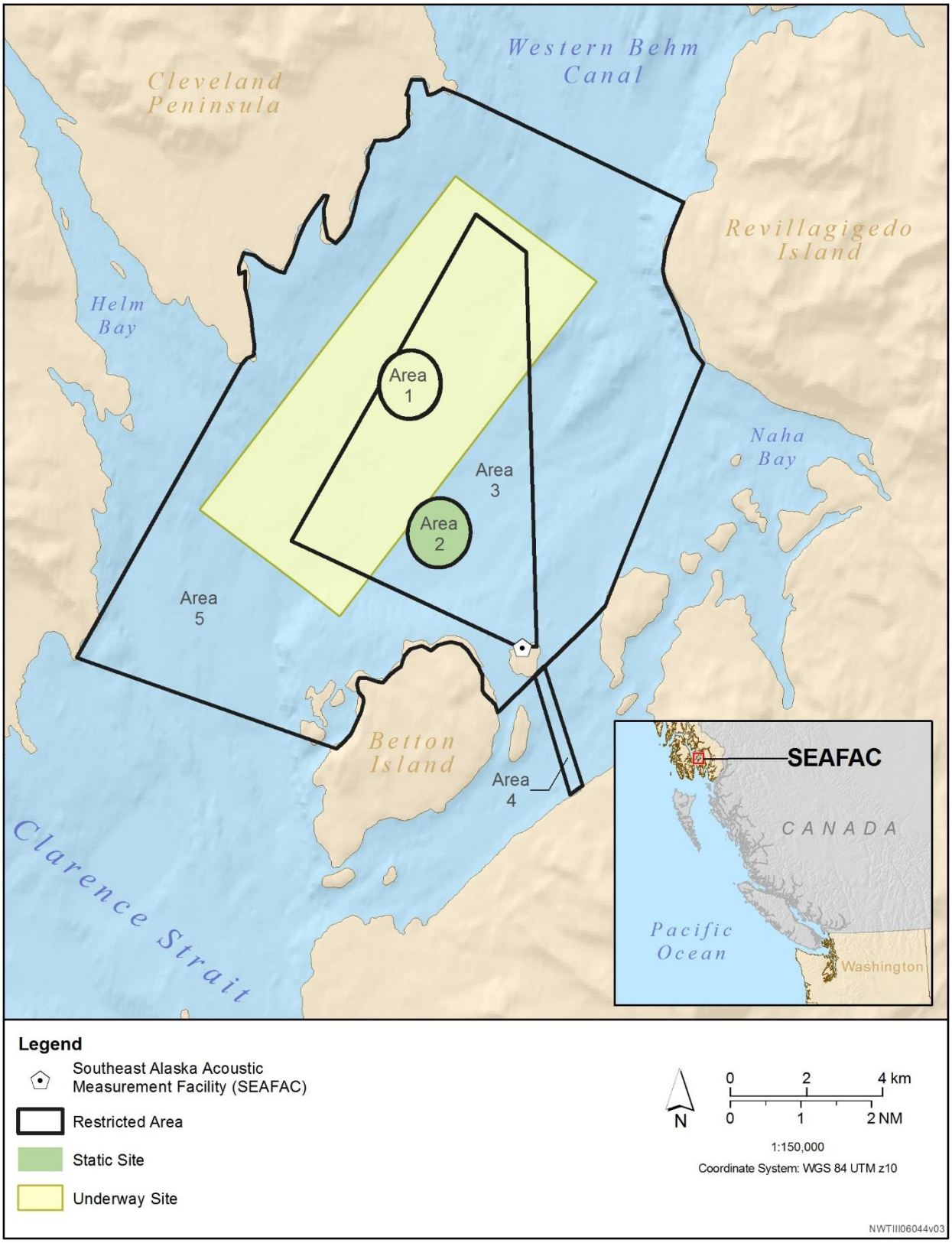

Figure 2.1-4: Western Behm Canal, Alaska and the Southeast Alaska Acoustic Measurement Facility

2.2 Primary Mission Areas

The Navy categorizes many of its training and testing activities into functional warfare areas called primary mission areas. The Navy's proposed activities for NWTT generally fall into the following five primary mission areas:

- air warfare
- anti-submarine warfare
- electronic warfare
- mine warfare
- surface warfare

The potential environmental impacts of water-based naval special operations training activities conducted at the unit level within offshore (coastal) and inland waters were evaluated in the 2015 NWTT Final EIS/OEIS, and Record of Decision signed on October 31, 2016. The 2015 NWTT Final EIS/OEIS included water-based training activities that did not have a land-based component. Additionally, NWTT only provided environmental coverage for Naval Special Warfare "Personnel Insertion/Extraction-Submersible" at five locations and it did not include activities inside the 3 nautical miles (NM) limit from Westport, Washington to the Columbia River. The 2010 Northwest Training Range Complex (NWTRC) EIS/OEIS, and Record of Decision signed on October 10, 2010, evaluated "NSW (Naval Special Warfare) Training" within the Inland Waters from Port Townsend marina to Naval Magazine Indian Island. This training was twice a year for up to three weeks. It included land-based activities (over the beach and special reconnaissance) and limited water-based activities (launch and recovery from Port Townsend, Insertion and Extraction and Diver/Swimmer). The NWTT and the NWTRC EIS/OEISs do not analyze the full range of activities, locations, and duration needed, or provide the diversity required of naval special operations personnel. A separate analysis, the Environmental Assessment for Naval Special Operations in Western Washington State, will supersede the same Naval Special Warfare activities ("Personnel Insertion/Extraction-Submersible" and "NSW Training") identified in the 2015 NWTT Final EIS/OEIS and NWTRC EIS/OEIS, respectively. A separate document better captures the land and cold water naval special warfare activities, some of which are not within the NWTT Study Area, but must be assessed as a whole. This Naval Special Operations Training Environmental Assessment was completed in 2019 (U.S. Department of the Navy, 2019).

Most activities addressed in this Supplemental are categorized under one of these primary mission areas; activities that do not fall within one of these areas are listed as "other activities." Each warfare community (aviation, surface, and subsurface) may train in some or all of these primary mission areas. The research and acquisition community also categorizes most, but not all, of its testing activities under these primary mission areas. A description of the sonar, munitions, targets, systems and other material used during training and testing activities within these primary mission areas is provided in Appendix A (Navy Activities Descriptions).

2.2.1 Air Warfare

The mission of air warfare (named anti-air warfare in the 2015 NWTT Final EIS/OEIS, Section 2.2.1, Anti-Air Warfare, but since changed by the Navy to "Air Warfare") is to destroy or reduce enemy air and missile threats (including unmanned airborne threats) and serves two purposes: to protect U.S. forces from attacks from the air and to gain air superiority. Air warfare provides U.S. forces with adequate attack warnings, while denying hostile forces the ability to gather intelligence about U.S. forces.

Aircraft conduct air warfare through radar search, detection, identification, and engagement of airborne threats. Surface ships conduct air warfare through an array of modern anti-aircraft weapon systems such as aircraft detecting radar, naval guns linked to radar-directed fire-control systems, surface-to-air missile systems, and radar-controlled guns for close-in point defense.

2.2.2 Anti-Submarine Warfare

The mission of anti-submarine warfare (see the 2015 NWTT Final EIS/OEIS, Section 2.2.3, Anti-Submarine Warfare) is to locate, neutralize, and defeat hostile submarine forces that threaten Navy surface forces. Anti-submarine warfare is based on the principle that surveillance and attack aircraft, ships, and submarines all search for hostile submarines. These forces operate together or independently to gain early warning and detection, and to localize, track, target, and attack submarine threats.

Anti-submarine warfare training addresses basic skills such as detection and classification of submarines, as well as evaluating sounds to distinguish between enemy submarines and friendly submarines, ships, and marine life. For a discussion on differentiating sound and noise, see Appendix D, Section D.1.2 (Signal Versus Noise). More advanced training integrates the full spectrum of anti-submarine warfare from detecting and tracking a submarine to attacking a target using either exercise torpedoes (i.e., torpedoes that do not contain a warhead) or simulated weapons. These integrated anti-submarine warfare training exercises are conducted in coordinated, at-sea training events involving submarines, ships, and aircraft.

Testing of anti-submarine warfare systems is conducted to develop new technologies and assess weapon performance and operability with new systems and platforms, such as unmanned systems. Testing uses ships, submarines, and aircraft to demonstrate capabilities of torpedoes, missiles, countermeasure systems, and underwater surveillance and communications systems. Tests may be conducted as part of a large-scale Fleet training event involving submarines, ships, fixed-wing aircraft, and helicopters. These integrated training events offer opportunities to conduct research and acquisition activities and to train aircrew in the use of new or newly enhanced systems during a large-scale, complex exercise.

2.2.3 Electronic Warfare

The mission of electronic warfare (see the 2015 NWTT Final EIS/OEIS, Section 2.2.4, Electronic Warfare) is to degrade the enemy's ability to use electronic systems, such as communication systems and radar, and to confuse or deny them the ability to defend their forces and assets. Electronic warfare is also used to detect enemy threats and counter their attempts to degrade the electronic capabilities of the Navy.

Typical electronic warfare activities include threat avoidance training, signals analysis for intelligence purposes, and use of airborne and surface electronic jamming devices (that block or interfere with other devices) to defeat tracking, navigation, and communications systems.

Testing of electronic warfare systems is conducted to improve the capabilities of systems and ensure compatibility with new systems. Testing involves the use of aircraft, surface ships, and submarine crews to evaluate the effectiveness of electronic systems. Similar to training activities, typical electronic warfare testing activities include the use of airborne and surface electronic jamming devices (see Appendix A, Navy Activities Descriptions, for a description of these devices) to defeat tracking and communications systems.

2.2.4 Mine Warfare

The mission of mine warfare (see the 2015 NWTT Final EIS/OEIS, Section 2.2.5, Mine Warfare) is to detect, classify, and avoid or neutralize (disable) mines to protect Navy ships and submarines and to maintain free access to ports and shipping lanes. Mine warfare also includes offensive mine laying to gain control of or deny the enemy access to sea space. Naval mines can be laid by ships, submarines, Navy divers, or aircraft.

Mine warfare neutralization training includes exercises in which ships, aircraft, submarines, underwater vehicles, unmanned vehicles, or marine mammal detection systems search for mine shapes. Personnel train to destroy or disable mines by attaching underwater explosives to or near the mine or using remotely operated vehicles to destroy the mine.

Testing and development of mine warfare systems is conducted to improve sonar, laser, and magnetic detectors intended to locate and record the positions of mines for avoidance or subsequent neutralization. Mine warfare testing and development falls into two primary categories: mine detection and classification, and mine countermeasure and neutralization. Mine detection and classification testing involves the use of air, surface, and subsurface vessels and uses sonar, including towed and side-scan sonar, and unmanned vehicles to locate and identify objects underwater. Mine detection and classification systems are sometimes used in conjunction with a mine neutralization system. Mine countermeasure and neutralization testing includes the use of air, surface, and subsurface units to evaluate the effectiveness of tracking devices, and countermeasure and neutralization systems to neutralize mine threats. Most neutralization tests use mine shapes, or non-explosive practice mines, to evaluate a new or enhanced capability.

A small percentage of mine warfare tests require the use of high-explosive mines to evaluate and confirm the ability of the system to neutralize a high-explosive mine under operational conditions. The majority of mine warfare systems are deployed by ships, helicopters, and unmanned vehicles. Tests may also be conducted in support of scientific research to support these new technologies.

2.2.5 Surface Warfare

The mission of surface warfare (named anti-surface warfare in the 2015 NWTT Final EIS/OEIS, Section 2.2.2, Anti-Surface Warfare, but since changed by the Navy to “Surface Warfare”) is to obtain control of sea space from which naval forces may operate, and entails offensive action against other surface, subsurface, and air targets while also defending against enemy forces. In surface warfare, aircraft use guns, air-launched cruise missiles, or other precision-guided munitions; ships employ torpedoes, naval guns, and surface-to-surface missiles; and submarines attack surface ships using torpedoes or submarine-launched, anti-ship cruise missiles.

Surface warfare training includes surface-to-surface gunnery and missile exercises, air-to-surface gunnery and missile exercises, and submarine missile or torpedo launch events, and other munitions against surface targets.

Testing of weapons used in surface warfare is conducted to develop new technologies and to assess weapon performance and operability with new systems and platforms, such as unmanned systems. Tests include various air-to-surface guns and missiles, surface-to-surface guns and missiles, and bombing tests. Testing events may be integrated into training activities to test aircraft or aircraft systems in the delivery of munitions on a surface target. In most cases the tested systems are used in the same manner in which they are used for Fleet training activities.

2.2.6 Other Activities

Other training and testing (see the 2015 NWTT Final EIS/OEIS, Section 2.2.7, Other Training Activities) is conducted in the Study Area that falls outside of the primary mission areas, but supports overall readiness. These include Maritime Security Operations events, including maritime security escorts for Navy vessels such as Fleet Ballistic Missile Submarines; Visit, Board, Search, and Seizure training; Maritime Interdiction Operations training; Force Protection training; Anti-Piracy Operations training; Acoustic Component Testing; Cold Water Support; and Hydrodynamic and maneuverability Testing.

Anti-terrorism/Force-protection training will occur as small boat attacks against moored ships at one of the Navy's piers inside Puget Sound. Operator training is also necessary for the maintenance of ship and submarine sonar at piers and at-sea.

2.3 Proposed Activities

The Navy has conducted training and testing activities in the Study Area for decades, with some types of activities dating back to at least the early 1900s. The tempo and types of training and testing activities have fluctuated because of the introduction of new technologies, the evolving nature of international events, advances in warfighting doctrine and procedures, and changes in force structure (organization and basing of ships, submarines, aircraft, and Sailors). Such developments influence the frequency, type, duration, intensity, and location of required training and testing activities. Because of the nature of training and testing requirements for forces that must be ready to deploy at all times, certain activities could occur throughout the year. Many of these activities are driven by world events with operational requirements arising from resulting national security considerations. Details on seasonality and day/night requirements of activities are included in Appendix A. The activities analyzed in this Supplemental are largely a continuation of activities that have been ongoing and were analyzed previously in the 2015 NWTT Final EIS/OEIS. This Supplemental includes the analysis of those at-sea activities projected to meet readiness requirements beyond 2020 and into the reasonably foreseeable future, includes 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.

2.3.1 Proposed Training Activities

Training activities proposed by the Navy in this Supplemental are described in Table 2.3-1. This table lists the current name of the activity, a brief description of the activity (see Appendix A, Navy Activities Descriptions, for a full description of each), and the activity name from the 2015 NWTT Final EIS/OEIS that corresponds to the current activity. Table 2.5-1 (at the end of this chapter) provides additional information on all training activities, such as location, number of events per year (comparing number of events proposed with the 2015 NWTT Final EIS/OEIS), and ordnance used, if any. More information about each activity can be found in Appendix A (Navy Activities Descriptions) and Appendix B (Activity Stressor Matrices).

2.3.2 Proposed Testing Activities

As described in the 2015 NWTT Final EIS/OEIS, the Navy's research and acquisition community engages in a broad spectrum of testing activities in support of the Fleet. The individual commands within the research and acquisition community included in this Supplemental are the Naval Sea Systems Command and the Naval Air Systems Command.

Testing activities proposed by the Navy in this Supplemental are described in Table 2.3-2 and Table 2.3-3. These tables list the current name of the activity, a brief description of the activity (see Appendix A, Navy Activities Descriptions, for a full description of each), and the activity name from the 2015 NWTT Final EIS/OEIS that corresponds to the current activity. Table 2.5-2 and Table 2.5-3 (at the end of this chapter) provide additional information on all testing activities, such as location, number of events per year, and ordnance used, if any. More information about each activity can be found in Appendix A (Navy Activities Descriptions) and Appendix B (Activity Stressor Matrices).

Table 2.3-1: Training Activities Descriptions

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Air Warfare		
Air Combat Maneuver	Fixed-wing aircrews aggressively maneuver against threat or simulated threat aircraft to gain tactical advantage.	Air Combat Maneuver
Gunnery Exercise (Surface-to-Air)	Surface ship crews fire medium- and large-caliber guns at air targets.	Gunnery Exercise (Surface-to-Air)
Missile Exercise (Air-to-Air)	Fixed-wing aircrews fire air-to-air missiles at air targets.	Missile Exercise (Air-to-Air)
Missile Exercise (Surface-to-Air)	Surface ship crews fire surface-to-air missiles at air targets.	Missile Exercise (Surface-to-Air)
Anti-Submarine Warfare		
Torpedo Exercise – Submarine	Submarine crews search for, track, and detect submarines. Event would include one non-explosive MK-48 torpedo.	*[Similar activity previously analyzed in the 2015 NWTT Final EIS/OEIS under Testing (Table 2.8-2: Torpedo Non-Explosive Testing)]*
Tracking Exercise – Helicopter	Helicopter crews search for, track, and detect submarines.	Tracking Exercise – Helicopter
Tracking Exercise – Maritime Patrol Aircraft	Maritime patrol aircraft crews search for, track, and detect submarines.	Tracking Exercise – Maritime Patrol Aircraft
Tracking Exercise – Ship	Surface ship crews search for, track, and detect submarines.	Tracking Exercise – Ship
Tracking Exercise – Submarine	Submarine crews search for, track, and detect submarines.	Tracking Exercise – Submarine
Electronic Warfare		
Electronic Warfare Training – Aircraft	Aircraft and ship crews control portions of the electromagnetic spectrum used by enemy systems to degrade or deny the enemy's ability to take defensive actions.	Electronic Warfare Operations
Electronic Warfare Training – Ship		
Mine Warfare		
Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises	Maritime security personnel train to protect civilian ports and harbors against enemy efforts to interfere with access to those ports.	Maritime Homeland Defense/ Security Mine Countermeasures Integrated Exercises
Mine Neutralization – Explosive Ordnance Disposal Training	Personnel disable threat mines using explosive charges.	Mine Neutralization – Explosive Ordnance Disposal

Table 2.3-1: Training Activities Descriptions (continued)

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Surface Warfare		
Bombing Exercise (Air-to-Surface)	Fixed-wing aircrews deliver bombs against surface targets.	Bombing Exercise (Air-to-Surface)
Missile Exercise (Air-to-Surface)	Fixed-wing aircrews simulate firing precision-guided missiles, using captive air training missiles (CATMs) against surface targets. Some activities include firing a missile with a high-explosive (HE) warhead.	Missile Exercise (Air-to-Surface)
Gunnery Exercise (Surface-to-Surface) – Ship	Surface ship crews fire large-, medium-, and small-caliber guns at surface targets.	Gunnery Exercise (Surface-to-Surface) – Ship
Other Training		
Intelligence, Surveillance, Reconnaissance (ISR)	Maritime patrol aircraft (MPA), unmanned aerial systems, ships, and submarines use all available sensors to collect data on threat vessels.	Intelligence, Surveillance, Reconnaissance (ISR)
Maritime Security Operations	Helicopter, surface ship, and small boat crews conduct a suite of maritime security operations events, including maritime security escorts for Navy vessels such as submarines and aircraft carriers; Visit, Board, Search, and Seizure; Maritime Interdiction Operations; Force Protection; and Anti-Piracy Operations.	Maritime Security Operations
Personnel Insertion/ Extraction – Non-Submersible	Military personnel train for clandestine insertion and extraction into target areas using rotary-wing aircraft, fixed-wing aircraft (insertion only), or small boats.	Personnel Insertion/ Extraction – Non-Submersible
Precision Anchoring	Surface ship crews release and retrieve anchors in designated locations.	Precision Anchoring
Search and Rescue	Helicopter crews train to rescue military personnel at sea.	Search and Rescue
Small Boat Attack Exercise	Small boat crews engage pierside surface targets with small-caliber weapons. Only blank rounds are fired.	Small Boat Attack
Submarine Sonar Maintenance	Maintenance of submarine sonar and other system checks are conducted pierside or at sea.	Submarine Sonar Maintenance
Surface Ship Sonar Maintenance	Maintenance of surface ship sonar and other system checks are conducted pierside or at sea.	Surface Ship Sonar Maintenance
Unmanned Underwater Vehicle Training	Unmanned underwater vehicle certification involves training with unmanned platforms to ensure submarine crew proficiency. Tactical development involves training with various payloads for multiple purposes to ensure that the systems can be employed effectively in an operational environment.	*[Similar activity previously analyzed in the 2015 NWTT Final EIS/OEIS under Testing (Table-2.8-2: Unmanned Underwater Vehicle Testing)]*

Table 2.3-2: Naval Sea Systems Command Testing Activities Descriptions

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Anti-Submarine Warfare		
Anti-Submarine Warfare Testing	Ships and their supporting platforms (rotary-wing aircraft and unmanned aerial systems) detect, localize, and prosecute submarines.	Anti-Submarine Warfare Mission Package Testing
		Anti-Submarine Warfare Testing
At-Sea Sonar Testing	At-sea testing to ensure systems are fully functional in an open ocean environment.	*[Similar activity previously analyzed in the 2015 NWTT Final EIS/OEIS under Training (Table 2.8-1: Tracking Exercise – Surface)]*
Countermeasure Testing	Countermeasure testing involves the testing of systems that will detect, localize, and track incoming weapons, including marine vessel targets. Countermeasures may be systems to obscure the vessel's location or systems to rapidly detect, track, and counter incoming threats. Testing includes surface ship torpedo defense systems and marine vessel stopping payloads.	Countermeasures Testing
Pierside-Sonar Testing	Pierside testing to ensure systems are fully functional in a controlled pierside environment prior to at-sea test activities.	Pierside-Sonar Testing
Submarine Sonar Testing/Maintenance	Pierside, moored, and underway testing of submarine systems occurs periodically following major maintenance periods and for routine maintenance.	Project Operations (POPS)
Torpedo (Explosive) Testing	Air, surface, or submarine crews employ explosive and non-explosive torpedoes against artificial targets.	Torpedo (Explosive) Testing
Torpedo (Non-explosive) Testing	Air, surface, or submarine crews employ non-explosive torpedoes against targets, submarines, or surface vessels.	Torpedo (Non-explosive) Testing
Mine Warfare		
Mine Countermeasure and Neutralization Testing	Air, surface, and subsurface vessels neutralize threat mines and mine-like objects.	*[Not previously analyzed]*
Mine Detection and Classification Testing	Air, surface, and subsurface vessels and systems detect and classify mines and mine-like objects. Vessels also assess their potential susceptibility to mines and mine-like objects.	Side Scan/Multibeam Sonar

Table 2.3-2: Naval Sea Systems Command Testing Activities Descriptions (continued)

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Surface Warfare		
Kinetic Energy Weapon Testing	A kinetic energy weapon uses stored energy released in a burst to accelerate a projectile.	*[Not previously analyzed]*
Unmanned Systems		
Unmanned Aerial System Testing	Unmanned aerial systems are remotely piloted or self-piloted (i.e., preprogrammed flight pattern) aircraft that include fixed-wing, rotary-wing, and other vertical takeoff vehicles. They can carry cameras, sensors, communications equipment, or other payloads.	Unmanned Aircraft System
Unmanned Surface Vehicle System Testing	Unmanned surface vehicles are primarily autonomous systems designed to augment current and future platforms to help deter maritime threats. They employ a variety of sensors designed to extend the reach of manned ships.	Unmanned Surface Vehicle Testing
Unmanned Underwater Vehicle Testing	Testing involves the production or upgrade of unmanned underwater vehicles. This may include testing of mission capabilities (e.g., mine detection), evaluating the basic functions of individual platforms, or conducting complex events with multiple vehicles.	Unmanned Underwater Vehicle Testing
		Unmanned Vehicle Development and Payload Testing
		Performance Testing at Sea
		Proof of Concept Testing
		Development Training and Testing
Vessel Evaluation		
Propulsion Testing	Ship is run at high speeds in various formations and at various depths.	*[Not previously analyzed]*
Undersea Warfare Testing	Ships demonstrate capability of countermeasure systems and underwater surveillance, weapons engagement, and communications systems. This tests ships' ability to detect, track, and engage undersea targets.	*[Not previously analyzed]*
Vessel Signature Evaluation	Surface ship, submarine, and auxiliary system signature assessments. This may include electronic, radar, acoustic, infrared and magnetic signatures.	Electromagnetic Measurement
		Surface Vessel Acoustic Measurement Testing
		Underwater Vessel Acoustic Measurement Testing

Table 2.3-2: Naval Sea Systems Command Testing Activities Descriptions (continued)

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Other Testing		
Acoustic and Oceanographic Research	Research using active transmissions from sources deployed from ships, aircraft, and unmanned underwater vehicles. Research sources can be used as proxies for current and future Navy systems.	*[Not previously analyzed]*
Acoustic Component Testing	Various surface vessels, moored equipment, and materials are tested to evaluate performance in the marine environment.	Pierside Acoustic Testing
		Component System Testing
Cold Water Support	Fleet training for divers in a cold water environment, and other diver training related to Navy divers supporting range/test site operations and maintenance.	Cold Water Training
Hydrodynamic and Maneuverability Testing	Submarines maneuver in the submerged operating environment.	Underwater Vessel Hydrodynamic Performance Measurement
Non-Acoustic Component Testing	These tests involve non-acoustic sensors and communication systems. Non-acoustic sensors may also gather other forms of environmental data.	Non-Acoustic Tests
Post-Refit Sea Trial	Following periodic maintenance periods or repairs, sea trials are conducted to evaluate submarine propulsion, sonar systems, and other mechanical tests.	Post-Refit Sea Trial
Radar and Other System Testing	Testing may include use of military or commercial radar, communication systems (or simulators), or high-energy lasers. Testing may occur aboard a ship, helicopter, manned or unmanned underwater vehicle against drones, small boats, or other targets.	*[High-energy laser testing not previously analyzed]*
Semi-Stationary Equipment Testing	Semi-stationary equipment (e.g., hydrophones) is deployed to determine functionality.	Measurement System Repair and Replacement
		Target Strength Trial
		Acoustic Test Facility
Simulant Testing	The capability of surface ship defense systems to detect and protect against chemical and biological attacks are tested.	*[Not previously analyzed]*

Table 2.3-3: Naval Air Systems Command Testing Activities Descriptions

Activity Name	*Activity Description*	*2015 NWTT Final EIS/OEIS Activity Name*
Anti-Submarine Warfare		
Tracking Test – Maritime Patrol Aircraft	The test evaluates the sensors and systems used by maritime patrol aircraft to detect and track submarines and to ensure that aircraft systems used to deploy the tracking systems perform to specifications and meet operational requirements.	Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (DICASS)
		Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (MAC)
		Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (HDC)
		Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (IEER)
Tracking Test – Maritime Patrol Aircraft (SUS)	This test evaluates the sensors and systems used by maritime patrol aircraft to communicate with submarines using any of the family of signal underwater sound (SUS) sonobuoy systems.	Anti-Submarine Warfare Tracking Test – Maritime Patrol Aircraft (SUS)
Other Testing		
Intelligence, Surveillance, Reconnaissance (ISR)/Electronic Warfare (EW) Triton Testing	ISR/EW Triton Testing will evaluate the sensors and communication systems on board the MQ-4C Triton unmanned aerial system.	*[Not previously analyzed]*

2.3.3 Standard Operating Procedures

For training and testing to be effective, units must be able to safely use their sensors and weapon systems 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, and their primary purpose is to provide for safety (including public health and safety) and mission success. Because they are essential to safety and mission success, standard operating procedures are part of the Proposed Action and are considered in the Chapter 3 (Affected Environment and Environmental Consequences) environmental analysis for applicable resources.

In many cases, there are benefits to environmental and cultural resources (some of which have high socioeconomic value in the Study Area) resulting from standard operating procedures. Those standard operating procedures that are recognized as providing a benefit to the resources analyzed in this Final Supplemental EIS/OEIS are included in Appendix A (Navy Activities Descriptions), as applicable. The following standard operating procedure categories apply to the Proposed Action and are generally consistent with those included in the specified sections in Chapter 5 (Standard Operating Procedures, Mitigation, and Monitoring) of the 2015 NWTT Final EIS/OEIS:

- Section 5.1.1 (General Safety)
- Section 5.1.2 (Vessel Safety)
- Section 5.1.3 (Aircraft Safety)
- Section 5.1.4 (Laser Procedures)
- Section 5.1.5 (Weapons Firing Procedures)
- Section 5.1.7 (Unmanned Aircraft System Procedures)
- Section 5.1.8 (Unmanned Surface Vehicle and Unmanned Underwater Vehicle Procedures)
- Section 5.1.9 (Towed In-Water Device Procedures)
- Section 5.1.10 (Best Management Practices)

Standard operating procedures that apply to the Proposed Action and were not included in, or require a clarification from, the 2015 NWTT Final EIS/OEIS are discussed in the sections below.

2.3.3.1 High-Energy Laser Safety

The Navy operates laser systems approved for fielding by the Laser Safety Review Board or service equivalent. Only properly trained and authorized personnel operate high-energy lasers within designated areas. Designated areas where lasers are used are required to have a Laser Range Safety Certification Report that is updated every three years. Prior to commencing activities involving high-energy lasers, the operator performs a search of the intended impact location to ensure that the area is clear of unauthorized persons. These standard operating procedures benefit public health and safety by reducing the potential for interaction with high-energy lasers.

2.3.3.2 Sea Space and Airspace Deconfliction

The Navy schedules training and testing activities to minimize conflicts with the use of sea space and airspace within ranges and throughout the Study Area to ensure the safety of military personnel, the public, commercial aircraft, commercial and recreational vessels, and military assets. The Navy deconflicts its own use of sea space and airspace to allow for the necessary separation of multiple military units to prevent interference with equipment sensors and to avoid interaction with established commercial air traffic routes and commercial shipping lanes. The Navy also minimizes conflicts within

areas used for commercial and recreational fishing, Tribal or subsistence use, and tourism. During applicable seasons, the Navy works collaboratively with local Tribes and communities to deconflict certain sea spaces used for fishing, such as avoiding known fishery infrastructures (e.g., areas used for aquaculture) and usual and accustomed fishing grounds and stations. The Navy provides advanced notification directly to Tribes with treaty resources to deconflict schedules during certain activities conducted in select inland water locations when possible, such as providing training and testing scheduling information (e.g., a weekly schedule of activity and estimated usage time).

Military aircraft fly in accordance with FAA Regulations, Part 91, General Operating and Flight Rules, which govern such flight components as operating near other aircraft, right-of-way rules, aircraft speed, and minimum safe altitudes. These rules include the use of tactical training and maintenance test-flight areas, arrival and departure routes, and airspace restrictions as appropriate to help control air operations. It is the policy of Naval Air Station (NAS) Whidbey Island to investigate complaints to determine compliance with FAA regulations and NAS Whidbey Island standard operating procedures. These investigations ensure that both Navy and public interests are protected and provide ongoing communication between NAS Whidbey Island and the local communities. Persons with complaints or comments may call and leave a message on the complaint hotline at (360) 257-6665 or email comments.NASWI@navy.mil. In addition, the Navy's FAA-certified approach control deconflicts, through separation of altitude, timing, and distance, a combined air traffic scheme of military, commercial, and general aviation. All of these different types of aviation are arriving and departing from multiple airports located throughout the region. Navy aircraft depart NAS Whidbey Island and are under the control of the Navy's Approach Control and the FAA's control via the Seattle Air Route Traffic Control Center (ARTCC). They enter into the established routes of flight to and from the Olympic Military Operations Area (MOA) at altitudes of 12,000 to 18,000 feet (ft.) mean sea level (MSL). Aircraft remain under positive FAA control via Seattle ARTCC to and from the Olympic MOA. Aircraft are visible to both Navy and FAA radar and, once inside the Olympic MOA airspace, are subject to established FAA and Navy policies of use for the Olympic MOA. While in the Olympic MOA, they remain under FAA jurisdiction for airspace separation from commercial, private, and other military aircraft. Within the Olympic MOA, approximately 95 percent of Navy training flight time occurs at or above 10,000 ft. MSL.

In order to reach the Olympic MOA, aircraft fly west-southwest from NAS Whidbey Island over the Strait of Juan De Fuca, normally at or above 15,000 ft. MSL from a navigation point identified as MCCUL (20 NM west-southwest of NAS Whidbey Island), and then along a route of flight between MCCUL to a fixed navigation point (65 NM west-southwest of NAS Whidbey Island) where they cross into the boundary of the Olympic MOA (see Figure 2.3-1). Navy aircraft typically exit the Olympic MOA following Instrument Flight Rules clearance given by the Seattle ARTCC to the navigation point identified as YETII (30 NM southwest of NAS Whidbey Island). Normally aircraft cross YETII at or above 10,000 ft. MSL and then are directed to enter the arrival pattern to return to NAS Whidbey Island.

These standard operating procedures benefit public health and safety (including persons participating in activities that have subsistence benefits and socioeconomic value, such as recreational or commercial fishing) by reducing the potential for interactions with training and testing activities. Additional information on the Navy's communication and cooperation with Tribes and communities is presented in Section 3.11 (American Indian and Alaska Native Traditional Resources) and Section 3.12 (Socioeconomic Resources and Environmental Justice).

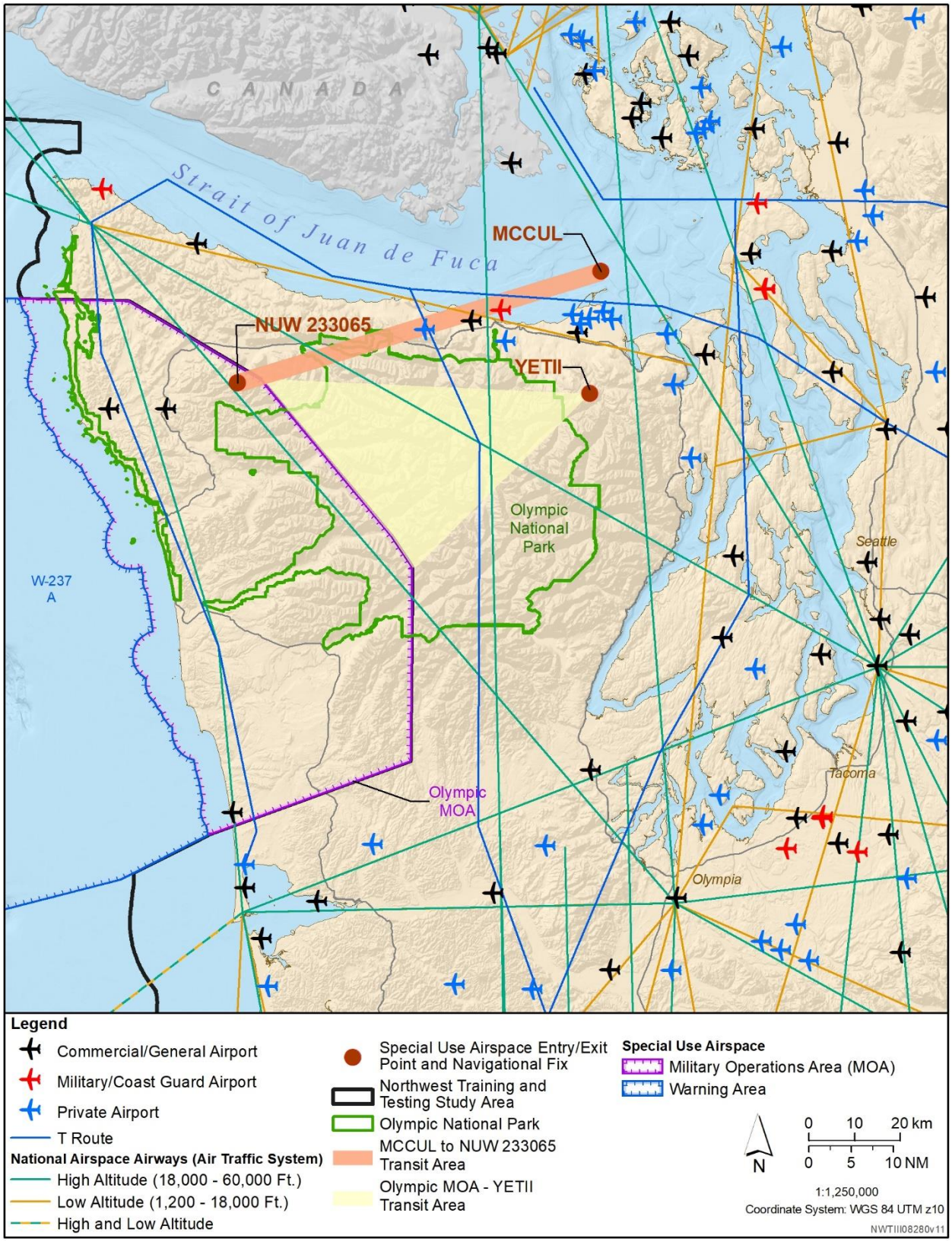

Figure 2.3-1: EA-18G Growler Aircraft Transit to and from Olympic Military Operations Area

2.3.3.3 Target Deployment and Retrieval Safety

The standard operating procedures for target deployment and retrieval safety apply to weapons firing activities that involve small boats deploying or retrieving targets. These activities are typically conducted in daylight hours in Beaufort Sea state number 4 conditions or better to ensure safe operating conditions during target deployment and recovery. These standard operating procedures benefit public health and safety, marine mammals, sea turtles, and seabirds by increasing the effectiveness of visual observations for mitigation, thereby reducing the potential for interactions with the weapons firing activities associated with the use of applicable deployed targets.

During activities that involve recoverable targets (e.g., aerial drones), the military recovers the target and any associated decelerators/parachutes to the maximum extent practicable consistent with personnel and equipment safety. Recovery of these items helps minimize the amount of materials that remain on the surface or on the seafloor, which could potentially alert enemy forces to the presence of military assets during military missions and combat operations. This standard operating procedure benefits biological resources (e.g., marine mammals, sea turtles, fish, seabirds) by reducing the potential for physical disturbance and strike, entanglement, or ingestion of applicable targets and any associated decelerators/parachutes.

2.3.3.4 Pierside Testing Safety

The *U.S. Navy Dive Manual* (U.S. Department of the Navy, 2011) prescribes safe distances for divers from active sonar sources and in-water explosions. Safety distances for the use of electromagnetic energy are specified in Department of Defense Instruction 6055.11 (U.S. Department of Defense, 2009) and Military Standard 464A (U.S. Department of Defense, 2002). These distances are used as the standard safety buffers for in-water energy to protect military divers. If an unauthorized person is detected within the exercise area, the activity will be temporarily halted until the area is again cleared and secured. These standard operating procedures benefit public health and safety (including persons participating in activities that have socioeconomic value, such as commercial or recreational diving) by reducing the potential for interaction with pierside testing activities.

2.3.3.5 Underwater Detonation Safety

Underwater detonation training takes place in designated exercise areas located away from popular recreational dive sites, primarily for human safety. If an unauthorized person (e.g., a recreational diver) or vessel is detected within the exercise area, the activity will be temporarily halted until the area is cleared and secured. Recreational dive sites often include artificial reefs and wrecks. Notices to Mariners are issued when the events are scheduled to alert the public to stay clear of the area. These standard operating procedures benefit public health and safety, environmental resources (e.g., artificial reefs and the biological resources such as fish that inhabit, shelter in, or feed among them), and cultural resources by reducing the potential for interaction with underwater detonation activities.

2.3.3.6 Sonic Booms

As a general policy, aircraft do not intentionally generate sonic booms below 30,000 ft. of altitude unless over water and more than 30 miles from inhabited land areas or islands. Within the Study Area, the Navy uses specifically designated areas to conduct supersonic flights during military readiness activities under the Proposed Action. These designated areas are not located over land or within 30 miles from inhabited land areas or islands. The Navy chose the designated areas to minimize the possibility of human disturbance; therefore, the standard operating procedures for sonic booms benefit public health and safety by reducing the potential for exposure to sonic booms.

2.3.4 Mitigation Measures

The Navy developed mitigation measures to avoid or reduce potential impacts from the Proposed Action on environmental and cultural resources. As a cooperating agency, the U.S. Coast Guard will implement the Navy's mitigation measures as applicable under the Proposed Action. Mitigation measures for the Proposed Action are organized into two categories: procedural mitigation and mitigation areas. The Navy will implement procedural mitigation measures whenever and wherever applicable training or testing activities take place within the Study Area. Mitigation areas are geographic locations within the Study Area where the Navy will implement additional mitigation during all or part of the year.

A list of the activity categories, stressors, and mitigation areas for which the Navy developed mitigation measures is provided in Table 2.3-4. Chapter 5 (Mitigation) of this Final Supplemental EIS/OEIS provides a full description of each mitigation measure that will be implemented under Alternative 1 and Alternative 2 of the Proposed Action. It also presents a discussion of how the Navy developed and assessed each measure and includes maps of the mitigation area locations. Mitigation developed for the Proposed Action is generally in line with the type of mitigation included in Chapter 5 (Standard Operating Procedures, Mitigation, and Monitoring) of the 2015 NWTT Final EIS/OEIS (U.S. Department of the Navy, 2015).

Table 2.3-4: Overview of Mitigation Categories

Mitigation Category	*Chapter 5 (Mitigation) Section*	*Applicable Activity Category, Stressor, or Mitigation Area*
Procedural Mitigation	Section 5.3.2 (Acoustic Stressors)	Active Sonar Weapons Firing Noise
	Section 5.3.3 (Explosive Stressors)	Explosive Sonobuoys Explosive Torpedoes Explosive Medium-Caliber and Large-Caliber Projectiles Explosive Missiles Explosive Bombs Explosive Mine Countermeasure and Neutralization Activities Explosive Mine Neutralization Activities Involving Navy Divers
	Section 5.3.4 (Physical Disturbance and Strike Stressors)	Vessel Movement Towed In-Water Devices Small-, Medium-, and Large-Caliber Non-Explosive Practice Munitions Non-Explosive Missiles Non-Explosive Bombs and Mine Shapes
Mitigation Areas	Section 5.4 (Mitigation Areas to be Implemented)	Seafloor Resource Mitigation Areas Marine Species Coastal Mitigation Area Olympic Coast National Marine Sanctuary Mitigation Area Juan de Fuca Eddy Marine Species Mitigation Area Stonewall and Heceta Bank Humpback Whale Mitigation Area Point St. George Humpback Whale Mitigation Area Northern Puget Sound Gray Whale Mitigation Area Puget Sound and Strait of Juan de Fuca Mitigation Area

The Navy has updated Chapter 5 (Mitigation) of this Final Supplemental EIS/OEIS in its entirety based on its ongoing analysis of the best available science and practicality of implementing potential mitigation measures. A full analysis of the mitigation areas the Navy developed for the Study Area is provided in Appendix K (Geographic Mitigation Assessment). Relevant mitigation details are also provided throughout Appendix A (Navy Activities Descriptions). The Navy Record of Decision will document all

mitigation measures the Navy will implement under the Proposed Action. The NMFS Record of Decision, MMPA Regulations and Letters of Authorization, Endangered Species Act (ESA) Biological Opinions, and other applicable consultation documents will include the mitigation measures applicable to the resources for which the Navy has consulted.

2.4 Action Alternatives Development

The identification, consideration, and analysis of alternatives are critical components of the National Environmental Policy Act process and contribute to the goal of objective decision-making. The Council on Environmental Quality (CEQ) developed regulations to implement National Environmental Policy Act and these regulations require the decision maker to consider the environmental effects of the proposed action and a range of alternatives (including the No Action Alternative) to the proposed action (40 Code of Federal Regulations [CFR] section 1502.14). CEQ guidance further provides that an EIS must rigorously and objectively explore all reasonable alternatives for implementing the proposed action and, for alternatives eliminated from detailed study, briefly discuss the reasons for having been eliminated. To be reasonable, an alternative, except for the no action alternative, must meet the stated purpose of and need for the proposed action.

The action alternatives, and in particular the mitigation measures that are incorporated in the action alternatives, were developed to meet both the Navy's purpose and need to train and test, and NMFS's independent purpose and need to evaluate the potential impacts of the Navy's activities, determine whether incidental take resulting from the Navy's activities would have a negligible impact on affected marine mammal species and stocks, and to prescribe measures to effect the least practicable adverse impact on species or stocks and their habitat, as well as monitoring and reporting requirements.

The Navy developed the alternatives considered in this Supplemental after careful assessment by subject matter experts, including military commands that utilize the ranges, military range management professionals, and Navy environmental managers and scientists.

For example, the Optimized Fleet Response Plan, discussed in Section 1.4.2 (Optimized Fleet Response Training), changed how the Navy meets its readiness requirements. The data developed from the Optimized Fleet Response Plan informs the level of training, including the use of sonar sources and explosives, required by the Navy to meet its Title 10 responsibilities, which includes to maintain, train, and equip combat ready forces.

Through the analysis of several years of classified sonar use data, cross referenced with training requirements of the same period, the Navy produced a more refined estimate for the amount of sonar use anticipated to meet future training requirements, which supports the development of action alternatives.

With regards to testing activities, as previously stated, the level of activity in any given year is highly variable and is dependent on technological advancements, emergent requirements identified during operations, and fiscal fluctuations. Therefore, the environmental analysis must consider all testing activities that could possibly occur to ensure that the analysis fully captures the potential environmental effects. These factors were considered in alternatives carried forward for consideration and analyses as described in Section 2.4.2 (Alternatives Carried Forward).

2.4.1 Alternatives Eliminated from Further Consideration

This Supplemental serves as an update to the 2015 NWTT Final EIS/OEIS; therefore, alternatives eliminated from consideration in the 2015 NWTT Final EIS/OEIS were evaluated to determine if they should be reconsidered for this Supplemental and are discussed below. In response to the comments received during the public scoping period, the Navy also considered developing an alternative that included geographic mitigation. Alternatives eliminated from further consideration are described below. The Navy determined that these alternatives did not meet the purpose of and need for the Proposed Action after a thorough consideration of each. Alternatives considered but not carried forward are discussed below.

2.4.1.1 Alternative Training and Testing Locations

As described in Section 2.5.1.1 (Alternative Locations) in the 2015 NWTT Final EIS/OEIS, there is no other set of integrated ranges in the Pacific Northwest that affords this level of operational support for local range users. The Navy reevaluated the availability of other suitable locations that can support the training and testing requirements in the Pacific Northwest.

2.4.1.2 Alternative EA-18G Growler Training and Testing Locations

Section 2.4.1.1 applies to all training and testing activities conducted in the NWTT Study Area. In response to concerns raised during review of the Draft Supplemental EIS/OEIS, the following information is provided regarding the feasibility of an alternative that includes using alternative training locations for the EA-18G Growler. When considering training requirements for EA-18G Growler and other locally-based aircrew, several specific factors determine where training can occur.

Size. Airspace suitable for aircrew training must be of adequate size to allow for the aircraft to maneuver vertically and laterally without conflicting with non-participating aircraft (commercial, private, and other military). The FAA has established special use airspace (SUA) for this reason. SUA includes Warning Areas, Restricted Areas, and MOAs that can provide military aircraft a location to conduct maneuvering without creating safety conflicts with other aircraft. There are a limited number of MOAs available across the country to meet critical military training requirements. Generally, MOAs, established by the FAA, are set over isolated, rural areas that have the least impact on highly populated areas and the national airspace system. For example, the Olympic MOA was established by the FAA in 1977, specifically to support military aircraft training. Training in areas that don't provide SUA of suitable size would not allow aircrew to meet training requirements.

Proximity. Airspace must be within the vicinity of the aircraft home airfield. Aircraft training needs to occur near enough to the aircraft home base to allow aircraft to fly to the airspace with enough fuel to conduct the required training and return to home base with adequate fuel margin. This range varies among different aircraft but, for the Growler, this typically limits the airspace to within 100–200 miles of the home airfield. Training conducted in areas farther than this would not allow aircrew adequate training time in the airspace, or would not provide sufficient fuel safety margins upon their return to the airfield.

Special Capabilities. Aircrew electronic warfare training requires airspace that supports that training. In the case of Growlers, a required capability would include mobile and fixed electronic emitters. Training in areas without this electronic warfare emitter capability would reduce the effectiveness of required advanced training for aircrew.

Capacity. Due to the number of aircraft flights required to meet Growler aircrew training requirements, multiple airspace areas are needed. The Navy uses all of these areas to conduct training for EA-18G, P-8, and EP-3 aircrew. Without any one of these areas, the Navy would lose the ability to complete training requirements for these aircrew. While there are additional SUA areas across the United States, those areas have been established to support their local military aircraft activities, and would not provide the capacity to support additional Navy training.

The Navy determined that these factors are all still required, and that there are no other suitable locations with those attributes. For all of the reasons described above, an alternative that would eliminate or reduce training in currently used areas has been eliminated from further consideration in this Supplemental because it does not meet the purpose of and need for the Proposed Action.

2.4.1.3 Reduced Training and Testing

As described in Section 2.5.1.2 (Reduced Training and Testing) in the 2015 NWTT Final EIS/OEIS, a reduction or cessation of training and testing would prevent the Navy from meeting its statutory requirements and adequately preparing naval forces for operations at sea ranging from disaster relief to armed conflict. The Navy has determined that Alternative 1 represents the baseline to meet the mission and is the minimum training for the appropriate number of Naval forces to gain the necessary levels of readiness in order for the Navy to meet all operational requirements as dictated by operational Commanders. Therefore, this alternative has been eliminated from further consideration in this Supplemental because it does not meet the purpose of and need for the Proposed Action.

2.4.1.4 Alternatives Including Geographic Mitigation Measures Within the Study Area

The Navy considered, but did not develop, an alternative based solely on geographic mitigation that would impose geographic or temporal restrictions on specific areas in the Study Area, such as areas associated with the presence of specific species. Such an alternative would present a patchwork of areas and time periods in which the Navy could conduct required training and testing, preventing the Navy from conducting the full scope of activities necessary to fulfill its Title 10 responsibilities, and is counter to the purpose and need of the Proposed Action. Thus, such an alternative would not be reasonable. Further, regulations governing NEPA allow agencies to "Include appropriate mitigation measures not already included in the proposed action or alternatives" (40 CFR 1502.14[f]). The Navy designed its alternatives development and mitigation development processes to ensure the maximum level of mitigation that is practical to implement when balanced against impacts to safety, sustainability, and the ability to continue meeting mission requirements would be implemented, regardless of the action alternative selected. Under both action alternatives carried forward, the Navy would implement geographic mitigation that is both biologically effective as well as practical to implement. Developing geographic mitigation for both action alternatives is a more conservative (i.e., more environmentally protective) approach than developing geographic mitigation for one action alternative but not the other. Mitigation areas developed for the Proposed Action are detailed in Appendix K (Geographic Mitigation Assessment).

2.4.1.5 Simulated Training and Testing Only

As discussed in Section 1.4.1 (Why the Navy Trains) of the 2015 NWTT Final EIS/OEIS, simulators and synthetic training are critical elements that provide early skill repetition and enhance teamwork aboard vessels and in aircraft. The Navy currently uses simulation whenever possible (e.g., initial basic systems training, emergency procedures, and command and control exercises that are conducted without operational forces); and simulation plays a role in both antisubmarine warfare training and testing

aboard ships, submarines, and aircraft; and in aircrew training and testing. However, there are significant limitations to simulation, and its use cannot replace live training or testing.

Antisubmarine Warfare Training and Testing. To detect and counter mine shapes and hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. More than 300 extremely quiet, newer-generation submarines are operated by more than 40 nations worldwide, and these numbers are growing. These difficult-to-detect submarines, as well as torpedoes and underwater mines, are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy. Anti-submarine warfare training and testing activities include the use of active and passive sonar systems and small explosive charges, which prepare and equip Sailors for countering threats. Inability to train with sonar would eliminate or diminish anti-submarine warfare readiness. Failure to detect and defend against hostile submarines can cost lives, such as the 46 Sailors who lost their lives when a Republic of Korea frigate (CHEONAN) was sunk by a North Korean submarine in March 2010.

There are limits to the realism that current simulation technology can presently provide. Unlike live training, today's simulation technology does not permit anti-submarine warfare training with the degree of realism and complexity required to maintain proficiency. While simulators are used for the basic training of sonar technicians, they are of limited value beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments.

Sonar operators must train regularly and frequently to develop and maintain the skills necessary to master the process of identifying underwater threats in the complex subsurface environment. Sole reliance on simulation would deny service members the ability to develop battle-ready proficiency in the employment of active sonar in the following areas:

- Bottom bounce and other environmental conditions. Sound hitting the ocean floor (bottom bounce) reacts differently depending on the bottom type and depth. Likewise, sound passing through changing currents, eddies, or across differences in ocean temperature, pressure, or salinity is also affected. Both of these are extremely complex and difficult to simulate, and both are common in actual sonar operations.
- Mutual sonar interference. When multiple sonar sources are operating in the vicinity of each other, interference due to similarities in frequency can occur. Again, this is a complex variable that must be recognized by sonar operators, but is difficult to simulate with any degree of fidelity.
- Interplay between ship and submarine target. Ship crews, from the sonar operator to the ship's Captain, must react to the changing tactical situation with a real, thinking adversary (a Navy submarine for training purposes). Training in actual conditions with actual submarine targets provides a challenge that cannot be duplicated through simulation.
- Interplay between anti-submarine warfare teams in the strike group. Similar to the interplay required between ships and submarine targets, a ship's crew must react to all changes in the tactical situation, including changes from cooperating ships, submarines, and aircraft.

Similar to the challenges presented in the training situations above, while simulation can be used during the initial stages of development, operational testing cannot be based exclusively on computer modeling or simulation (see 10 United States Code sections 2366 and 2399). Although simulation is a key component in platform and systems development, it does not adequately provide information on how a system will perform or whether it will be available to meet performance and other specification requirements because of the complexity of the technologies in development and marine environments in which they will operate. At-sea testing provides the critical information on operability and supportability needed by the Navy to make decisions on the procurement of platforms and systems, ensuring that what is purchased performs as expected and that tax dollars are not wasted. Meeting this testing requirement is also critical to protecting the Sailors who depend on these technologies to execute their mission with minimal risk to themselves. For this reason, at some point in the development process, platforms and systems must undergo at-sea testing.

Aircrew Training and Testing. There are many increasing demands that go along with efforts to maintain aircrew readiness, including extending the life of aircraft, reducing costs, supplementing training range inadequacies, security considerations, rising systems costs, personnel and equipment limitations, and reducing effects on the human environment. In an effort to address these demands, aircraft squadrons based at NAS Whidbey Island are already implementing measures that result in minimizing flights in assigned airspace areas. The extensive use of EA-18G Growler flight simulators currently satisfies a number of these demands and a significant portion of flight training requirements.

Since the 2015 NWTT Final EIS/OEIS, new EA-18G simulation technology has been made available. One example is the use of synthetic inject training during live training events to replicate the use of actual aircraft. Normally in a typical air combat training event, multiple aircraft are used, with one or more aircraft taking the role of an aggressor while the other aircraft take the defending role. With this synthetic inject technology, computer generated aircraft (synthetic targets) are injected into the onboard systems of EA-18G aircraft during live training events. With the synthetic interjection, a virtual aircraft, instead of an actual aircraft, becomes one side of the engagement with the result of fewer real aircraft being present in the airspace during training.

Live training can be optimized and augmented through the use of simulation and advances in technologies such as synthetic inject training that improve the effectiveness of simulations and reduce flight time. The Navy has learned how to best prepare pilots for very demanding tasks and has folded simulated training into its training cycle to a degree and level that still enables pilots to safely and effectively react to the stresses of military operations when required.

However, even given these capabilities, live flight training and testing is an absolute necessity in order to prepare and qualify military aircrews for military operations or to complete operational testing, and cannot currently be replaced with simulation-only training and testing. Simulated training does not adequately replace the stresses imposed by live flight training, and actual flight testing is necessary to ensure systems perform to requirements. Simulated flight cannot replace the feel and physiological conditions experienced through live training in a real aircraft, in real airspace, for perfecting air combat maneuvers and identification of threats. Just as a pilot would not be ready to fly solo after simulator training, operational Commanders cannot allow military personnel to engage in military missions and combat operations based merely on simulator training.

Summary. For the reasons stated above, simulation as an alternative that replaces training and testing in the field does not meet the purpose of and need for the Proposed Action and has been eliminated from detailed study.

2.4.1.6 Training and Testing Without the Use of Active Sonar

In order to detect and counter submerged mines and potentially hostile submarines, the Navy uses both passive and active sonar. Sonar proficiency is a complex and perishable skill that requires regular, hands-on training in realistic and diverse conditions. Training and testing with active sonar is needed to find and counter newer-generation submarines around the world, which are growing in number, as are torpedoes and underwater mines, which are true threats to global commerce, national security, and the safety of military personnel. As a result, defense against enemy submarines is a top priority for the Navy. The detection and countering of submarines is paramount to national security. Naval forces cannot counter this threat without the use of active sonar. Because the Navy is statutorily responsible to provide combat-ready forces to operational Commanders, it must train in a manner in which it will be utilized in military operations. Accordingly, training and testing without active sonar is not a reasonable alternative and will not be carried forward.

2.4.1.7 "Status Quo" Alternative

The Navy considered a Status Quo Alternative based on the 2015 NWTT Final EIS/OEIS Preferred Alternative (Section 2.7, Alternative 1: Adjustments to the Baseline and Additional Weapons, Platforms, and Systems) and 2016 NWTT EIS/OEIS Record of Decision. Under such an alternative, the Navy would continue the present course of action, such as continuation of Navy training and testing in the NWTT Study Area at current levels documented in the 2016 NWTT EIS/OEIS Record of Decision, and requesting separate authorizations under the MMPA and ESA as required. The Navy could continue to conduct training and testing activities, but not at the level and scope of activities necessary to fulfill its Title 10 responsibilities described in the Purpose and Need of the Proposed Action. A Status Quo Alternative would lock the Navy into using obsolete systems and platforms, and unneeded training, and would not allow for new testing requirements, and therefore would not allow the Navy to meet future training and testing requirements necessary to achieve and maintain fleet readiness. Thus, such an alternative would not be reasonable and has been eliminated from detailed study.

2.4.2 Alternatives Carried Forward

The Navy's anticipated level of training and testing activity evolves over time based on numerous factors. Over the past several years, the Navy's ongoing sonar reporting program has gathered classified data regarding the number of hull-mounted mid-frequency active sonar hours used to meet anti-submarine warfare requirements. These data allow for a more accurate projection of the number of active sonar hours required to meet anti-submarine warfare training requirements into the reasonably foreseeable future. As previously discussed, in addition to meeting the Navy's purpose and need to train and test, the action alternatives, and in particular the mitigation measures that are incorporated in the action alternatives, were developed to meet NMFS's independent purpose and need to evaluate the potential impacts of the Navy's activities, determine whether incidental take resulting from the Navy's activities would have a negligible impact on affected marine mammal species and stocks, and prescribe measures to effect the least practicable adverse impact on species or stocks and their habitat, as well as monitoring and reporting requirements.

2.4.2.1 No Action Alternative

As mentioned in Section 2.4 (Action Alternatives Development), the CEQ implementing regulations require that a range of alternatives to the proposed action, including a No Action Alternative, be analyzed to provide a clear basis for choice among options by the decision maker and the public (40 CFR 1502.14). CEQ guidance identifies two approaches in developing the No Action Alternative (46 *Federal Register* 18026). One approach is applicable to ongoing, continuing actions as the present course of action under the current management direction or intensity. For example, the continuation of training and testing activities conducted at levels analyzed in the 2015 NWTT Final EIS/OEIS could be a viable No Action Alternative, even if separate authorizations under the MMPA and ESA are required to continue the activities. Under this approach, which was used in the 2015 NWTT Final EIS/OEIS, the analysis compares the effects of continuing current activity levels (i.e., the "status quo") with the effects of the Proposed Action. The second approach depicts a scenario where no authorizations or permits are issued, in which the proposed action does not take place, and the resulting environmental effects from taking no action are compared with the effects of implementing the proposed action. The Navy applied the second approach in this Supplemental as it further supports NMFS' regulatory process by presenting the scenario where no authorization will be issued. Additionally, the second approach responds to comments submitted at various stages regarding the 2015 NWTT Final EIS/OEIS and during the scoping process of this Supplemental.

Under the No Action Alternative analyzed in this Supplemental, the Navy would not conduct the proposed training and testing activities in the NWTT Study Area. Consequently, the No Action Alternative of not conducting the proposed live, at-sea training and testing activities in the Study Area is inherently unreasonable in that it does not meet the purpose and need (see Section 1.4, Purpose and Need) for the reasons noted below. However, the analysis associated with the No Action Alternative is carried forward in order to compare the magnitude of the potential environmental effects of the Proposed Actions with the conditions that would occur if the Proposed Action did not occur (see Section 3.0.1, Overall Approach to Analysis).

From NMFS' perspective, pursuant to its obligation to grant or deny permit applications under the MMPA, the No Action Alternative involves NMFS denying Navy's application for an incidental take authorization under Section 101(a)(5)(A) of the MMPA. If NMFS were to deny the Navy's application, the Navy would not be authorized to incidentally take marine mammals and the Navy would not conduct the proposed training and testing activities in the NWTT Study Area.

Cessation of proposed Navy at-sea training and testing activities would mean that the Navy would be unable to (1) meet its statutory requirements, (2) adequately prepare to defend itself and the United States from enemy forces, (3) successfully detect enemy submarines, and (4) 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 be taught how to use Navy systems in any realistic scenario in the Study Area. For example, sonar proficiency, which is a complex and perishable skill, requires regular, hands-on training in realistic and diverse conditions. In order to detect and counter hostile submarines, the Navy uses both passive and active sonar. Inability to train with active sonar would result in greatly diminished anti-submarine warfare capability.

Additionally, without proper training, individual Sailors and Marines serving onboard Navy vessels would not be taught how to properly operate complex equipment in inherently dynamic and dangerous

environments. Even with high levels of training, injuries, and sometimes even death occur. Therefore, without proper training, it is likely that there would be an increase in the number of mishaps, potentially resulting in the death or serious injury of Sailors and Marines. Failing to allow our Sailors and Marines to achieve and maintain the skills necessary to defend the United States and its interests will result in an unacceptable increase in the danger they willingly face.

Finally, the lack of live training and testing would require a complete reliance on simulated training and testing. While the Navy continues to research new ways to provide realistic training through simulation, there are limits to the realism that technology provides. While simulators are used for the basic training of sonar technicians, they are of limited utility beyond basic training. A simulator cannot match the dynamic nature of the environment, such as bathymetry and sound propagation properties, or the training activities involving several units with multiple crews interacting in a variety of acoustic environments. Sole reliance on simulation would deny Sailors the ability to develop battle-ready required proficiency in the employment of active sonar during military operations (Section 2.4.1.5, Simulated Training and Testing Only; and Section 2.4.1.6, Training and Testing Without the Use of Active Sonar).

2.4.2.2 Alternative 1 (Preferred Alternative)

Alternative 1 is the Preferred Alternative. Alternative 1 reflects a representative year of training and testing to account for the natural 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.

2.4.2.2.2 Training

Under this alternative, the Navy proposes to conduct military readiness activities into the reasonably foreseeable future, as necessary to meet current and future readiness requirements. These military readiness activities include new activities as well as activities subject to previous analysis that are currently ongoing and have historically occurred in the Study Area. The requirements for the types of activities to be conducted, as well as the intensity at which they need to occur, have been validated by senior Navy leadership. Specifically, training activities are based on the requirements of the Optimized Fleet Response Plan (Section 1.4.2, Optimized Fleet Response Training) and on changing world events, advances in technology, and Navy tactical and strategic priorities. These activities account for force structure changes and include training with new aircraft, vessels, unmanned/autonomous systems, and weapon systems that will be introduced to the Fleets after November 2020. The numbers and locations of all proposed training activities are provided in Table 2.5-1.

Using a representative level of activity rather than a maximum tempo of training activity in every year has reduced the amount of hull-mounted mid-frequency active sonar estimated to be necessary to meet training requirements. Under Alternative 1, the Navy assumes that some unit-level training would be conducted using synthetic means (e.g., simulators). Additionally, this alternative assumes that some unit-level active sonar training will be completed through other training exercises. By using a representative level of training activity rather than a maximum level of training activity in every year, this alternative accepts a degree of risk that if global events necessitated a rapid expansion of military training that the Navy would not have sufficient capacity in its MMPA and ESA authorizations to carry out those training requirements.

The Optimized Fleet Response Plan and various training plans identify the number and duration of training cycles that could occur. Alternative 1 considers fluctuations in training cycles and deployment

schedules that do not follow a traditional annual calendar but instead are influenced by in-theater demands and other external factors. This alternative takes a similar approach to estimating unit-level training.

2.4.2.2.3 Testing

Under Alternative 1, the Navy proposes an annual level of testing that reflects the fluctuations in testing programs by recognizing that the maximum level of testing will not be conducted each year. This alternative includes the testing of new platforms, systems, and related equipment that will be introduced after November 2020. The majority of testing activities that would be conducted under this alternative are the same as or similar to those conducted currently or in the past. This alternative includes the testing of some new systems using new technologies and takes into account inherent uncertainties in this type of testing. The numbers and locations of all proposed testing activities are listed in Table 2.5-2 and Table 2.5-3.

2.4.2.2.4 Mitigation Measures

The Navy's entire suite of mitigation measures was applied to Alternative 1 to ensure that: (1) the benefit of mitigation measures to environmental and cultural resources was considered during the applicable environmental analyses, and (2) Navy Senior Leadership approved each mitigation measure included in this Final Supplemental EIS/OEIS under Alternative 1. Navy Senior Leadership reviewed relevant supporting information to make a fully informed decision, including the benefit of mitigation measures to environmental and cultural resources, and the impacts that implementing mitigation will have on training and testing activities under Alternative 1. As discussed in Chapter 5 (Mitigation) and Appendix K (Geographic Mitigation Assessment), the suite of mitigation measures included in this Final Supplemental EIS/OEIS represents the maximum level of mitigation that is practical for the Navy to implement when balanced against impacts to safety, sustainability, and the ability to continue meeting mission requirements.

2.4.2.3 Alternative 2

2.4.2.3.2 Training

Alternative 2 reflects the maximum number of training activities that could occur within a given year and assumes that the maximum level of activity would occur every year for the reasonably foreseeable future. As under Alternative 1, this alternative includes new and ongoing activities. Under Alternative 2, training activities are based on requirements established by the Optimized Fleet Response Plan. 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. The numbers and locations of all proposed training activities are provided in Table 2.5-1.

2.4.2.3.3 Testing

Alternative 2 assumes that the maximum annual testing efforts predicted for each individual system or program could occur concurrently in any given year. Like Alternative 1, Alternative 2 entails a level of testing activities to be conducted into the reasonably foreseeable future and includes the testing of new platforms, systems, and related equipment that will be introduced after November 2020. The majority

of testing activities that would be conducted under this alternative are the same as or similar to those conducted currently or in the past.

Alternative 2 would include the testing of some new systems using new technologies, taking into account the potential for delayed or accelerated testing schedules, variations in funding availability, and innovations in technology development. To account for these inherent uncertainties in testing, this alternative assumes a higher annual level of testing than Alternative 1. This alternative also includes the contingency for augmenting some weapon systems tests in response to potential increased world conflicts and changing Navy leadership priorities as the result of a direct challenge from a naval opponent that possesses near-peer capabilities. Therefore, this alternative includes the provision for higher levels of vessel evaluations, annual testing of certain anti-submarine warfare systems and unmanned systems to support expedited delivery of these systems to the Fleet, and increases in other testing activities. All proposed testing activities are listed in Table 2.5-2 and Table 2.5-3.

2.4.2.3.4 Mitigation Measures

The Navy's entire suite of mitigation measures was applied to Alternative 2 to ensure that: (1) the benefit of mitigation measures to environmental and cultural resources was considered during the applicable environmental analyses, and (2) Navy Senior Leadership approved each mitigation measure included in this Final Supplemental EIS/OEIS under Alternative 2. Navy Senior Leadership reviewed relevant supporting information to make a fully informed decision, including the benefit of mitigation measures to environmental and cultural resources, and the impacts that implementing mitigation will have on training and testing activities under Alternative 2. As discussed in Chapter 5 (Mitigation) and Appendix K (Geographic Mitigation Assessment), the suite of mitigation measures included in this Final Supplemental EIS/OEIS represents the maximum level of mitigation that is practical for the Navy to implement when balanced against impacts to safety, sustainability, and the ability to continue meeting mission requirements.

2.5 Comparison of Alternatives

For a comparison of acoustic and explosive stressors associated with the proposed activities, refer to Table 3.0-2 and Table 3.0-7. These tables reflect changes in proposed explosive and acoustic source requirements, as the Navy's training and testing needs have changed since the 2015 NWTT Final EIS/OEIS.

The following tables compare the proposed Supplemental action alternatives (Alternative 1 and Alternative 2) with the current training and testing activities described under Alternative 1 in the 2015 NWTT Final EIS/OEIS. Each table describes the activities in terms of the activity name and where in the Study Area the Navy proposes to conduct it (first two columns). The next two columns show the annual occurrence and ordnance or other expended items (if any) involved in the activity as is currently ongoing (under the heading "2015 NWTT EIS/OEIS Ongoing Activities"). The final two pairs of columns present the same information (annual occurrence and ordnance/items) as the activities are analyzed in this Supplemental for Alternative 1 and Alternative 2, respectively.

Table 2.5-1 is the table of training activities, Table 2.5-2 is the table of Naval Sea Systems Command testing activities, and Table 2.5-3 is the table of Naval Air Systems Command testing activities.

Table 2.5-1: Current and Proposed Training Activities

Range Activity	*Location*	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*
Air Warfare							
Air Combat Maneuver (ACM)	Offshore Area (W-237)	550[2]	None	126[2]	None	126[2]	None
	Offshore Area (Olympic MOA)			574[2]	None	574[2]	None
Gunnery Exercise (Surface-to-Air) (GUNEX [S-A])	Offshore Area (W-237)	160	Large-caliber rounds (230 explosive, 80 NEPM) Medium-caliber rounds (6,320 explosive, 9,672 NEPM)	125	Large-caliber rounds (80 NEPM) Medium-caliber rounds (9,660 NEPM)	160	Large-caliber rounds (230 explosive, 6,670 NEPM) Medium-caliber rounds (6,240 explosive, 9,680 NEPM)
Missile Exercise (Air-to-Air) (MISSILEX [A-A])	Offshore Area (W-237)	24	AIM-7/9/120 (15 explosive warheads, 15 NEPM warheads)	0–4	AIM-7/9/120 (4 explosive warheads, 4 NEPM warheads)	24	AIM-7/9/120 (15 explosive warheads, 15 NEPM warheads)
Missile Exercise (Surface-to-Air) (MISSILEX [S-A])	Offshore Area (W-237)	4	RIM-7/116 (8 explosive warheads)	0–4	RIM-7/116 (8 explosive warheads)	4	RIM-7/116 (8 explosive warheads)
Anti-Submarine Warfare							
Torpedo Exercise – Submarine (TORPEX - Sub)	Offshore Area	Not Analyzed[3]	Not Analyzed	0–2	2 MK-48 Torpedoes (non-explosive)	2	2 MK-48 Torpedoes (HE)
Tracking Exercise – Helicopter (TRACKEX – Helo)	Offshore Area	4	None	0–2	None	4	None

Table 2.5-1: Current and Proposed Training Activities (continued)

Range Activity	Location	2015 NWTT EIS/OEIS Ongoing Activities		Supplemental			
				Alternative 1 (Preferred)		Alternative 2	
		No. of events (annual)	Ordnance (Number per year)	No. of events [1] (annual)	Ordnance (Number per year)	No. of events [1] (annual)	Ordnance (Number per year)
Anti-Submarine Warfare (continued)							
Tracking Exercise – Maritime Patrol Aircraft (TRACKEX – MPA)	Offshore Area	324	None	373	16 Torpedoes (non-explosive)	373	16 Torpedoes (non-explosive)
Tracking Exercise – Ship (TRACKEX – Ship)	Offshore Area	65	None	62	None	65	None
Tracking Exercise – Submarine (TRACKEX – Sub)	Offshore Area	100	None	75-100	None	100	None
Electronic Warfare							
Electronic Warfare Training – Aircraft (EW Training)	Offshore Area (W-237)	1,062 [4]	None	1,062 [4]	None	1,062 [4]	None
	Offshore Area (Olympic MOA)	3,938 [4]		3,938 [4]	None	3,938 [4]	None
Electronic Warfare Training – Ship (EW Training)	Offshore Area (W-237), Inland Waters	275	None	220	None	275	None
Mine Warfare							
Civilian Port Defense – Homeland Security Anti-Terrorism/Force Protection Exercises	Inland Waters	Every other year (three in 5 years)	None	0–1	None	1	None

Table 2.5-1: Current and Proposed Training Activities (continued)

Range Activity	Location	2015 NWTT EIS/OEIS Ongoing Activities		Supplemental			
				Alternative 1 (Preferred)		Alternative 2	
		No. of events (annual)	Ordnance (Number per year)	No. of events [1] (annual)	Ordnance (Number per year)	No. of events [1] (annual)	Ordnance (Number per year)
Mine Warfare (continued)							
Mine Neutralization – Explosive Ordnance Disposal (EOD) Training	Crescent Harbor EOD Training Range	3	Three 2.5 lb. charges	3	Three 2.5 lb. charges	5	Five 2.5 lb. charges
		3	Eighteen <0.1 lb. charges	3	Eighteen <0.1 lb. charges	5	Thirty <0.1 lb. charges
	Hood Canal EOD Training Range	3	Three 2.5 lb. charges	3	Three 2.5 lb. charges	5	Five 2.5 lb. charges
		3	Eighteen <0.1 lb. charges	3	Eighteen <0.1 lb. charges	5	Thirty <0.1 lb. charges
Submarine Mine Exercise	Offshore Area	8	None	Discontinued		Discontinued	
Surface Warfare							
Bombing Exercise (Air-to-Surface) (BOMBEX [A-S])	Offshore Area (W-237)	30	BDU-45, MK-84 bombs (10 explosive, 110 NEPM)	0–28	BDU-45 series bombs (84 NEPM)	30	BDU-45 series bombs (110 NEPM)
				0–2	MK-80 series bombs (2 explosive)	2	MK-80 series bombs (10 explosive)
Gunnery Exercise (Surface-to-Surface) – Ship (GUNEX [S-S] – Ship)	Offshore Area	200	Small-caliber rounds (121,200 NEPM) Medium-caliber rounds (48 explosive, 33,492 NEPM) Large-caliber rounds (80 explosive, 2,720 NEPM)	100–200	Small-caliber rounds (121,000 NEPM) Medium-caliber rounds (250 explosive, 16,750 NEPM) Large-caliber rounds (112 explosive, 2,720 NEPM)	200	Small-caliber rounds (121,000 NEPM) Medium-caliber rounds (250 explosive, 33,492 NEPM) Large-caliber rounds (160 explosive, 2,720 NEPM)

Table 2.5-1: Current and Proposed Training Activities (continued)

Range Activity	*Location*	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*
Surface Warfare (continued)							
Missile Exercise (Air-to-Surface) (MISSILEX [A-S])	Offshore Area (W-237)	4	AGM-84 (4 explosive missiles)	0–2	AGM-84 (2 explosive missiles)	4	AGM-84 (4 explosive missiles)
Other Training							
Intelligence, Surveillance, Reconnaissance (ISR)	Offshore Area Inland Waters	200	None	No Change		No Change	
Maritime Security Operations	Inland Waters	286	1,320 small-caliber rounds (all blanks)	220	1,320 small-caliber rounds (all blanks)	286	1,320 small-caliber rounds (all blanks)
Personnel Insertion/ Extraction – Non-Submersible	Inland Waters	10	None	6	None	10	None
Personnel Insertion/ Extraction – Submersible	Inland Waters	35	None	0 [5]	None	0 [5]	None
Precision Anchoring	Inland Waters	10	None	30–40	None	40	None
Search and Rescue	Inland Waters	100	None	80	None	100	None
Small Boat Attack Exercise	NS Everett NBK Bangor NBK Bremerton	1	3,000 small-caliber rounds (all blanks)	1	3,000 small-caliber rounds (all blanks)	2	6,000 small-caliber rounds (all blanks)
Submarine Sonar Maintenance	NBK Bangor, NBK Bremerton, and Offshore Area	22	None	26	None	26	None

Table 2.5-1: Current and Proposed Training Activities (continued)

Range Activity	*Location*	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*	*No. of events [1] (annual)*	*Ordnance (Number per year)*
Other Training (continued)							
Surface Ship Sonar Maintenance	NBK Bremerton, NS Everett, and Offshore Area	13	None	25	None	25	None
Unmanned Underwater Vehicle Training	Inland Waters Offshore Area (QRS)	Not previously analyzed as a training activity [6]	None	60	None	75	None

[1] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.
[2] These events typically involve two aircraft; however, based upon the training requirement, events may involve multiple aircraft. The increase in this activity results in approximately 300 additional aircraft flights per year.
[3] The TORPEX – SUB activity was analyzed in 2010 as part of the Sinking Exercise. The Sinking Exercise is no longer conducted in the NWTT Study Area and the TORPEX – SUB activity is now a separate activity.
[4] Multiple Air Combat Maneuver and Electronic Warfare aircraft events occur during a single aircraft training flight (sortie). On average, two events occur per sortie.
[5] This activity is covered under a separate analysis (2018 Final Environmental Assessment for Naval Special Operations in Western Washington State)
[6] Unmanned underwater vehicles were analyzed in 2015 as a testing activity.
Notes: NEPM = Non-Explosive Practice Munitions, MOA = Military Operations Area, NS = Naval Station, NBK = Naval Base Kitsap, EOD = Explosive Ordnance Disposal, QRS = Quinault Range Site, HE = High Explosive, lb. = pound

Table 2.5-2: Current and Proposed Naval Sea Systems Command Testing Activities

Range Activity	*Location* [1]	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*
Anti-Submarine Warfare							
Anti-Submarine Warfare Testing	Offshore Area	13	16 NEPM torpedoes	44	8 NEPM torpedoes	44	8 NEPM torpedoes
At-Sea Sonar Testing	Offshore Area	Not previously analyzed as a testing activity	None	4	None	6	None
	Inland Waters (DBRC)		Not previously analyzed	4–6	16-24 NEPM torpedoes	8	32 NEPM torpedoes
Countermeasure Testing	Offshore Area (QRS)	14	123 NEPM torpedoes	14	12 NEPM torpedoes	14	12 NEPM torpedoes
	Inland Waters (DBRC, Keyport Range Site)	74	21 NEPM torpedoes	29	None	29	None
	Western Behm Canal, AK	4	None	1	None	1	None
Pierside-Sonar Testing	Inland Waters (NS Everett, NBK Bangor, NBK Bremerton)	67	None	88–99	None	174	None
Submarine Sonar Testing/Maintenance	Western Behm Canal, AK	3	None	1–2	None	3	None
Torpedo (Explosive) Testing	Offshore Area	3	6 explosive torpedoes 6 NEPM torpedoes	4	8 explosive torpedoes 16 NEPM torpedoes	4	8 explosive torpedoes 16 NEPM torpedoes
Torpedo (Non-explosive) Testing	Offshore Area	23	119 NEPM torpedoes	22	146 NEPM torpedoes	22	146 NEPM torpedoes
	Inland Waters (DBRC)	41	189 NEPM torpedoes	61	358 NEPM torpedoes	61	358 NEPM torpedoes

Table 2.5-2: Current and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	*Location* [1]	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*
Mine Warfare							
Mine Countermeasure and Neutralization Testing	Offshore Area	Not previously analyzed	None	2	Mine explosive–5 Mine Neutralizer–36	2	Mine explosive–5 Mine Neutralizer–36
				1	None	1	None
	Inland Waters		None	3	None	3	None
Mine Detection and Classification Testing	Offshore Area (QRS)	Not previously analyzed	None	1	None	1	None
	Inland Waters (DBRC, Keyport Range Site)	54	None	42	None	42	None
Surface Warfare							
Kinetic Energy Weapon Testing	Offshore Area	Not previously analyzed	Not previously analyzed	4	80 Kinetic energy explosive rounds 160 NEPM large-caliber projectiles	4	80 Kinetic energy explosive rounds 160 NEPM large-caliber projectiles
Unmanned Systems							
Unmanned Aerial System Testing	Offshore Area (QRS)	20	None	2	None	2	None
	Inland Waters (DBRC, Keyport Range Site, R6701)	20	None	20	None	20	None

Table 2.5-2: Current and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	*Location* [1]	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*
Unmanned Systems (continued)							
Unmanned Surface Vehicle System Testing	Offshore Area (QRS)	20	None	4	None	4	None
	Inland Waters (DBRC, Keyport Range Site)	20	None	20	None	20	None
Unmanned Underwater Vehicle Testing	Offshore Area (QRS)	28	27 NEPM torpedoes	38–39	12–24 NEPM torpedoes	39	24 NEPM torpedoes
	Inland Waters (DBRC, Keyport Range Site, Carr Inlet)	253	107 NEPM torpedoes	371–379	48–72 NEPM torpedoes	400	72 NEPM torpedoes
Vessel Evaluation							
Propulsion Testing	Offshore Area	Not previously analyzed	Not previously analyzed	8–10	None	13	None
Undersea Warfare Testing	Offshore Area	Not previously analyzed	Not previously analyzed	1–12	20–78 NEPM torpedoes	18	121 NEPM torpedoes
Vessel Signature Evaluation	Inland Waters (DBRC)	Not previously analyzed	None	1	None	1	None
	Western Behm Canal, AK	43	None	25–37	None	48	None

Table 2.5-2: Current and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	*Location* [1]	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*
Other Testing							
Acoustic and Oceanographic Research	Offshore Area (QRS)	Not previously analyzed	Not previously analyzed	1	None	1	None
	Inland Waters (DBRC, Keyport Range Site)	Not previously analyzed	Not previously analyzed	3	None	3	None
Acoustic Component Testing	Inland Waters (Indian Island, NS Everett, NBK Bangor, NBK Bremerton)	60	None	45	None	45	None
	Western Behm Canal, AK	4	None	13–18	None	18	None
Cold Water Support	Offshore Area (QRS)	20	None	0	None	0	None
	Inland Waters (Keyport Range Site, DBRC, Carr Inlet)	65	None	4	None	5	None
	Western Behm Canal, AK	1	None	1	None	1	None
Hydrodynamic and Maneuverability Testing	Western Behm Canal, AK	3	None	1	None	3	None

Table 2.5-2: Current and Proposed Naval Sea Systems Command Testing Activities (continued)

Range Activity	*Location* [1]	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*	*No. of events* [2] *(annual)*	*Ordnance (Number per year)*
Other Testing (continued)							
Non-Acoustic Component Testing	Offshore Area	6	None	7–8	None	8	None
	Inland Waters (DBRC, Keyport Range Site, NBK Bangor)	74	None	75	None	75	None
Post-Refit Sea Trial	Inland Waters (DBRC)	32	None	30	None	39	None
Radar and Other System Testing	Offshore Area	Not previously analyzed	Not previously analyzed	55	None	55	None
	Inland Waters (DBRC)			8	None	8	None
Semi-Stationary Equipment Testing	Inland Waters (DBRC, Keyport Range Site)	176	None	120	None	120	None
	Western Behm Canal, AK	2	None	2–3	None	3	None
Simulant Testing	Offshore Area	Not previously analyzed	Not previously analyzed	50	None	50	None

[1] Locations given are areas where activities typically occur. However, activities could be conducted in other locations within the Study Area.
[2] For activities where the maximum number of events varies between years, a range is provided to indicate the "representative–maximum" number of events. For activities where no variation is anticipated, only the maximum number of events within a single year is provided.
Notes: NEPM = Non-Explosive Practice Munitions, NS = Naval Station, NBK = Naval Base Kitsap, DBRC = Dabob Bay Range Complex, QRS = Quinault Range Site, EOD = Explosive Ordnance Disposal

Table 2.5-3: Current and Proposed Naval Air Systems Command Testing Activities

Range Activity	*Location*	*2015 NWTT EIS/OEIS Ongoing Activities*		*Supplemental*			
				Alternative 1 (Preferred)		*Alternative 2*	
		No. of events (annual)	*Ordnance (Number per year)*	*No. of events (annual)*	*Ordnance (Number per year)*	*No. of events (annual)*	*Ordnance (Number per year)*
Anti-Submarine Warfare							
Tracking Test – Maritime Patrol Aircraft	Offshore Area	43	None	4	None	4	None
		6	70 IEER sonobuoy				
Tracking Test – Maritime Patrol Aircraft (SUS)	Offshore Area	5	72 Impulsive SUS buoys (e.g., MK-61, MK-64, MK-82)	4	80 Impulsive SUS buoys (e.g., MK-61, MK-64, MK-82)	4	80 Impulsive SUS buoys (e.g., MK-61, MK-64, MK-82)
Electronic Warfare (EW)							
Flare Test	Offshore Area	10	600 flares	0	None	0	None
Other Testing							
Intelligence, Surveillance, Reconnaissance (ISR)/Electronic Warfare (EW) Triton Testing	Offshore Area	Not previously analyzed	None	20	None	20	None

Notes: SUS = Signal Underwater Sound, IEER = Improved Extended Echo Ranging

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