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2 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

The Proposed Action does not involve extensive changes to the Northwest Training Range Complex (NWTRC) facilities, activities, or training capacities as they currently exist. Rather, the Proposed Action would result in selectively focused but critical enhancements and increases in training that are necessary to ensure the NWTRC supports Navy training and readiness objectives.

Actions to support current, emerging, and future training and research, development, test and evaluation (RDT&E) (Unmanned Aerial Systems [UASs] only) activities at the NWTRC, including implementation of range enhancements, will be evaluated in this Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS). These actions include:

- Potential increase in the number of training activities of the types currently being conducted in the NWTRC.
- Operate air target services for locally based aircraft, surface, and submarine combatant ships with a capability to support air-to-air missile exercise (A-A MISSILEX), electronic combat (EC) Opposition Force (OPFOR) requirements, and surface-to-air (S-A) gunnery and missile exercises.
- Operate surface target services for locally based aircraft, surface combatant ships and submarines with a capability to support air-to-surface (A-S) bombing and missile exercises, surface-to-surface (S-S) gunnery and missile exercises, and EC OPFOR.
- Develop an additional land based EC threat signal emitter capability along the Washington coast for offshore use by aircraft, surface and subsurface combatants in W-237, the Olympic Military Operating Areas (MOAs), and portions of the Pacific Northwest (PACNW) Surface and Submarine Operating Areas (OPAREA).
- Development of a small scale underwater training minefield off the coast of Washington, outside the Olympic Coast National Marine Sanctuary (OCNMS).
- Potential use of a Portable Undersea Tracking Range (PUTR). Although this system can be used anywhere in the OPAREA, the PUTR would be used primarily off the Washington coast.

This chapter is divided into the following major subsections: Section 2.1 provides a detailed description of the NWTRC. Sections 2.2 through 2.5 describe the major elements of the Proposed Action and Alternatives to the Proposed Action including the No Action Alternative.

2.1 DESCRIPTION OF THE NWTRC STUDY AREA

Military activities in the NWTRC Study Area occur (1) on the ocean surface, (2) under the ocean surface, (3) in the air, and (4) on land. A summary of the land, air, sea, undersea space addressed in this EIS/OEIS is provided in Table 2-1. To aid in the description of the ranges covered in the NWTRC EIS/OEIS, the ranges are divided into two major geographic and functional subdivisions. Each of the individual ranges falls into one of these two major range subdivisions:

- The Offshore Area. The offshore areas of the Range Complex include air, surface, and subsurface operating areas extending generally west from the coastline of Washington, Oregon, and Northern California for a distance of approximately 250 nm (463 km) into international waters.
- The Inshore Area includes all air, land, sea, and undersea ranges and OPAREAs inland of the coastline and including Puget Sound. None of the Inshore Area extends into Oregon or California.

Table 2-1 provides an overview of the size of each range within these areas. Table 2-2 summarizes the major component areas of the NWTRC Offshore Area.

Table 2-1: Summary of the Air, Sea, Undersea, and Land Space

Area Name	Airspace (square nautical miles [nm^2])			Sea Space (nm^2)	Undersea Space (nm^2)	Land Range (acres)
	International Airspace	Restricted Airspace	MOA/Other			
Offshore Area	122,400[1]	NA	NA	122,400	122,400	NA
Inshore Area	NA	367	11,684	61	61	875
TOTAL	**122,400**	**367**	**11,684**	**122,461**	**122,461**	**875**

[1] International Airspace is over-water in the PACNW OPAREA and includes 33,997 nm^2 of Warning Area airspace
Source: 366 Report to Congress

Table 2-2: NWTRC Offshore Areas

Area Designation	Description
Pacific Northwest Ocean Surface/Subsurface Operating Area (PACNW OPAREA)	The Pacific Northwest Ocean Surface/Subsurface Operating Area (PACNW OPAREA) extends from the Strait of Juan de Fuca south to 40° N latitude off of Northern California, from the coast line westward to 130° West longitude.
Warning Area 237 (W-237 [A-H, J])	W-237 airspace extends westward starting 3 nautical miles (nm) (5.5 kilometers [km]) offshore from the coast of Washington State and is divided into nine areas (A-H, and J) of designated SUA (Special Use Airspace).
Warning Area 570 (W-570)	W-570 is a smaller warning area that begins approximately 12 nm (22.2 km) off the central coast of Oregon.
Warning Area 93 (W-93 [A/B])	Warning Area 93 is located approximately 12 nm (22.2 km) off the coast of Oregon and Northern California, approximately 10 nm (18.5 km) south of and similar in size to W-570.

2.1.1 Northwest Training Range Complex Offshore Area Overview

The PACNW OPAREA serves as maneuver water space for ships and submarines to conduct training and to use as transit lanes. It extends from the Strait of Juan de Fuca in the north, to approximately 50 nm (92.6 km) south of Eureka, California in the south, and from the coast line of Washington, Oregon, and California westward to 130° West longitude (Figure 2-1). The southern boundary of the OPAREA is at 40° N latitude, which corresponds to the northern boundary of Mendocino County in Northern California.

2.1.1.1 Air Space

The Special Use Airspace (SUA) in the Offshore Area is comprised of three Warning Areas that overlay portions of the PACNW OPAREA. W-237 extends westward off the coast of Northern Washington State and is divided into nine sub-areas (A-H, and J). U.S. and foreign ships, submarines, and aircraft conduct training in W-237 in Anti-Submarine Warfare (ASW), Anti-Surface Warfare (ASUW), Anti-Air Warfare (AAW), and Electronic Combat (EC).

W-570 is a smaller warning area located approximately 12 nm off the central coast of Oregon. W-570 is primarily used by United States Air Force (USAF) Western Air Defense Sector aircraft from McChord Air Force Base. P-3 aircraft from Commander, Patrol and Reconnaissance Wing TEN (CPRW-10) at Naval Air Station Whidbey Island (NASWI) occasionally use W-570 for reconnaissance training activities. Additionally, occasional training activities occur in international airspace outside of Warning Areas in accordance with international agreements on "Operations and Firings Over the High Seas."

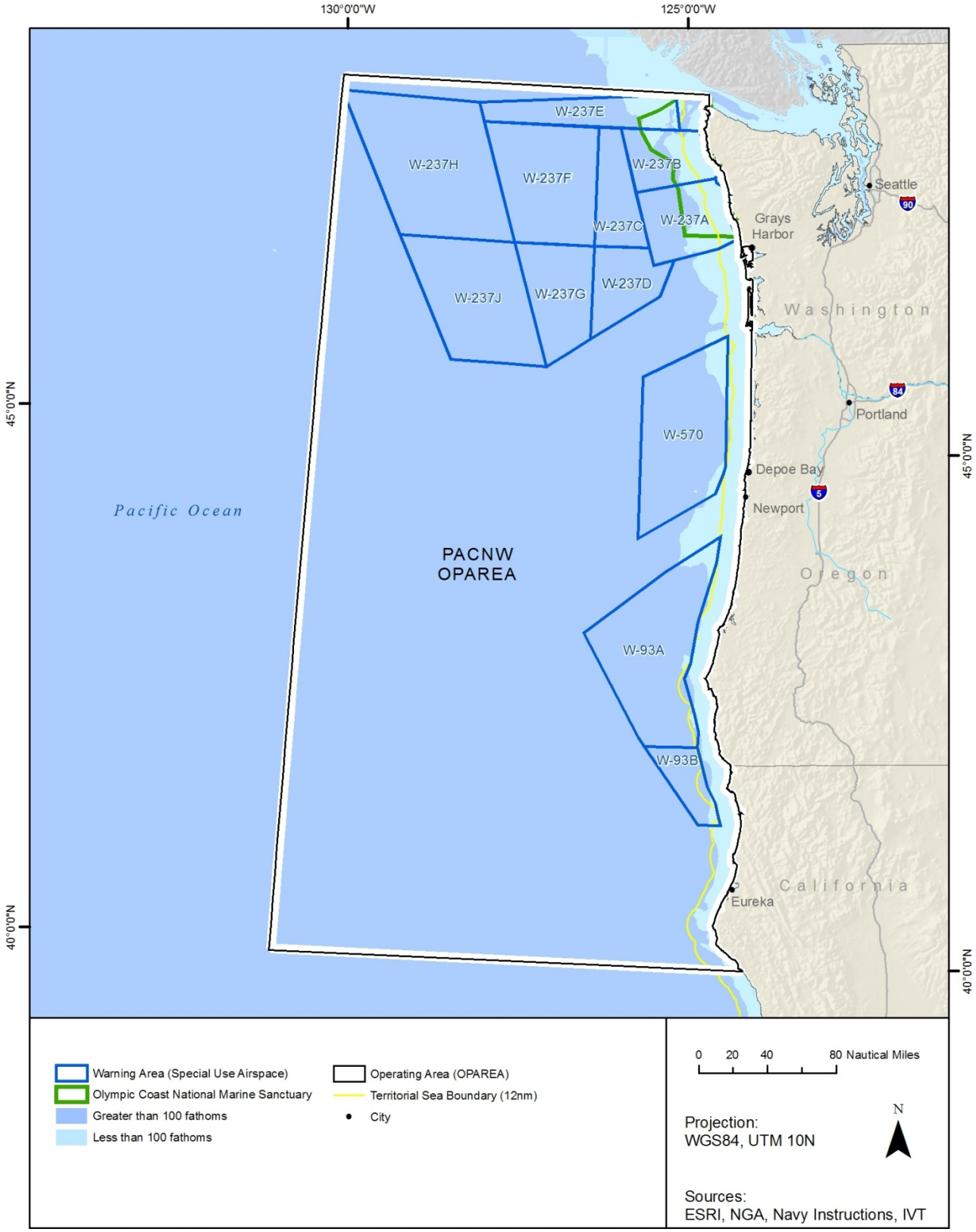


Figure 2-1: NWTRC Offshore Area

W-93 is located 12 nm off the coast of Oregon and northern California, approximately 10 nm south of and similar in size to W-570. It is primarily used by Oregon Air National Guard aircraft; however, W-93 is also used occasionally by CPRW-10 P-3 aircraft for reconnaissance training. USAF and Air National Guard aircraft activities conducted in W-570 and W-93 are not part of the proposed action and are not considered in this EIS/OEIS.

2.1.1.2 Sea Space

The PACNW OPAREA is approximately 510 nm (945 km) in length from the northern boundary at the Strait of Juan de Fuca to the southern boundary at 40° N latitude, and 250 nm (463 km) from the coastline to the western boundary at 130° W longitude. The southern boundary of 40° N latitude corresponds to the northern boundary of Mendocino County in Northern California. Total surface area of the PACNW OPAREA is 122,400 nm^2 (420,163 km^2). Although this area extends to the coastline of Washington, Oregon, and Northern California, no training that involves live explosives is conducted within 3 nm of shore. Historically, as well as projected for the future, training within 12 nm seldom if ever occurs off the coast of Oregon and Northern California.

Commander Submarine Force, U.S. Pacific Fleet (COMSUBPAC) Pearl Harbor manages this water space as transit lanes for U.S. submarines. While the sea space is ample for all levels of Navy training, no infrastructure is in place to support training. For example, there are no dedicated training frequencies, no permanent instrumentation, no meteorological and oceanographic operations (METOC) system, and no OPFOR or EC target systems. In this region of the Pacific Ocean, storms and high sea states can create challenges to surface ship training between October and April. In addition, strong undersea currents in the Pacific Northwest make it difficult to place bottom-mounted instrumentation such as hydrophones.

2.1.1.3 Undersea Space

The Offshore Area undersea space lies beneath the PACNW OPAREA as described above. The bathymetry chart depicts a 100 fathom curve parallel to the coastline approximately 12 nm (22.2 km) to sea, and in places 20 nm (37 km) out to sea. The area of deeper water of more than 100 fathoms (600 ft) is calculated to be approximately 115,800 nm^2 (397,183 km^2), while the shallow water area of less than 100 fathoms (600 ft) is all near shore and amounts to approximately 6,600 nm^2 (22,637 km^2). Figure 2-1 depicts the 100 fathom curve.

2.1.2 NWTRC Inshore Area Overview

Inshore Areas (see Figures 2-2 and 2-3) include MOAs and associated Air Traffic Control Assigned Airspace (ATCAA) which superimposes the MOAs, air and surface/subsurface Restricted Areas, the Darrington Area, Explosive Ordnance Disposal (EOD) Ranges and Outlying Landing Field (OLF) Coupeville. Naval Special Warfare (NSW) forces have no dedicated ranges in the NWTRC, but train in Puget Sound waters and conduct on-land training at several Navy-owned locations. NSW land training typically occurs at Indian Island, and occasionally at the Seaplane Base survival area and OLF Coupeville. Refer to Section 2.3.1.6 for a description of NSW activities. Table 2-3 summarizes the NWTRC inshore areas.

MOAs are SUA of defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain non-hazardous military activities from instrument flight rules (IFR) traffic in controlled airspace and to identify for visual flight rules (VFR) traffic where these activities are conducted. Four MOAs provide military aircraft maneuver space for training. They are the Olympic, Chinook, Okanogan, and Roosevelt MOAs. The ATCAAs associated with the MOAs include the Olympic, Okanogan/Molson, and Roosevelt/Republic ATCAA. There is no ATCAA associated with the Chinook MOAs.

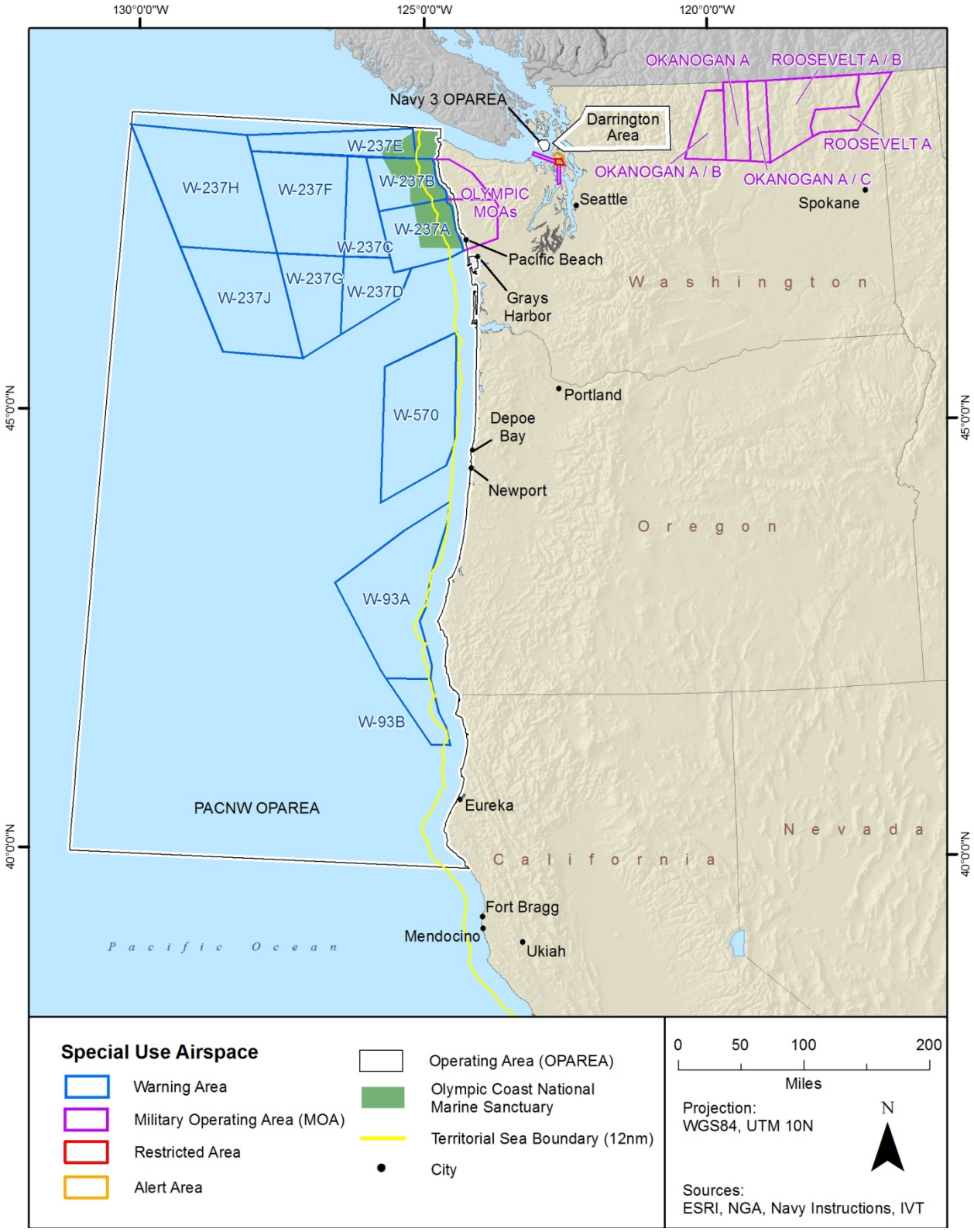


Figure 2-2: NWTRC Proposed Action Area, Including Inshore Area

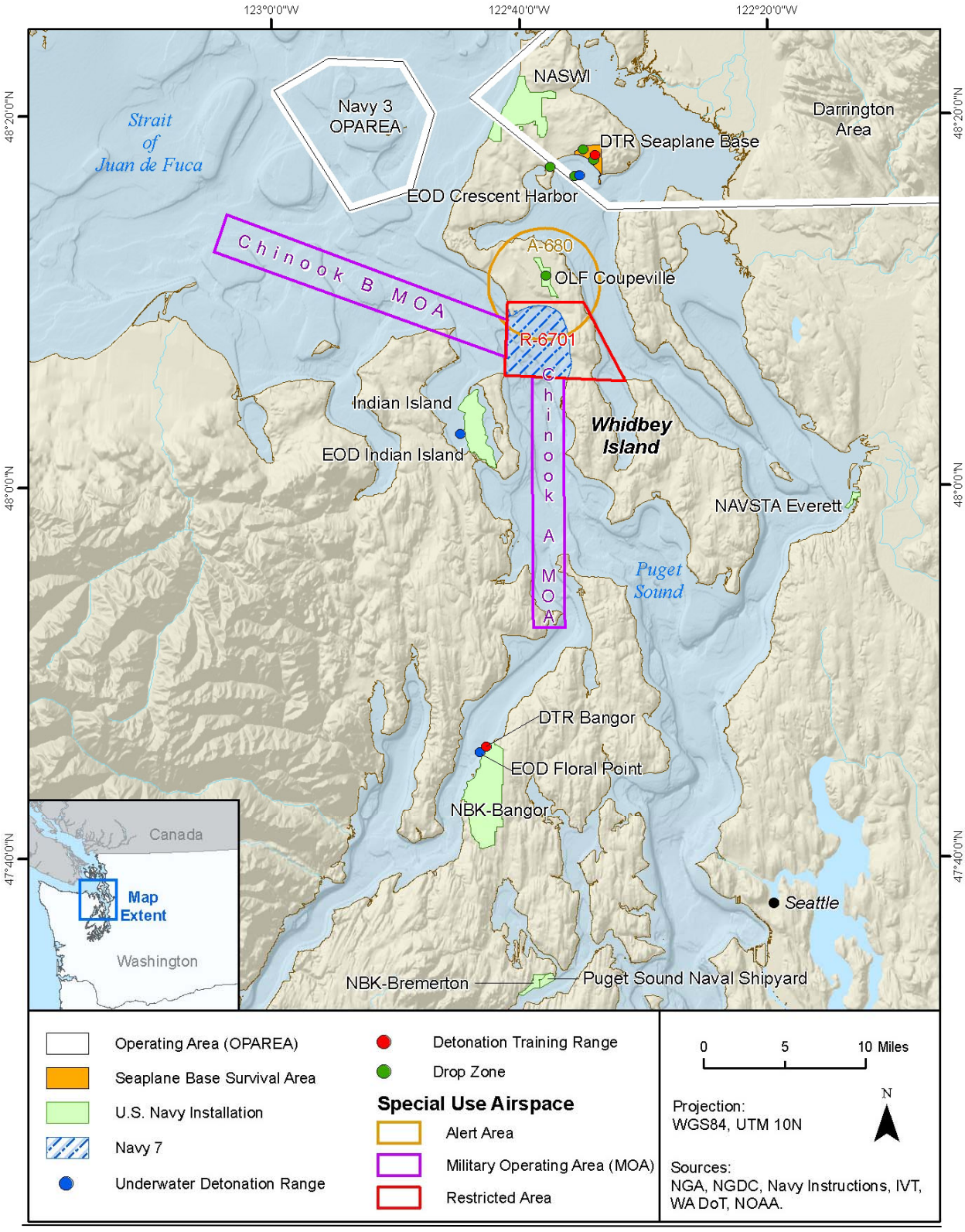


Figure 2-3: NWTRC Inshore Area (Puget Sound)

Table 2-3: NWTRC Inshore Areas

Area Designation	Description
Olympic MOA (A/B) Olympic ATCAA (A/B)	Olympic MOA is located over the Olympic Peninsula, along the Washington State coast. The MOA lower limit is 6,000 ft above mean sea level (MSL) but not below 1200 feet above ground level (AGL), and the upper limit is flight level (FL) 180, with a total area coverage of 1,614 nm^2 (5,536 km^2). The ATCAA starts at FL180 with an upper limit of FL500. (See Figure 2-2)
Chinook MOA (A/B)	The Chinook MOAs are both located over water west of Whidbey Island. The two small air corridors, A and B, are each 2nm wide (3.7 km) and extend from 300 feet above the surface to 5,000 feet MSL. They are used for aircraft ingress and egress for the Admiralty Bay Range (R-6701/Navy 7). (See Figure 2-3)
Okanogan MOA (A/B/C) Okanogan/Molson ATCAA	Okanogan MOA is located in north-central Washington near the U.S.-Canadian border. MOA parts B &C have lower limits of 300 feet AGL and an upper limit of 9,000 feet MSL. MOA part A has a lower limit of 9,000 feet MSL up to but not including FL180. The Okanogan and Molson ATCAAs start at FL180 and the upper limit is FL500; with a total area coverage of 4,339 nm^2 (14,882 km^2). (See Figure 2-2)
Roosevelt MOA (A/B) Roosevelt/Republic ATCAA	Roosevelt MOA is located in north-central Washington near the U.S.-Canadian border. Approximately 60 nm^2 of the MOA extends into the northeast corner of Idaho. The lower limit of segment A is 9,000 ft MSL and the lower limit of segment B is 300 ft AGL. The upper limit of segment A is FL 180 and the upper limit of segment B is 9,000 ft MSL. The Roosevelt and Republic ATCAAs start at FL180 with an upper limit of FL500. The total area coverage is 5,319 nm^2 (18,244 km^2). (See Figure 2-2)
Darrington Area	Darrington Area is a block of airspace used for electronic countermeasures training and functional check flight missions. This area is not a designated MOA (although it is used like a MOA) and is used by NASWI based units only (EA6, EP3, and P3). The lower limit is 10,000 ft MSL and the upper limit is FL 230 (higher altitude is available upon request) with a total area of 2,131 nm^2 (7,309 km^2).(See Figure 2-2 and 2-3)
R-6701 (Admiralty Bay) Navy 7 OPAREA	R-6701 (Admiralty Bay) is a Restricted Area over Admiralty Bay, WA with a lower limit at the ocean surface and an upper limit of 5,000 ft MSL. Navy 7 OPAREA is the surface and subsurface restricted area that underlies R-6701. They cover a total area of 56 nm^2 (192 km^2). (See Figure 2-3)
Navy 3 OPAREA	Navy 3 OPAREA is a surface and subsurface restricted area off the west coast of northern Whidbey Island. (See Figure 2-3)
A-680 (OLF Coupeville)	A-680 is a 3 nm (5.5 km) circle centered on OLF Coupeville located 15 nm (27.8 km) south of NASWI. (See Figure 2-3)
Seaplane Base Survival Area	The Seaplane Base Survival Area includes forest, grassland, and beach area at Navy Seaplane Base/Crescent Harbor, NASWI. This area includes the DTR Seaplane Base (See Figure 2-3).
EOD Crescent Harbor	Water range located in Crescent Harbor.
EOD Floral Point	Floral Point Underwater EOD Range, located in Hood Canal, near NBK-Bangor, is active but seldom used.
EOD Indian Island	Indian Island Underwater EOD Range, located adjacent to Indian Island, is active but seldom used.
DTR Bangor	The DTR at Bangor is used for small detonations on land at NBK-Bangor.
OLF Coupeville	OLF Coupeville is a single runway airfield with ample surrounding open space for a variety of training activities including helicopter insertion/extraction and parachute training.

The Darrington Area, while not a designated MOA, is a block of airspace established by Letter of Agreement with Seattle Air Route Traffic Control Center for EC training and other non-live firing missions. The R-6701 is airspace located over central Whidbey Island, restricted for military use. Navy 7

is a sea surface and subsurface area beneath R-6701. Navy 3 is a surface and subsurface restricted area off the west coast of northern Whidbey Island. Restricted airspace, such as that in R-6701, is SUA designated under 14 CFR Part 73 within which the flight of aircraft, while not wholly prohibited, is subject to restriction. The specific limits and regulations of restricted surface areas such as Navy 3 and Navy 7 are included in the appropriate U.S. Coast Pilot. Training activities in the Puget Sound involving the use of mid-frequency active sonar are not proposed in this EIS/OEIS. Any request to use MFA sonar for training in Puget Sound must be approved by Commander, Pacific Fleet.

OLF Coupeville is used primarily for Field Carrier Landing Practice (FCLP) for EA-6Bs from NASWI, but is also used as a Drop Zone (DZ) for parachute training, Landing Zone (LZ) for helicopter training, and for small unit ground training events as well. An alert area (A-680) establishes a 3-nm (5.5-km) radius alert area around the OLF. An alert area is SUA wherein a high volume of pilot training activities or an unusual type of aerial activity is conducted, neither of which is hazardous to aircraft. Nonparticipating pilots are advised to be particularly alert when flying in these areas. Table 2-4 summarizes the airspace attributes of the inshore areas.

Table 2-4: Inshore Area Airspace Summary

Airspace	nm²	Lower limit	Upper limit	Over Land?	Controlling/ Scheduling Authority
Inshore					
A-680 (OLF Coupeville)	28	Surface	3,000 ft MSL	Yes	NASWI
Admiralty Bay Mining Range R-6701	22	Surface	5,000ft MSL	No	NASWI
Chinook MOA (A,B) SUA corridors for R-6701	56	300ft MSL			
Olympic MOA (A,B)	1,614	6000ft MSL	FL180	Yes	NASWI
Olympic ATCAA		FL180	FL500		
Darrington Area	2,131	10,000ft MSL	FL230, higher alt avail on request	Yes	NASWI
Okanogan MOA (A,B,C)	4,339	A: 9000ft MSL B: 300ft AGL C: 300ft AGL	A: FL180 B: 9000ft MSL C: 9000ft MSL	Yes	NASWI
Okanogan ATCAA		FL180	Up to but not including FL240		
Molson ATCAA		FL240	FL500		
Roosevelt MOA (A,B)	5,319	A: 9000ft MSL B: 300ft AGL	A: FL180 B: 9,000ft MSL	Yes	NASWI
Roosevelt ATCAA		FL180	Up to but not including FL240		
Republic ATCAA		FL240	FL500		
TOTAL	**13,509**				

Source: 366 Report to Congress, AP-1A Flight Information Publication

Three EOD units are currently located in the NWTRC, all in the Inshore Area: Headquarters element, EOD Mobile Unit Eleven (HQ EODMU-11), EODMU-11 Detachment (Det.) Naval Base Kitsap-Bangor (NBK-Bangor) and EODMU-11 Det. Whidbey Island. EODMU-11 Det. Whidbey Island is based at the Seaplane Base, NASWI and conducts most of their underwater detonations in adjacent Crescent Harbor

Underwater EOD Range (referred to as EOD Crescent Harbor), and occasionally uses the Indian Island Underwater EOD Range (EOD Indian Island). The EODMU-11 Detachment is expected to relocate out of the area in 2010. See Section 2.5.2.3 for additional information concerning this relocation of forces. Although still open as a training site, EOD Indian Island, adjacent to Indian Island, is seldom used for underwater detonations. EODMU 11 Det. NBK-Bangor conducts much of their non-explosive training in Hood Canal, Dabob Bay at the Floral Point Underwater EOD Range (EOD Floral Point). Most ground training events are conducted in the Survival Area and the upland Demolition Training Range (DTR) located there (DTR Seaplane Base). EOD units also conduct parachute training at a DZ at OLF Coupeville, at a DZ in Crescent Harbor, and occasionally at other DZs in the area. EODMU 11 Det. NBK-Bangor conducts land demolition training at the Bangor EOD DTR. Figure 2-3 depicts the EOD Ranges.

2.2 NAVY SONAR SYSTEMS

Navy sonar training is a significant piece of overall Navy training. Recently, sonar and its potential impacts to the marine environment have become a controversial issue. This section is designed to better inform the reader about: a) What sonar is, b) Why the Navy trains with sonar, and c) Sonars used in the NWTRC. The analysis of impacts of sonar to the marine environment is conducted in Chapter 3 of this EIS/OEIS.

2.2.1 What is Sonar?

Sonar, which stands for "**SO**und **N**avigation **A**nd **R**anging," is a tool that uses underwater acoustics to navigate, communicate, or detect other underwater objects. There are two basic types of sonar: active and passive.

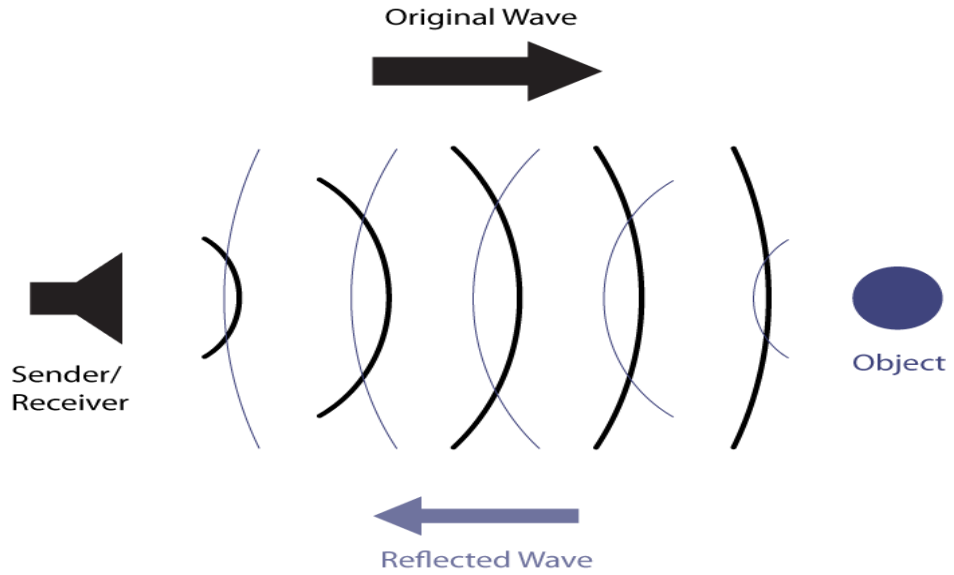
- **Active sonar** emits pulses of sound waves that travel through the water, reflect off objects, and return to the receiver on the ship. By knowing the speed of sound in water and the time for the sound wave to travel to the target and back, we can quickly calculate distance between the ship and the underwater object. As examples, active sonar systems can be used to track targets and realign internal navigation systems by identifying known ocean floor features. Some whales, dolphins, and bats use the same technique, echolocation, for identifying their surroundings and locating prey.
- **Passive sonar** is a listening device that uses hydrophones (underwater microphones) that receive, amplify, and process underwater sounds. Passive sonar is used primarily to detect the presence of submarines. The advantage of passive sonar is that is places no sound in the water, and thus does not reveal the location of the listening vessel. Passive sonar can indicate the presence, character, and direction of submarines. Passive sonar is not considered within this analysis for potential acoustic impacts.

Underwater sounds in general and sonar specifically can be categorized by their frequency. For the analysis in this EIS/OEIS, sonar falls into one of three frequency ranges: low-frequency, mid-frequency, and high-frequency.

- **Low-frequency** sonar is sonar that emits sounds in the lower frequency range, less than 1 kilohertz (kHz). Low-frequency sonar is useful for detecting objects at great distances, as low-frequency sound does not dissipate as rapidly as higher frequency sounds.
- **Mid-frequency** sonar uses sound in the frequency spectrum between 1 and 10 kHz. With a typical range of up to 10 nm, mid-frequency sonar is the Navy's primary tool for detecting and identifying submarines. Sonar in this frequency range provides a valuable combination of range and target resolution (accuracy).

- **High-frequency** sonar uses frequencies greater than 10 kHz. Although high-frequency sonar dissipates rapidly, giving it a shorter effective range, it provides higher resolution and is useful at detecting and identifying smaller objects such as sea mines.

Modern sonar technology includes a multitude of sonar sensor and processing systems. In concept, the simplest active sonar emits sound waves, or "pings," sent out in multiple directions (i.e., is omnidirectional). Sound waves reflect off the target object and move in multiple directions (Figure 2-4). The time it takes for some of these sound waves to return to the sonar source is calculated to provide a variety of information, including the distance to the target object. More sophisticated active sonars emit an omnidirectional ping and then rapidly scan a steered receiving beam to provide directional as well as range information. Even more advanced sonars use multiple pre-formed beams to listen to echoes from several directions simultaneously and provide efficient detection of both direction and range. For more information about sonar or sound in the sea, go to http://www.dosits.org.



Source: ManTech SRS, 2008

Figure 2-4: Principle of an Active Sonar

2.2.2 Why The Navy Trains With Sonar

Sea control is the foundation for the United States' global power projection. If the United States cannot command the seas and airspace above them, it cannot project power to command or influence events ashore and cannot shape the security environment. For the last century, submarines have been the weapon of choice for countries intending on contesting another nation's control of the seas. Today, there are more than 300 modern, quiet diesel submarines around the world, operated by more than 40 nations, including Iran and North Korea. The United States cannot in good conscience ask its Sailors and Marines to serve on ships at sea without the ability to defend themselves against this threat. The key to maintaining the Navy's ability to defend against adversary submarines is a comprehensive "at-sea" training regime to prepare U.S. Sailors for this contingency. This training requires the use of active sonar. The skills developed during this training are perishable and require periodic refreshing, which can't be regenerated easily. If training is not as realistic as possible, the Navy will quickly lose its edge in this critical dimension of the battlefield.

Submarines have been and are likely to remain the weapon system with the highest leverage in the maritime domain. The ability to locate and track a submarine is a mission skill that must be possessed by every ASW-capable ship, submarine, and aircraft.

There are three fundamental truths about ASW. First, it is critically important to our strategies of sea control, power projection, and direct support to land operations.

Second, ASW requires a highly competent team of air, surface and sub-surface platforms to be effective in a complex and a highly variable three-dimensional environment. Each asset has unique strengths that contribute to the full spectrum of undersea, surface, airborne, and space-based ASW systems. The undersea environment – ranging from the shallows of the littoral to the vast depths of the great ocean basins and polar regions under ice – demand a multi-disciplinary approach: reliable intelligence; oceanography; and surveillance and cueing of multiple sensors, platforms and undersea weapons. Most importantly, it takes highly skilled, trained, and motivated people.

Finally, ASW is extremely difficult. As an example, during the 1982 Falklands conflict, the Argentine submarine SAN LUIS operated in the vicinity of the British task force for more than a month and was a constant concern to Royal Navy commanders. Despite the deployment of five nuclear attack submarines, 24-hour per day airborne ASW operations, and expenditures of precious time, energy, and ordnance, the British never once detected the Argentine submarine. Today, this complex and challenging mission taxes naval forces to their very limits. The U.S. Navy must continue to improve or its performance compared to other world powers will most certainly decline.

As modern submarines have become significantly quieter, passive sonar is not effective enough in tracking and prosecuting all enemy submarines. Mid-frequency active sonar has become a necessary piece of the Navy's ASW program. Without mid-frequency active sonar, the U.S. Navy would be severely limited in its ability to counter the threat posed by modern, quiet submarines. Training with mid-frequency active sonar is, therefore, critical to national security.

ASW remains the linchpin of sea control. With the proliferation of modern, quiet submarines and the expansion of the Navy mission to both littoral and deep waters, the ASW challenge has become more severe. To counter the adversarial submarine challenges, the Navy's best course of action is to conduct extensive training including the use of active sonar that mirrors the intricate operating environment that would be present in hostile waters.

2.2.3 Sonars Used in the NWTRC

For the purposes of this EIS/OEIS, the term sonar refers to a system, either passive or active, used to locate underwater objects. In addition to those systems commonly referred to as sonar, there are other acoustic sources used by the Navy in the NWTRC. For example, the MK-84 tracking pinger and the PUTR uplink transmitter both are sources of underwater sound. Although not technically sonars, they do create sound and are considered in this analysis as acoustic systems. Tables 2-5 and 2-6 list typical U.S. Navy mid-frequency and high-frequency acoustic systems and identify those used during training activities conducted in the NWTRC. All sources used in the NWTRC were analyzed for potential impacts to the marine environment.

Certain systems, because of their frequent use or high power output, were quantitatively modeled for their acoustic impacts. The acoustic systems presented in Table 2-5 have been quantitatively modeled. Table 2-6 lists the systems that have been qualitatively analyzed, but not quantitatively modeled. The systems that were not modeled included systems that are typically operated at frequencies greater than 200 kHz. Because its use is not part of the Proposed Action, low-frequency sonar was not analyzed in this EIS/OEIS.

Table 2-5: Acoustic Systems Quantitatively Analyzed

Systems Quantitatively Modeled				
System	***Frequency***	***Associated Platform***	***System Use/Description***	***Used in NWTRC?***
AN/SQS-53C	MF	Surface ship sonar (DDG)	120 pings per hour	Yes
AN/SQS-56C	MF	Surface ship sonar (FFG)	120 pings per hour	Yes
AN/SSQ-62 Sonobuoy	MF	Helicopter and MPA deployed	12 pings, 30 seconds between pings	Yes
AN/SSQ-110A Explosive source sonobuoy	Impulsive	MPA deployed	Contains two 5-lb charges	Yes
AN/SSQ-125	MF	MPA deployed	Same as AN/SSQ-62	Yes
MK-48 Torpedo	HF	Submarine fired torpedo	15 min per torpedo run	Yes
AN/BQS-15	HF	Submarine	Submarine mine detection sonar	Yes
MK-84 Range Tracking Pinger	HF	Used on Portable Undersea Tracking Range	PUTR target tracking	Yes
PUTR Uplink Transmitter	MF/HF	Component of the Portable Undersea Tracking Range	PUTR tracking uplink signal	Yes

DDG – Guided Missile Destroyer; FFG – Fast Frigate; HF – High-Frequency; MF – Mid-Frequency; MPA – Maritime Patrol Aircraft

Table 2-6: Acoustic Systems Not Quantitatively Analyzed

Systems Not Quantitatively Modeled				
System	***Frequency***	***Reason Not Modeled***	***System Use/Description***	***Used in NWTRC?***
AN/AQS-13 or AN/AQS-22	MF	Not used in NWTRC	Helicopter dipping sonar	No
AN/SQQ-32	HF	Not used in NWTRC	MCM over the side system	No
MK-46 Torpedo	HF	Not used in NWTRC	Surface ship and aircraft fired exercise torpedo	No
AN/SLQ-25 (NIXIE)	MF	Not used in NWTRC	Ship towed array	No
AN/SQS-53/56 (Kingfisher)	MF	Not used in NWTRC	Hull-mounted sonar (small object detection)	No
AN/BQQ-10	MF	Not used in NWTRC	Submarine hull-mounted sonar	No
ADC MK-3 and MK-2	MF	Not used in NWTRC	Submarine fired countermeasure	No
Surface Ship and Submarine Fathometer	12 kHz	Not unique to military, operates identical to commercially available bottom sounder	Depth finder on surface ships and submarines	Yes
SQR-19	Passive	System is a passive towed array emitting no active sonar	A listening device towed behind a surface ship	Yes
TB-16/23/29/33	Passive	System is a passive towed array emitting no active sonar	A listening device towed behind a submarine	Yes
AN/SSQ-53 DIFAR Sonobuoy	Passive	Sonobuoy is passive and emits no active sonar	Passive listening sonobuoys deployed from aircraft	Yes
AN/AQS-14/20/24	>180 kHz	System frequency outside the upper limit for marine mammals	Helicopter towed array used in MIW for the detection of mines	No

ADC – Acoustic Device Countermeasure; AEER – Advanced Extended Echo Ranging; DIFAR – Directional Frequency Analysis and Recording; kHz – Kilohertz; MCM Mine Countermeasures; MIW – Mine Warfare; MPA – Maritime Patrol Aircraft

It is important to note that, as a group, marine mammals have functional hearing ranging from 10 hertz (Hz) to 180 kHz; however, their best hearing sensitivities are well below 180 kHz. Since active sonar sources operating at 180 kHz or higher dissipate rapidly and are at or outside the upper frequency limit of even the ultrasonic species of marine mammals, further consideration and modeling of these higher frequency acoustic sources are not warranted. As such, high-frequency active sonar systems in excess of 180 kHz are not analyzed in this EIS/OEIS.

2.3 PROPOSED ACTION AND ALTERNATIVES

2.3.1 Alternatives Development

NEPA implementing regulations provide guidance on the consideration of alternatives in an EIS. These regulations require the decision maker to consider the environmental effects of the Proposed Action and a range of alternatives to the Proposed Action (40 C.F.R. § 1502.14). The range of alternatives includes reasonable alternatives, which must be rigorously and objectively explored, as well as other alternatives that are eliminated from detailed study. To be "reasonable," an alternative must meet the stated purpose of and need for the Proposed Action.

The purpose of including a No Action Alternative in environmental impact analyses is to ensure that agencies compare the potential impacts of the proposed major Federal action to the known impacts of maintaining the status quo.

With regard to the No Action Alternative, it currently exists in the EIS/OEIS as a baseline, where the action presented represents a regular and historical level of activity on the NWTRC to support this type of training and exercises. In other words, the EIS/OEIS baseline, or No Action Alternative, represents no change from current levels of training usage. The potential impacts of the current level of training and RDT&E activity on the NWTRC (defined by the No Action Alternative) are compared to the potential impacts of activities proposed under Alternative 1 and Alternative 2.

Alternatives considered in this EIS/OEIS were developed by the Navy after careful assessment by subject-matter experts, including units and commands that utilize the ranges, range management professionals, and Navy environmental managers and scientists. The Navy has developed a set of criteria for use in assessing whether a possible alternative meets the purpose of and need for the Proposed Action. Each of these criteria assumes implementation of mitigation measures for the protection of natural resources as appropriate. Any alternative considered for future analysis should support or employ:

1. All requirements of the Fleet Response Training Plan[1] (FRTP) as they apply to training conducted in the NWTRC;
2. Achievement of training tempo requirements based on Fleet deployment schedules;
3. Joint training events;
4. Basic and intermediate training of Navy forces across all applicable Navy Primary Mission Areas (PMARs);
5. Training requirements of formal military schools located at Navy installations throughout the Northwest Pacific region;
6. Navy RDT&E activities associated with unmanned aerial systems (UASs);
7. Allied military training activities;

[1] Predeployment training is governed by the FRTP. The FRTP establishes a training cycle that includes four phases: (1) maintenance; (2) unit-level training; (3) integrated training; and (4) sustainment.

8. Alignment of the NWTRC infrastructure with Naval Force structure, including training with new weapons, systems, and platforms (vessels and aircraft) as they are introduced into the Fleet;
9. Sustainable range management practices that protect and conserve natural and cultural resources; and
10. Preservation of access to training areas for current and future training requirements, while addressing potential encroachments that threaten to impact range capabilities.

NEPA regulations require that the Federal action proponent study means to mitigate adverse environmental impacts by virtue of going forward with the proposed action or an alternative (40 C.F.R. § 1502.16). Additionally, an EIS is to include study of appropriate mitigation measures not already included in the proposed action or alternatives (40 C.F.R. § 1502.14 [h]). Each of the alternatives, including the Proposed Action considered in this EIS/OEIS, includes mitigation measures intended to reduce the environmental effects of Navy activities. Mitigation measures, such as current requirements and practices are discussed throughout this EIS/OEIS.

2.3.2 Alternatives Eliminated from Further Consideration

2.3.2.1 Alternative Range Complex Locations

The NWTRC is a unique national range asset that derives its primary value from its diverse and extensive training capabilities and its location close to the Fleet concentration area in the Puget Sound. There are over 23 military shore commands, 21 aviation squadrons, and 21 ships based around the Puget Sound that depend on the NWTRC and associated offshore areas as a "backyard" range for meeting basic and intermediate training requirements in order to achieve readiness prior to deployment. In the Pacific, only two other Navy Range Complexes provide similar or greater range capabilities; the Southern California (SOCAL) Range Complex and the Hawaii Range Complex (HRC). Both are unsuitable to meet the daily training requirements of PACNW forces due to transit times to these Range Complexes. SOCAL, the nearer of the two, is over 1000 nm, or about 3 sailing days from the NWTRC. Factors that make the NWTRC uniquely suited to its mission are discussed in Section 1.2.3. These attributes include:

- Proximity to the homeport of units in the Pacific Northwest. The NWTRC serves as a backyard range for those units homeported in the Pacific Northwest area including those aviation, surface ship, submarine, and EOD forces homeported at NASWI, Naval Station Everett, NBK-Bremerton, NBK-Bangor, and Puget Sound Naval Shipyard.
- Proximity to military families. By having training areas as close to homeports as possible, it minimizes the time that Sailors have to spend away from their families, improves morale, and improves retention of personnel.
- Offers training across the spectrum of naval missions. The radio frequency spectrum is relatively unencumbered, which allows more realistic EC training for P-3, EP-3, and EA-6B aircraft. The EC mission is further enabled by the presence of an electronic signal threat simulator and increased opportunities for realistic surface to air missile defense training.
- Inland waterways of the Range Complex that provide an ideal littoral training environment. This training takes place in a variety of warfare areas for ships and submarines as they transit to and from their home ports.
- Cold water operating areas for certain aspects of NSW training. The protected waters of Puget Sound provide this environment throughout the year. Although there are no locally based NSW units in the Range Complex, SEALs from out of the area train here regularly due to the area's unique qualities.
- Large amounts of airspace and surface/subsurface range area within the complex boundaries. The abundance of special use airspace within the complex provides both over-water and over-land training opportunities for the local P-3 and EA-6B aircraft. The PACNW OPAREA is the second

largest of the Navy's ocean operating areas. It provides ample space for large scale naval exercises, and opportunities for joint and allied training.

The location of the NWTRC and its supporting operational environments allow readiness training to be conducted to properly build skills required for deploying naval forces and developing systems for their use. The NWTRC is the only northwestern United States Range Complex capable of supporting Navy readiness training. For this reason, alternative Navy range sites do not meet the purpose and need of the proposal, and therefore were eliminated from further study and analysis.

2.3.2.2 Simulated Training

Navy training includes extensive use of computer-simulated virtual training environments, and involves command and control exercises without operational forces (constructive training) where possible. These training methods have substantial value in achieving limited training objectives. Computer technologies provide excellent tools for implementing a successful, integrated training program while reducing the risk and expense typically associated with live military training. However, virtual and constructive training are an adjunct to, not a substitute for, live training, including live-fire training. Unlike live training, simulated training does not provide the requisite level of realism necessary to attain combat readiness, and cannot replicate the high-stress environment encountered during combat operations.

Aviation simulation has provided valuable training for aircrews in specific limited training situations. However, the numerous variables that affect the outcome of any given training flight cannot be simulated with a high degree of fidelity. Landing practice and in-flight refueling are two examples of flight training missions that aircraft simulators cannot effectively replicate.

The Navy continues to research new ways to provide realistic training through simulation, but there are limits to realism that simulation can provide, most notably in dynamic multi-threat environments involving numerous forces, and where the training media is too complex to accurately model, such as sound behavior in the ocean.

Although sound behavior in water can be modeled for general results, ASW training simulation requires a degree of fidelity that exceeds current technology. In ASW training, this reality limits the usefulness of both active and passive sonar simulation. Initial training of sonar technicians can and does take place using simulators, but at some point a simulator cannot match the dynamic nature of the environment, either in bathymetry, sound propagation properties, or oceanography. Specifically, coordinated unit level and Strike Group Training activities require multiple crews to interact in a variety of acoustic environments that cannot be simulated.

Sonar operators and crews must train regularly and frequently to develop the skills necessary to master the process of identifying underwater threats in the complex underwater environment. They cannot reliably simulate this training through current computer technology because the actual marine environment is too complex. Sole reliance on simulation would deny Navy strike groups the training benefit and opportunity to derive critical lessons learned in the employment of active sonar in the following specific areas:

- Bottom bounce and other environmental conditions;
- Mutual sonar interference;
- Interplay between ship and submarine target; and
- Interplay between ASW teams in the strike group.

Currently, these factors cannot be adequately simulated to provide the fidelity and level of training necessary in the employment of active sonar. Further, like any combat skill, employment of active sonar

is a perishable skill that must be exercised – in a realistic and integrated manner - in order to maintain proficiency. Eliminating the use of active sonar during the training cycle would cause ASW skills to atrophy and thus put U.S. Navy forces at risk during real world operations.

While classroom training and computer simulations are valuable methods for basic, operator-level sonar training, they are no substitute for real-time, at-sea training which mimics the conditions the U.S. Navy and its allies would encounter in actual operating environments. The use of active sonar is especially important when sonar technicians begin learning the mechanics of sonar use, but is also critical for maintaining and improving proficiency throughout their career.

This alternative—substitution of simulation for live training—fails to meet the purpose of and need for the Proposed Action and was therefore eliminated from detailed study.

2.3.2.3 Reduction in the Level of Current Training in the Northwest Training Range Complex

The Navy's requirements for training have been developed through many years of iteration to ensure Sailors and Marines achieve levels of readiness to ensure they are prepared to properly respond to the many contingencies that may occur during an actual mission. These training requirements are designed to provide the experience and proficiency needed to ensure Sailors are properly prepared for operational success. The Navy has identified training requirements to acquire war fighting proficiency. There is no "extra" training built in to the Navy training program. Any reduction of training would not allow the Navy to achieve satisfactory levels of proficiency and readiness required to accomplish assigned missions. For this reason, alternatives that would reduce training would not meet the purpose and need of the proposal, and therefore were eliminated from further study and analysis.

2.3.3 Proposed Action and Alternatives Considered

Three alternatives are analyzed in this EIS/OEIS: 1) The No Action Alternative (NAA) – Current Activities; 2) Alternative 1 – Increase Training Activities and Accommodate Force Structure Changes; and 3) Alternative 2 – Increase Training Activities, Accommodate Force Structure Changes, and Implement Range Enhancements.

As noted in Section 1.4, the purpose of the Proposed Action is to achieve and maintain Fleet readiness using the NWTRC to support current and future training activities. The proposed naval activities would continue for an indefinite period of time but this EIS/OEIS will be reviewed every five years for substantive changes and permits will be updated/renewed from regulatory agencies as necessary. The Navy proposes to:

1) Conduct training and RDT&E (UASs only) activities of the same types, and at the same levels of training intensity as currently conducted, without change in the nature or scope of military activities in the EIS/OEIS Study Area;
2) Increase training activities from current levels as necessary in support of the FRTP;
3) Accommodate force structure changes (new platforms and weapons systems); and
4) Implement range enhancements associated with the NWTRC.

The components that make up the Proposed Action are discussed in the following sections.

2.4 NO ACTION – CURRENT TRAINING ACTIVITIES WITHIN THE NWTRC

The Navy has been operating in the NWTRC since before World War II. Under the NAA, training activities and major range events would continue at current levels. The Naval training activities currently conducted in the NWTRC, presented as the NAA, have been ongoing at present levels and frequencies for approximately 10 years. Under the NAA, the NWTRC would not accommodate an increase in training

activities required to execute the FRTP or implement proposed force structure changes, nor would it implement range enhancements as necessary by the Navy. Evaluation of the No Action Alternative in this EIS/OEIS provides a baseline for assessing environmental impacts of Alternative 1 and Alternative 2 (Preferred Alternative), as described in the following subsections.

Training activities currently conducted in the NWTRC are described below. Each military activity described in this EIS/OEIS meets a requirement that can be ultimately traced to requirements from the National Command Authority. Training activities in the NWTRC vary from basic individual or unit level events of relatively short duration involving few participants to integrated major range training events, which may involve hundreds of participants over several days.

Over the years, the tempo and types of activities have fluctuated within the NWTRC due to changing requirements, the dynamic nature of international events, the introduction of advances in warfighting doctrine and procedures, and force structure changes. Such developments have influenced the frequency, duration, intensity, and location of required training. The factors influencing tempo and types of activities are variable by nature, and will continue to cause fluctuations in training activities within the NWTRC. Accordingly, training activity data used throughout this EIS/OEIS are a representative baseline for evaluating impacts that may result from the proposed training activities.

With reference to criteria identified in Section 2.3.1, the No Action Alternative supports criteria 3, 6, 7, and 9, while only partially satisfying criteria 1 and 5. The No Action Alternative does not support criteria 2, 4, 8, and 10.

2.4.1 Description of Current and Future Training Activities within the NWTRC

For purposes of analysis, activities data for use in the EIS/OEIS are organized according to the eight PMARs: Anti-Air Warfare (AAW), Anti-Mine Warfare (AMW), Anti-Surface Warfare (ASUW), Anti-Submarine Warfare (ASW), Mine Warfare (MIW), Strike Warfare (STW), Electronic Combat (EC), and Naval Special Warfare (NSW). In addition, activities data include some RDT&E (UASs only) events. Summary descriptions of current training activities conducted in the NWTRC are provided in the following subsections. Unless specified as "Future Activity," the activities described currently take place in the NWTRC. Table 2-6, located at the end of this section, contains summary data regarding these activities. As stated earlier, the No Action Alternative stands as a baseline of current range usage, thus allowing a comparative analysis between the current tempo and desired new uses and accelerated tempo of use. Table 2-9 identifies training activities conducted in the NWTRC, categorized by PMAR. This table also identifies the location within the Range Complex where the training activity is conducted. For descriptions and locations of the OPAREA, range areas, and airspace within the NWTRC, refer to Tables 2-1 through 2-5, and Figures 2-1 and 2-2.

2.4.1.1 Anti-Air Warfare (AAW) Training

Anti-Air Warfare (AAW) is the PMAR that addresses combat activities by air and surface forces against hostile aircraft.

Air Combat Maneuvers (ACM): Air Combat Maneuvers (ACM) includes Basic Flight Maneuvers (BFMs) where aircraft engage in offensive and defensive maneuvering against each other. During an ACM engagement, no ordnance is fired. These maneuvers typically involve two aircraft; however, based upon the training requirement, ACM exercises may involve over a dozen aircraft. For the purposes of this document, aircraft activities will be described by the term 'sortie' or 'event.' A sortie is defined as a single operation by one aircraft, which uses a range or operating area. A single aircraft sortie is one complete flight (i.e., one takeoff and one final landing). An event could be one of several that occur in

one aircraft sortie. For example, in one aircraft sortie, a single aircraft could conduct an ACM event and an EC event.

ACM activities within the NWTRC are primarily conducted by EA-6B Prowlers (and EA-18G Growlers in the future) within the MOAs, and warning areas. However, for purposes of this study, ACM includes other aircraft activities conducted routinely in preparation for more advanced training flights. These other activities include instrument training, in-flight refueling, basic familiarization training, and formation flying. Additionally, Air Force or Air National Guard F-15s and Marine Corps FA-18s also conduct ACM in these areas, although on a much less frequent basis (about 5% of the total sorties). Typically, ACM sorties last about an hour to an hour and a half. Aircraft crews practice defensive maneuvering while expending chaff to evade radar targeting by a simulated missile threat. Chaff consists of aluminum-coated thin glass fibers that reflect radio frequency energy, confusing radar. The most commonly used chaff is packaged in cylinders approximately six inches long and 1.5 inches wide. These chaff packages weigh about 5 ounces each and contain a few million fibers. The chaff fibers are approximately the thickness of a human hair (generally 25.4 microns in diameter), and range in length from 0.3 to 2 inches. No other ordnance is used.

Air to Air Missile Exercise (AAMEX) (Future Activity): During an Air-to-Air-Missile Exercise (AAMEX), aircraft attack a simulated threat target aircraft with A-A missiles with the goal of destroying the target.

A typical Basic Phase (Unit Level Training) Scenario would involve a flight of two aircraft operating between 15,000 to 25,000 ft and at a speed of about 450 kts that approach a target from several miles away and, when within missile range, launch their missiles against the target. Approximately half of the missiles have live warheads and about half have an inert telemetry head package. The missiles fired are not recovered. The target is either a Tactical Air-Launched Decoy (TALD) or a LUU-2B/B illumination paraflare. Both the TALDs and the paraflares are expended. These exercises last about one hour, and are conducted in a warning area at sea outside of 12 nm and well above 3,000 ft altitude.

Surface-to-Air Gunnery Exercise (GUNEX S-A): During a Surface-to-Air Gunnery Exercise (GUNEX S-A), a ship's gun crews engage threat aircraft or missile targets with their guns with the goal of disabling or destroying the threat. A typical scenario involving a guided missile destroyer (DDG) with 5-inch guns or a fast frigate (FFG) with 76 mm Main Battery Guns is a threat aircraft or anti-ship missile simulated by an aircraft towing a target toward the ship below 10,000 ft, at a speed between 250 and 500 kts. Main battery guns would be manned and 5-inch or 76 mm rounds fired at the threat with the goal of destroying the threat before it reaches the ship. This is a defensive exercise where each gun mount fires about six rounds of 5-inch ammunition and 12 rounds of 76 mm ammunition at a target towed by an aircraft. The ship will maneuver as necessary and will typically operate at 10 to 12 kts or less during the exercise. The exercise lasts about two hours which normally includes several non-firing tracking runs followed by one or more firing runs. The target must maintain an altitude above 500 ft for safety reasons and is not destroyed during the exercise.

A typical scenario involving a DDG or FFG with 20 mm Close-in-Weapon System (CIWS) is similar, except the ships involved engage the simulated threat aircraft or missile with the CIWS. CIWS equipped ships can expend between 900 to 1400 rounds per mount per firing run for a total of up to five runs during the typical two hour exercise. The actual number of rounds expended during this exercise is dependent on the ship class, the CIWS model installed, and the available ammunition allowance. Preventive maintenance requires test firing of the CIWS prior to this exercise. Approximately 250 rounds of 20 mm are expended annually during these test firings which typically last for 30 minutes. Following the public release of the Draft EIS/OEIS, the Navy decided to replace all depleted uranium (DU) rounds used in the Pacific Ocean for training. Previously, some 20 mm CIWS rounds used during training contained DU.

This was the only use of DU for Navy training in the NWTRC. Following this change, some of the 20 mm CIWS rounds fired during Navy training in the Pacific Ocean may contain a Tungsten alloy. The specific makeup of the Tungsten rounds and the potential impacts to the environment are discussed in Chapter 3 of this EIS/OEIS.

Surface to Air Missile Exercise (SAMEX) (Future Activity): During a Surface to Air SAMEX, surface ships engage threat missiles and aircraft with surface-to-air missiles (SAMs) with the goal of disabling or destroying the threat. One live or telemetered-inert-missile is expended against a target towed by an aircraft after two or three tracking runs. The exercise lasts about two hours. A BQM-74 target drone, sometimes augmented with a Target Drone Unit (TDU), is used as an alternate target for this exercise. The BQM target is a subscale, subsonic, remote controlled ground or air launched target. A parachute deploys at the end of target flight to enable recovery at sea. The launched SAMs can be a Rolling Airframe Missile if installed on an aircraft carrier; otherwise the SAM used is the NATO Sea Sparrow Missile.

2.4.1.2 Anti-Surface Warfare (ASUW) Training

Anti-Surface Warfare (ASUW) is the PMAR that addresses combat (or interdiction) activities by air, surface, or submarine forces against hostile surface ships and boats.

Surface-to-Surface Gunnery Exercise (GUNEX): Surface gunnery exercises take place in the open ocean to provide gunnery practice for Navy ship crews. Exercises can involve a variety of surface targets that are either stationary or maneuverable. Gun systems employed against surface targets include the 5-inch, 76mm, 57mm, .50 caliber and the 7.62mm. A GUNEX lasts approximately one to two hours, depending on target services and weather conditions.

Air-to-Surface Bombing Exercises (BOMBEX A-S): During Air-to-Surface Bombing Exercises (BOMBEX A-S), Maritime Patrol Aircraft (MPA) and other fixed-wing aircraft deliver bombs against simulated surface maritime targets, typically a smoke float. MPA is a term used to describe both the P-3C Orion aircraft and the P-8 Poseidon. The P-8, also referred to as the Multi-mission Maritime Aircraft (MMA) will begin to replace the P-3 by 2013.

MPA use bombs to attack surfaced submarines and surface craft that would not present a major threat to the MPA itself. A single MPA approaches the target at a low altitude. In most training exercises, it drops inert training ordnance, such as the Bomb Dummy Unit (BDU-45) on a MK-58 smoke float used as the target. Historically, ordnance has been released throughout W-237, just south of W-237, and in international waters in accordance with international laws, rules, and regulations. P-3C squadrons from CPRW-10 are required to conduct one live-fire drop per 24-month cycle. CPRW-10 consists of three active duty VP squadrons and one Reserve squadron (VP-69). There are a total of 12 crews in each squadron. One crew will drop live-fire (consisting of four MK-82 500 lb general purpose bombs) while the remaining 11 crews will drop inert ordnance (consisting of four Bomb Dummy Units [BDU-45s]) for a total of 12 drops per squadron per cycle. Accordingly, 96 pieces of ordnance, consisting of eight MK-82 and 88 BDU-45, are dropped annually. Each BOMBEX A-S can take up to 4 hours to complete.

High-Speed Anti-Radiation Missile Exercise (HARMEX): A High Speed Anti-Radiation Missile Exercise (HARMEX) is an integral part of EA-6B and EA-18G squadron training. It trains aircrews to conduct electronic attack using the HARM missile, which is the primary weapon for the Suppression of Enemy Air Defenses (SEAD), and is designed to attack emitting radars. Only non-firing HARMs are used during HARMEX events on the Range Complex. During a typical HARMEX, an EA-6B or EA-18G flying at a high altitude (>10,000 ft. AGL), would receive and identify an electronic signal from a simulated enemy radar. The aircrew would then position themselves for the optimum firing solution and simulate firing a HARM missile at the electronic signal. HARMEXs are non-firing events that typically last one to two

hours. In addition to HARMEX training in support of ASUW, it also supports STW and is included under that warfare area also.

Sinking Exercise (SINKEX): A Sinking Exercise (SINKEX) is typically conducted by aircraft, surface ships, and submarines in order to take advantage of a full size ship target and an opportunity to fire live weapons.

The target for a SINKEX is typically a decommissioned combatant or merchant ship. These target vessels are remediated to standards set by the Environmental Protection Agency (EPA). In accordance with EPA permits, the target is towed out to sea (at least 50 nm [92.6 km]) and set adrift at the SINKEX location, typically in deep water (at least 1,000 fathoms [6,000 feet]) where it will not be a navigation hazard to other shipping. The EPA granted the Department of the Navy (DoN) a general permit through the Marine Protection, Research, and Sanctuaries Act to transport vessels "for the purpose of sinking such vessels in ocean waters…" (40 CFR § 229.2). Subparagraph (a) (3) of this regulation states "All such vessel sinkings shall be conducted in water at least 1,000 fathoms (6,000 feet) deep and at least 50 nautical miles from land."

Ship, aircraft, and submarine crews typically are scheduled to attack the target with coordinated tactics and deliver live ordnance to sink the target. Inert ordnance is often used during the first stages of the event so that the target may be available for a longer time. The duration of a SINKEX is unpredictable because it ends when the target sinks, but the goal is to give all forces involved in the exercise an opportunity to deliver their live ordnance. Sometimes the target will begin to sink immediately after the first weapon impact and sometimes only after multiple impacts by a variety of weapons. Typically, the exercise lasts 4 to 8 hours, especially if inert ordnance such as 5-inch gun projectiles or MK-76 dummy bombs are used during the first hours. If the hulk is not sunk by weapons, it will be sunk by EOD personnel setting off demolition charges previously placed on the ship.

2.4.1.3 Anti-Submarine Warfare (ASW) Training

Tracking Exercise (TRACKEX) for ASW trains aircraft, ship, and submarine crews in tactics, techniques, and procedures for search, detection, localization, and tracking of submarines with the goal of determining a firing solution that could be used to launch a torpedo and destroy the submarine. A typical unit-level exercise involves one ASW unit (aircraft, ship, or submarine) versus one target, usually a MK-39 Expendable Mobile ASW Training Target (EMATT) or a live submarine. The target may be non-evading while operating on a specified track or fully evasive. Participating units use active and passive sensors, including hull-mounted sonar, towed arrays, variable depth sonar, and sonobuoys for tracking. If the exercise continues into the firing of a practice torpedo it is termed a Torpedo Exercise (TORPEX). The ASW TORPEX usually starts as a TRACKEX to achieve the firing solution.

ASW TRACKEX Maritime Patrol Aircraft (MPA): During these activities, a typical scenario would involve a single MPA dropping sonobuoys, from an altitude below 3,000 ft, and sometimes as low as 400 ft, into specific patterns designed for both the anticipated threat submarine and the specific water conditions. These patterns vary in size and coverage area based on anticipated threat and water conditions. Typically, passive sonobuoys will be used first, so the threat submarine is not alerted. Active sonobuoys will be used as required either to locate extremely quiet submarines, or to further localize and track submarines previously detected by passive sonobuoys. A TRACKEX-MPA usually takes two to four hours. No torpedoes are fired during this training activity

ASW TRACKEX Extended Echo Ranging (EER) and Improved Extended Echo Ranging (IEER): This activity is an at-sea flying event, typically conducted below 3,000 ft, that is designed to train MPA crews in the deployment and use of the EER or IEER sonobuoy systems. These systems use the SSQ-110A explosive source sonobuoy as the signal source and the SSQ-77 as the receiver sonobuoy. A typical

EER/IEER activity lasts six hours, with one hour for sonobuoy pattern deployment and five hours for active search. EER/IEER events have historically been conducted a minimum of 50 nm from shore.

ASW TRACKEX (Surface Ship): In the PACNW OPAREA, locally based surface ships do not routinely conduct ASW Tracking exercises. However, mid-frequency active (MFA) sonar is used occasionally (one to one and a half hours) during ship transits through the OPAREA. All surface ship MFA sonar use is documented in this training activity description. Historically, as well as projected for the future, this use of sonar takes place greater than 50 nm from shore.

ASW TRACKEX (Submarine): ASW TRACKEX is a primary training exercise for Bangor-based submarines. Training is conducted at the intermediate level and occurs in the PACNW OPAREA. These activities involve P-3 aircraft approximately 30% of the time. Training events in which P-3s are used typically last 8 to 12 hours. During these activities submarines use passive sonar sensors to search, detect, classify, localize and track the threat submarine with the goal of developing a firing solution that could be used to launch a torpedo and destroy the threat submarine. However, no torpedoes are fired during this training activity.

2.4.1.4 Electronic Combat (EC) Training

Electronic Combat (EC) prevents or reduces the effective use of enemy electronic equipment and ensures the continued use of friendly equipment as well as the command and control of said equipment. To provide effective training, this type of training needs to be conducted against sea based, land based, and airborne threats, or a combination of all three.

Electronic Support (ES) provides the capability to intercept, identify, and locate enemy emitters while Electronic Attack (EA) employs tactics, such as electronic jamming, to prevent or reduce effective use of enemy electronic equipment and command and control capability. EA and ES are subsets of EC. Typical EC activities include signals analysis and use of airborne and surface electronic jamming devices to defeat tracking radar systems. During these activities, aircraft, surface ships, and submarines attempt to control critical portions of the electromagnetic spectrum used by threat radars, communications equipment, and electronic detection equipment to degrade or deny the enemy's ability to defend its forces from attack and/or recognize an emerging threat early enough to take the necessary defensive actions.

EP-3, P-3C, and EA-6B aircraft stationed at NASWI train with a land based electronic signal emitter located at OLF Coupeville and conduct ES and EA training in the Darrington Area. EA-6B aircraft also fly threat profiles against surface ships to train shipboard crews on the detection of threat aircraft electronic signatures or to counter jamming of their own electronic equipment. EC training activities typically last one to two hours.

2.4.1.5 Mine Warfare (MIW) Training

Mine Countermeasures: Naval EOD activities require proficiency in underwater mine neutralization. Mine neutralization activities consist of underwater demolitions designed to train personnel in the destruction of mines, unexploded ordnance (UXO), obstacles, or other structures in an area to prevent interference with friendly or neutral forces and non-combatants.

EOD units conduct underwater detonation training at EOD Crescent Harbor, EOD Indian Island, and EOD Floral Point. A 2.5 lb charge of C-4 is used, consisting of one surface or one subsurface detonation. Only one detonation takes place per activity, and only one activity occurs in any one day. Small boats such as MK-5 combat rubber raiding craft, or MK-7 and 9 (meters in length, respectively) Rigid Hull Inflatable Boats (RHIB) are used to insert personnel for underwater activities and either a helicopter (H-60) or RHIB is used for insertion for surface activities. A typical scenario involves placing a dummy

mine shape on the seafloor. Two divers from one of two small boats enter the water and begin searching for the mine. When located, the mine is marked with a buoy. Later, two divers place the C-4 charge on or around the mine. Following confirmation that the area is visually clear of marine mammals, sea turtles, and birds, the charge is detonated manually (with a time-delay fuse) or remotely. After the detonation, both boats return to the detonation site. All surface debris, consisting mainly of floats and attached equipment, is retrieved. The divers retrieve debris from the seafloor, which consists mainly of pieces of the mine (the charge is consumed in the detonation). In cases where the mine is only disabled, not destroyed, the mine is either loaded into the primary boat, if the mine is small enough, or suspended below the boat. The total duration of the exercise is four hours for an underwater detonation and one hour for a surface detonation.

Land Demolitions: Land demolitions occur at the DTR Seaplane Base and at DTR Bangor. A typical land demolition training exercise has an eight hour duration and involves disrupting inert Improvised Explosive Devices (IED) using different explosively actuated tools. Typical explosives used are C-4 demolition blocks, detonating cord, and electric blasting caps. The net explosive weight (NEW) training limit is five lbs. per charge at DTR Bangor and an EOD self-imposed limit of one lb per charge at DTR Seaplane Base. Other EOD training activity occurs outside DTR Seaplane Base within the Seaplane Base Survival Area to include locating and defusing (inert) Mark 80 series General Purpose bombs and simulated improvised explosive devices.

Land demolitions are conducted at DTR Seaplane Base approximately six times per month by EODMU-11. EODMU-11 Detachment Bangor conducts approximately six events at DTR Bangor each year.

2.4.1.6 Naval Special Warfare, Explosive Ordnance Disposal, and Search and Rescue Training

NSW forces (SEALs and Special Boat Units [SBUs]) train to conduct military activities in five Special Operations mission areas: unconventional warfare, direct action, special reconnaissance, foreign internal defense, and counterterrorism. Specific training events include:

Insertion/Extraction: Insertion/extraction activities hone individual skills in delivery and withdrawal of personnel and equipment using unconventional methods. Helicopter Rope Suspension Training (HRST) and parachute training are the principal insertion/extraction methods used by EOD teams at the NWTRC.

HRST encompasses Helocast, Special Purpose Insertion and Extraction (SPIE), rappel, and fast rope exercises. Helocast training involves a helicopter flying slowly and low over the water near a target to allow EOD team members to jump out one at a time. The technique is typically used for quick insertion to dispose of hazardous floating mines. A SPIE rigging exercise involves up to eight personnel attached to a rope suspended from a helicopter, allowing the EOD team to be hoisted from or lowered onto the ground without having to land the helicopter. In fast roping, EOD team members slide down a rope from a helicopter, which hovers as high as 60 feet off the ground. Personnel from EODMU-11 detachments conduct HRST training activities monthly throughout the Seaplane Base using an H-60.

The parachute insertion method is designed to place Special Forces teams into an objective area undetected to conduct clandestine activities, either reconnaissance and surveillance, or direct action type missions. Typical duration of one of these activities is three to five hours. Personnel from EODMU-11 detachments perform parachute training four days per month at OLF Coupeville and two days per month at EOD Crescent Harbor.

Insertion/Extraction activities also include Search and Rescue (SAR) training that takes place at the Seaplane Base survival area. This activity involves a helicopter landing and simulated extraction of a

survivor (typically one of the helicopter crewmembers). The SAR helicopter, an H-60, approaches the survivor, finds a suitable landing zone, lands, recovers the survivor, then departs the area with the survivor onboard.

NSW (Naval Special Warfare) Training Events: SEAL Delivery Vehicle Team ONE (SDVT-1) from Naval Special Warfare Group THREE (NSWG-3) in San Diego conducts underwater Unit Level Training (ULT) exercises twice a year within the NWTRC. For two to three weeks during these training detachments, SEALs conduct land-based training at Indian Island. The SDV is launched from Port Townsend (see Figure 2-5), travels for approximately three hours, and delivers four to six SEALs to Indian Island where over-the-beach (OTB) and special reconnaissance training occurs. When the land portion of the training is complete—typically 2 days—the SDV returns and the SEALs transit back to Port Townsend via the SDV. No explosives or live ammunition are used during this training.

2.4.1.7 Strike Warfare (STW) Training

Strike Warfare (STW) is the PMAR that addresses combat (or interdiction) activities by air and surface forces against hostile land based forces and assets.

High-Speed Anti-Radiation Missile Exercise (HARMEX): A HARMEX under STW is identical to a HARMEX under ASUW, except that as part of the STW mission, a HARMEX would target a land radar. See Section 2.4.1.2 for HARMEX details.

2.4.1.8 Support Activities

Support Activities are activities that directly contribute to the execution and success of forces conducting other PMARs.

Intelligence, Surveillance, and Reconnaissance (ISR): Intelligence refers to the information and knowledge obtained through observation, investigation, analysis, or understanding. Surveillance and reconnaissance refer to the means by which the information is observed. Surveillance is the systematic observation of a targeted area or group, usually over an extended time, while reconnaissance is a specific mission performed to obtain specific data about a target.

ISR training is conducted by MPA in W-237 and the PACNW OPAREA. Activities typically last six hours and involve a crew of 11 personnel. P-3 aircrews use a variety of intelligence gathering and surveillance methods, including visual, infrared, electronic, radar, and acoustic. EP-3 and EA-6B crews conduct ISR training as well, but to a lesser extent than P-3C crews.

On occasion, small unit special operations forces (SOF) air, surface, subsurface, and ground ISR activities occur in the Seaplane Base Survival Area. Examples of Special Forces units that have used the Survival Area for ground ISR training include Navy Reserve Mobile Inshore Undersea Warfare Units, U.S. Army Special Forces, and U.S. Army Intelligence forces.

Unmanned Aerial System (UAS) Training and RDT&E: Forces employ UAS to obtain information about the activities of an enemy, potential enemy, or tactical area of operations by use of various onboard surveillance systems including: visual, aural, electronic, photographic, or other means.

There are currently numerous types of UAS employed to obtain intelligence data on threats. UAS are typically flown at altitudes well above 3,000 ft in patterns to best collect the required data, yet remain beyond the reach of threat weapon systems. The UAS may be controlled by a pilot at a remote location, just as if the pilot were onboard, or may fly a preplanned, preprogrammed route from start to finish. Missions will typically last four to six hours, but will vary depending on the scheduled mission training.

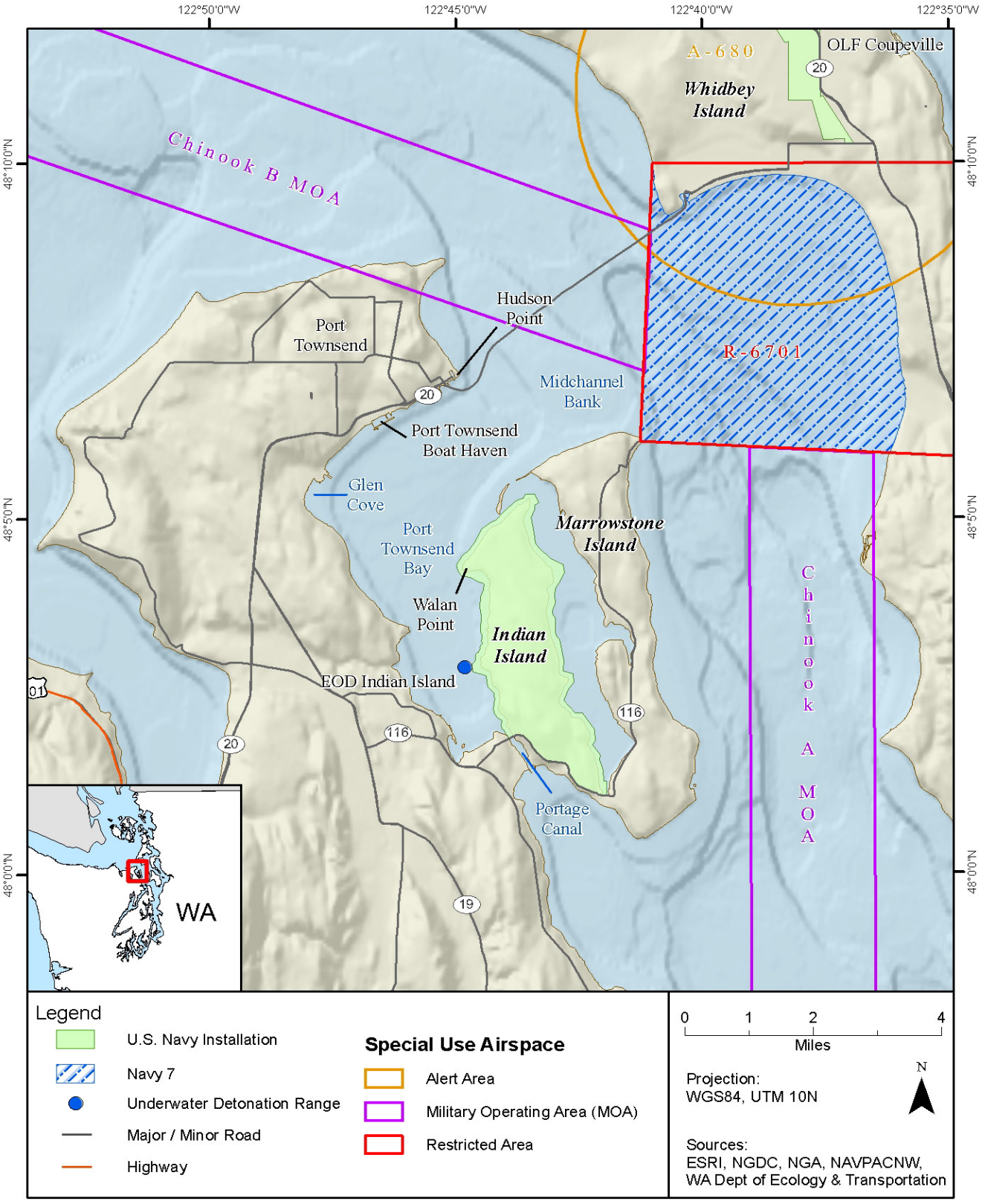


Figure 2-5: NWTRC Inshore Area (Indian Island)

The Scan Eagle UAS is a relatively small aircraft that is currently tested in the NWTRC. Typically these activities, conducted in R-6701, occur three times a year for three to four days each, and consist of maritime testing and maritime training. During each of the three to four day testing, the UAS activity lasts approximately six hours. UAS activities can be conducted in W-237. However, due to high sea states, Scan Eagle UAS RDT&E activities in W-237 are not anticipated to continue. The Broad Area Maritime Surveillance (BAMS) system is a future Navy system that may be used for training within the NWTRC. The specific UAS to be used for this system has yet to be determined, but it will likely be a large aircraft such as the Global Hawk, Predator B, or a similar UAS. These aircraft are roughly the size of common military tactical aircraft such as the EA-6B Prowler or FA-18 Hornet.

The most common area in the NWTRC for BAMS, or any other large UAS, training activities would be in W-237. Current Federal Aviation Regulations permit unrestricted UAS activities only in Warning Areas and Restricted airspace. BAMS generally will operate at high altitudes (40,000 ft and higher).

2.5 ALTERNATIVE 1 – INCREASE TRAINING ACTIVITIES AND ACCOMMODATE FORCE STRUCTURE CHANGES

Alternative 1 is a proposal designed to meet Navy and DoD current and near-term operational training requirements. If Alternative 1 were to be selected, in addition to accommodating training activities currently conducted, the NWTRC would support an increase in most training activities to include force structure changes associated with the introduction of new weapon systems, vessels, and aircraft into the Fleet. Under Alternative 1, most baseline-training activities would be increased. In addition, training activities associated with force structure changes would be implemented for the EA-18G Growler, Guided Missile Submarine (SSGN), P-8 Multimission Maritime Aircraft (MMA), and UASs. Force structure changes associated with new weapons systems would include new A-A missiles, and new sonobuoys.

Although this alternative includes potential increases in the number of certain individual training activities while aircraft are airborne and ships are at sea, these additional activities alone do not correspond to an increase in either aircraft flights or flight hours, or at-sea time for the ships.

2.5.1 Revised Level of Activities

Table 2-6 identifies the baseline and proposed changes in activities in the NWTRC if Alternative 1 were to be implemented. Although most activities will increase in Alternative 1, mine countermeasure activities will decrease. Under Alternative 1, no more than two underwater detonations per year will take place at Crescent Harbor, and no more than one detonation per year at Indian Island and Floral Point for a maximum of 4 detonations per year.

2.5.2 Force Structure Changes

The NWTRC is required to accommodate and support training with new ships, aircraft, and vehicles as they become operational in the Fleet. In addition, the NWTRC is required to support training with new weapons/sensor systems. The Navy has identified several future platforms and weapons/sensor systems that are in development and likely to be incorporated into Navy training requirements within the 10-year planning horizon. Several of these new technologies are in early stages of development, and thus specific concepts of operations, operating parameters, or training requirements have not yet been developed and thus are not available.

While this alternative meets the Navy's purpose and need, it does not meet established Navy minimum range capability requirements nor does it optimize the training capabilities of the Range Complex. With reference to the criteria identified in Section 2.3.1, Alternative 1 supports criteria 3 and 6-9, while only partially satisfying criteria 1, 2, and 5. Alternative 1 does not support criteria 4 and 10.

Specific force structure changes within the NWTRC are based on the Navy's knowledge of future requirements for the use of new platforms and weapons systems and based on the level of information available to evaluate potential environmental impacts. Therefore, this EIS/OEIS, to the extent feasible, will evaluate potential environmental impacts associated with the introduction of the following platforms and weapons/sensor systems.

2.5.2.1 New Platforms/Vehicles

This section describes new aircraft that would be operating in the NWTRC as part of Alternative 1. Each of these aircraft has been analyzed previously in separate NEPA documents.

2.5.2.1.1 EA-18G Growler

The EA-18G Growler is an electronic combat version of the FA-18 E/F that will replace the EA-6B Prowler. The Growler will have an integrated suite of EC systems that will allow it to perform the same missions as the EA-6B. In addition to the EA-6B missions, the EA-18G will have a limited self-protection capability requiring aircrews to train for offensive air-to-air missile engagements and conduct missile exercises. The EA-18G transition began in early 2009 and will be completed by 2013.

2.5.2.1.2 P-8 Multimission Maritime Aircraft (MMA)

The P-8A MMA is the Navy's replacement for the aging P-3C Orion aircraft. It is a modified Boeing 737-800ERX which brings together a highly reliable airframe and high-bypass turbo fan jet engine with a fully connected, state-of-the-art open architecture mission system. This combination, coupled with next-generation sensors, will dramatically improve ASW and ASUW capabilities.

The MMA will ensure the Navy's future capability in long-range maritime patrol. It will be equipped with modern ASW, ASUW, and ISR sensors. In short, MMA is a long-range ASW, ASUW, ISR aircraft that is capable of broad-area, maritime and littoral operations.

The Navy will begin the replacement of P-3C aircraft with the P-8A in 2012. Based on the Record of Decision for the MMA Homebasing EIS (DoN 2008), four P-8A squadrons will replace the existing four P-3C squadrons at NASWI. Initial Operating Capability (IOC) is expected in 2013 with Final Operating Capability (FOC) expected by 2019. IOC is established when one P-8A squadron is fully trained and equipped, ready to deploy; FOC is established when all P-3C squadrons have been transitioned. As P-8A live training is expected to be supplemented with virtual training to a greater degree than P-3C training, P-8A training activities in the NWTRC are likely to be less than those currently conducted by P-3C's.

2.5.2.1.3 Unmanned Aerial Systems (UAS)

Broad Area Maritime Surveillance (BAMS) UAS. The BAMS UAS is being designed to support persistent, worldwide access through multi-sensor, maritime ISR providing unmatched awareness of the battlespace. It will support a spectrum of Fleet missions serving as a distributed ISR node in the overall naval environment. These missions include maritime surveillance, Battle-Damage Assessment (BDA), port surveillance and homeland security support, MIW, maritime interdiction, surface warfare, counter drug operations, and battlespace management. The BAMS will operate at altitudes above 40,000 feet, above the weather and most air traffic to conduct continuous open-ocean and littoral surveillance of targets as small as exposed submarine periscopes. Operation of these systems could produce new requirements for Range Complexes in terms of airspace and frequency management. Because current FAA airspace structure does not allow unmanned aircraft in MOAs, UAS activities are limited to Restricted Areas or offshore Warning Areas. Due to the size of NWTRC Restricted Areas and the airspace size requirements of the BAMS mission, the activities can only take place in W-237. IOC is anticipated for 2009.

Navy Unmanned Combat Air System (N-UCAS). The N-UCAS (Grumman X-47B) program is a Navy effort to demonstrate the technical feasibility, military utility, and operational value of an aircraft carrier based, networked system of high performance, weaponized UASs to effectively and affordably execute 21st century combat missions, including SEAD, surveillance, and precision strike within the emerging global command and control architecture. Operation of these systems could produce new requirements for range complexes in terms of airspace, frequency management, and target sets. IOC of these systems has not yet been established.

2.5.2.2 New Weapons Systems

Under the Proposed Action, several weapons systems for training are being introduced that warrant evaluation in this EIS/OEIS. Each of these systems has previously received appropriate NEPA analysis.

2.5.2.2.1 AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM)

The Advanced Medium-Range Air-to-Air Missile (AMRAAM) is a supersonic, air launched, aerial intercept, guided missile employing active radar target tracking, proportional navigation guidance, and active Radio Frequency (RF) target detection. It employs active, semi-active, and inertial navigational methods of guidance to provide an autonomous launch and leave capability against single and multiple targets in all environments. The EA-18G Growler, the replacement aircraft for the EA-6B Prowler, will have an air-to-air missile capability. The NWTRC will be required to support training for this new capability. Air-to-air missile training, including use of live AMRAAM missiles, will occur in W-237.

2.5.2.2.2 Improved Extended Echo Ranging (IEER) Sonobuoy

The Improved Extended Echo Ranging (IEER) system is an improved multi-static active acoustic sensor, which employs a new sonobuoy coupled with improved processing algorithms to extend the EER deep-water search capability into the shallow waters of the littoral. The IEER system was developed by the Navy in response to the fleet need for a large-area search capability against diesel submarines operating in littoral waters. The system uses the same source sonobuoy as used in the EER system, the AN/SSQ-110A sonobuoy. It operates on one of 31 selectable radio frequency channels and has two sections. The upper section is called the control sonobuoy and is similar to the upper electronics package of the AN/SSQ-62 Directional Command Activated Sonobuoy System (DICASS) sonobuoy. The lower section consists of two Signal Underwater Sound (SUS) explosive payloads of Class A explosive weighing 4.2 pounds each. When commanded by the aircrew, the SUS charges explode, creating a loud acoustic signal. The echoes from the explosive charge are then analyzed on the aircraft to determine a submarine's position. Since IEER has become operationally capable, the Navy has implemented mitigation measures through a coordinated process with NMFS under the national defense exemption of the MMPA. Those measures will be discussed in more detail in Chapter 5 of this document.

2.5.2.2.3 Advanced Extended Echo Ranging (AEER)

The Advanced Extended Echo Ranging (AEER) program examines improvements in both long-range shallow and deep water ASW search using active sources (Air Deployable Low Frequency Projector [ADLFP], Advance Ranging Source [ARS]) and passive sonobuoy receivers (Air Deployed Active Receiver, or ADAR). The signal processing is provided by research conducted under the Advanced Multi-static Processing Program (AMSP).

The proposed AEER system is similar to the existing EER/IEER system. The AEER system will use the same ADAR sonobuoy as the acoustic receiver and will be used for a large area ASW search capability in both shallow and deep water. However, instead of using an explosive AN/SQS-110A as an impulsive source for the active acoustic wave, the AEER system will use a battery powered (electronic) source for the AN/SSQ-125 sonobuoy. The output and operational parameters for the AN/SSQ-125 sonobuoy

(source levels, frequency, wave forms, etc.) are classified; however, this sonobuoy is intended to replace the EER/IEER's use of explosives and is scheduled to be deployed in 2011. Acoustic impact analysis for the AN/SSQ-125 in this document assumes a similar per-sonobuoy effect as that modeled for the DICASS sonobuoy.

2.5.2.3 Relocation of Forces

In April 2008, the Navy made the decision to relocate Explosive Ordnance Disposal Mobile Unit Eleven (EODMU Eleven) forces out of the NWTRC Study Area to a new homebase in Imperial Beach, CA. This move is planned to be completed in the summer of 2010. Two EOD Shore Detachments (Bangor and Northwest) will remain in the NWTRC. These Shore Detachments report to Commander, Navy Region Northwest and respond to regional Navy tasking and incidents. As a result of the EODMU Eleven relocation, mine warfare underwater detonation (UNDET) training significantly decreased in late 2009 from a yearly maximum of 60 UNDETs as analyzed in the No Action Alternative (the baseline) to no more than four annual UNDETs as analyzed in Alternatives 1 and 2. The increase in EOD training activities in Imperial Beach, CA will be addressed in a separate NEPA analysis.

2.5.2.4 New Instrumentation Technology

The NWTRC will acquire improved technology and capabilities to score, track, and provide feedback. Technology is also permitting the fielding of non-fixed site, mobile tracking ranges.

2.6 ALTERNATIVE 2 – INCREASE TRAINING ACTIVITIES, ACCOMMODATE FORCE STRUCTURE CHANGES, AND IMPLEMENT RANGE ENHANCEMENTS

Implementation of this alternative would include all elements of Alternative 1 (accommodating training activities currently conducted, increasing training activities, and accommodating force structure changes). In addition, under Alternative 2:

- In order to optimize training throughput and meet the FRTP, training activities of the types currently conducted would be increased over levels identified in Alternative 1 (see Table 2-9);
- Range enhancements would be implemented, to include new electronic combat threat simulators/targets, development of a small scale underwater training minefield, development of a PUTR, and development of air and surface target services as described in Section 2.5.2.

Alternative 2 is the Preferred Alternative, because it would optimize the training capability of the NWTRC and meet Navy minimum required capabilities as documented in the Navy Ranges Required Capabilities Document (RCD) of September 8, 2005. Alternative 2 fully meets the criteria identified in Section 2.3.1.

Although this alternative includes potential increases in the number of certain individual training activities while aircraft are airborne and ships are at sea, these additional activities alone do not correspond to an increase in either aircraft flights or flight hours, or at-sea time for the ships.

2.6.1 Revised Level of Activities

Table 2-9 identifies the baseline and proposed changes in activities in the NWTRC under Alternative 2. Although most activities will increase under Alternative 2, mine countermeasure activities will decrease. Under Alternative 2, no more than two underwater detonations per year will take place at Crescent Harbor, and no more than one detonation per year at Indian Island and Floral Point for a maximum of 4 detonations per year.

2.6.2 NWTRC Enhancements

The Navy has identified specific enhancements and recommendations to optimize range capabilities required to adequately support training for all missions and roles assigned to the NWTRC. Enhancement recommendations were based on capability shortfalls (or gaps) and were assessed using the Navy range required capabilities as defined by the RCD of September 2005. Proposed enhancements for the NWTRC are discussed below and will be analyzed in this EIS/OEIS.

2.6.2.1 New Electronic Combat (EC) Threat Simulators/Targets

Electronic Combat (EC) is one of the principal elements of an OPFOR. Every warfare type supported by the NWTRC (except basic NSW/EOD) requires an OPFOR with the capability to produce RF signatures characteristic of the employment of EC threats by an OPFOR. For Basic level training, EC Threat Level 1 is required (a limited number [1-2] of threat weapons systems emitters used primarily for signal recognition). For Intermediate level training, EC Threat Level 2 is required (sufficient EC emitters to provide multiple coordinated threats with accurate threat replication). Additionally, EC is the primary mission of the EA-6B, EA-18G, and EP-3, and a secondary mission of the P-3 - all aircraft based at NASWI. These aircrews require multi-axis threat training currently unattainable at the NWTRC. Similarly, ships and submarines require EC training. Due to their antenna height limitations and the curvature of the earth, effective EC training could only be conducted if the emitter is located on or very near the coastline. Pacific Beach, Washington is one potential location for a fixed land based electronic warfare (EW) emitter. This location, or a similar site on the Washington coast, would allow EC training at sea for ships, submarines, and aircraft, and provide the possibility of multi-axis threat training for aircraft when combined with the existing EW emitter at OLF Coupeville or EC threat simulation requirements of contract air-target and/or surface-target services. This location would also allow for EC training of aircrews to take place in the Olympic MOAs.

2.6.2.1.1 Effect on Training

The overall number of sorties or training events will not increase as a result of these enhancements. Instead, training flights or ship training events that historically did not include EC training as part of the event, will now conduct that training. For example, a ship operating in the PACNW OPAREA for the purposes of navigation training will simultaneously conduct EC training if a coastal threat simulator is functional. This is a new mission area for ships training in the NWTRC since no coastal threat simulator existed previously. For aircraft, this training was previously conducted only when within range of the NASWI threat simulator, however, they can now include this mission in their W-237 training flights.

2.6.2.2 Development of the Portable Undersea Tracking Range

The PUTR is a self-contained, portable, undersea tracking capability that employs modern technologies to support coordinated undersea warfare training for Forward Deployed Naval Forces (FDNF). PUTR will be available in two variants to support both shallow and deep water remote activities in keeping with Navy requirements to exercise and evaluate weapons systems and crews in the environments that replicate the potential combat area. The system will be capable of tracking submarines, surface ships, weapons, targets, and Unmanned Underwater Vehicles (UUVs) and distribute the data to a data processing and display system, either aboard ship, or at a shore site.

The Portable Undersea Tracking Range (PUTR) would be developed to support ASW training in areas where the ocean depth is between 300 ft and 12,000 ft and at least 3 nm from land. Although location decisions have not been made, the PUTR would be used primarily off the Washington coast. Because the system is portable, it can be temporarily placed anywhere that its depth requirements are met. This proposed project would temporarily instrument 25-square-mile or smaller areas on the seafloor, and would provide high fidelity crew feedback and scoring of crew performance during ASW training

activities. When training is complete, the PUTR equipment would be recovered. All of the potential PUTR areas have been used for ASW training for decades.

No on-shore construction would take place. Seven electronics packages, each approximately 3 ft long by 2 ft in diameter, would be temporarily installed on the seafloor by a range boat, in water depths greater than 600 ft. The anchors used to keep the electronics packages on the seafloor would be either concrete or sand bags, which would be approximately 1.5 ft-by-1.5 ft and would weigh approximately 300 pounds. Operation of this range requires that underwater participants transmit their locations via pingers (see "Range Tracking Pingers" below). Each package consists of a hydrophone that receives pinger signals, and a transducer that sends an acoustic "uplink" of locating data to the range boat. The uplink signal is transmitted at 8.8 kilohertz (kHz), 17 kHz, or 40 kHz, at a source level of 190 decibels (dB). The Portable Undersea Tracking Range system also incorporates an underwater voice capability that transmits at 8-11 kHz and a source level of 190 dB. Each of these packages is powered by a D cell alkaline battery. After the end of the battery life, the electronic packages would be recovered and the anchors would remain on the seafloor. The Navy proposes to deploy this system for 3 months of the year (approximately June – August), and to conduct TRACKEX activities for 10 days per month in an area beyond 3 nm from shore. During each of the 30 days of annual operation, the PUTR would be in use for 5 hours each day.

Range tracking pingers would be used on ships, submarines, and ASW targets when ASW TRACKEX training is conducted on the PUTR. A typical range pinger generates a 12.93 kHz sine wave in pulses with a maximum duty cycle of 30 milliseconds (3% duty cycle) and has a design power of 194 dB re 1 micro-Pascal at 1 meter. Although the specific exercise, and number and type of participants will determine the number of pingers in use at any time, a maximum of three pingers and a minimum of one pinger would be used for each ASW training activity. On average, two pingers would be in use for 3 hours each during PUTR operational days.

2.6.2.2.1 Effect on Training

Although some activities will increase in annual tempo, no new training activities would result from the temporary and occasional use of the PUTR. Surface ship MFA sonar use in the NWTRC is anticipated to increase by approximately 10 percent as a result of PUTR use. There will be no increases in aircraft training events or sonobuoy use.

2.6.2.3 Development of Air Target Services

Navy training requires air targets for Basic and Intermediate AAW, A-A, and S-A GUNEX and MISSLEX. Live rotary and/or fixed wing OPFOR aircraft are required for Basic and Intermediate AAW, ASUW, and Intermediate level ASW, STW, and EC. Additionally, EC Threat Level 1 and 2 are required for almost all training types and levels supported in the NWTRC. Air target services can be used to generate EC threats as well as the visual and spectral signatures of real threats. Additionally, local air and surface units, and potentially submarine units in the future, require air target and EC Threat Level 1 capability to complete AAW missile and gunnery training and exercises at the basic level. Additionally, the EA-18G will have an offensive AAW capability and as such, require air targets. Currently, no air target services exist for the NWTRC. All surface combatant ships must complete this training in the Southern California Range Complex. The target system needs to have the capability to support both air-to-air (A-A) and surface-to-air (S-A) missile exercises, and include subsonic and supersonic aircraft or drones that can operate from surface to 50,000 feet for Intermediate level training. The aircraft or drones in the target system should be capable of active EC jamming and simulated cruise missile launch capabilities. For Basic level AAW training, towed targets are required. Air Target services are traditionally used to provide OPFOR targets.

Due to lack of capability in the NWTRC, surface combatants stationed in the Puget Sound must complete parts of their Basic and Intermediate AAW training elsewhere. This results in increased travel costs; ship/aircraft fuel costs, increased maintenance costs due to increased flying and steaming times to go to other training venues to achieve the training as well as time away from homeport and families which negatively impacts retention and quality of service. To meet Chief of Naval Operations mandated time-in-homeport requirements it is important that the NWTRC meet minimum required capabilities to conduct AAW.

2.6.2.3.1 Effect on Training

Three current training activities will be positively affected by the introduction of new air target services in the NWTRC. The activities and impacts follow:

- A-A MISSILEX. Aircraft have previously conducted this training activity in the NWTRC, but on a somewhat limited scale. With the introduction of the EA-18G and its air-to-air missile capability, the requirement will increase. The new air services will allow these aircrews to train locally, and with a broader range of targets. See Table 2-8 for specific increases.
- S-A GUNEX. Similar to the A-A MISSILEX for aircraft above, ships will conduct S-A GUNEX at an increased level with the increased targets and opportunities.
- S-A MISSILEX. Aircraft carriers conduct S-A MISSILEX as a training requirement. No other locally based ships are required to complete this live fire training. Previously, locally based aircraft carriers traveled to other training ranges to complete this requirement. If the BQM-74E or similar target is included in the increased air target services, this new mission will be conducted in the NWTRC.

2.6.2.4 Development of Surface Target Services

The Proposed Action includes the development of Surface target services. The Navy requires surface targets for ship, submarine, and aircraft crews to complete ASUW training. Surface target services can be used to generate EC threats as well as the visual and spectral signatures of real threats. The NWTRC does not have ASUW targets or target services in the complex. Surface ships have the ability to launch a Floating At-Sea Target (FAST) which meets the stationary requirement but these do not replicate the visual or spectral signature of threat platforms. Aircraft and submarines do not have the capability to launch a FAST, although aircraft can launch a marine floating marker (flare), which also does not replicate the visual or spectral signature of real threats.

Due to lack of capability in the NWTRC, surface combatants stationed in the Puget Sound must complete parts of their Basic and Intermediate ASUW training in other training venues. This results in increased travel costs; ship/aircraft fuel costs, increased maintenance costs due to increased flying and steaming times to go to other training venues to achieve the training as well as time away from homeport and families which negatively impacts retention and quality of service. To meet Chief of Naval Operations mandated time-in-homeport requirements it is important that the NWTRC meet minimum required capabilities to conduct ASUW.

2.6.2.4.1 Effect on Training

Surface-to-surface gunnery exercises will increase as a result of the development of surface target services. Currently, training is limited to the type of targets available for surface ships. New moving targets will greatly enhance the training available in the NWTRC. See Table 2-7 for actual increases in training activities.

2.6.2.5 Small Scale Underwater Training Minefield

The addition of a small scale underwater training minefield in the NWTRC will allow submarines to conduct mine avoidance training in the range complex. Mine avoidance exercises train ship and submarine crews to detect and avoid underwater mines. The underwater minefield will consist of approximately 15 mine-like shapes tethered to anchors on the ocean floor, in depths of 500 to 600 ft (150 to 185 m) and rising to within 400 to 500 ft (120 to 150 m) of the ocean surface. These mine-like shapes will be places within an area approximately 2 nm by 2 nm. Although the specific location for this minefield has not yet been determined, it would be installed off the coast of Washington, outside of the OCNMS (Figure 1-1).

2.6.2.5.1 Effect on Training

Until this underwater training minefield is installed, no mine avoidance training is possible in the NWTRC. When the minefield is installed, submarine crews will use the AN/BQS-15 high frequency active sonar to locate and avoid the mine shapes. Each mine avoidance exercise involves one submarine operating the AN/BQS-15 sonar for six hours to navigate through the training minefield. A total of seven mine avoidance exercises will occur in the NWTRC annually.

2.6.3 Range Activity Summary Tables

Tables 2-7 through 2-10 summarize the activities in the NWTRC. Table 2-7 summarizes the resulting impact to training from each of the NWTRC enhancements. Table 2-8 lists the active sonar sources in use or proposed for use in the NWTRC. Table 2-9 provides detailed information on each of the Baseline, Alternative 1, and Alternative 2 activities. Table 2-10 lists the annual expenditure of ordnance and other related training materials in the NWTRC.

Table 2-7: Impact of Range Enhancements on Annual Level of Activities

Range Activity	Platform	Before Range Enhancement	After Range Enhancement	% Increase due to Range Enhancement
New Electronic Combat (EC) Threat Simulators/Targets				
Electronic Combat (EC) Exercises	EA-6B/EA-18G	2,290 events	4,580 events	100%
	P-3	14 events	28 events	100%
	EP-3	195 events	390 events	100%
	CVN	0 events	50 events	N/A
	DDG	0 events	50 events	N/A
	FFG	0 events	100 events	N/A
	AOE	0 events	25 events	N/A
	SSGN	0 events	25 events	N/A
	SSBN	0 events	25 events	N/A
New Portable Undersea Tracking Range (PUTR)				
Anti-Submarine Warfare Tracking Exercise – Surface Ship	DDG (SQS-53C)	39 sonar hours	43 sonar hours	10%
	FFG SQS-56)	59 sonar hours	65 sonar hours	10%
New Air Target Services				
Air-to-Air (A-A)Missile Exercise	EA-18G	12 events 15 missiles	24 events 30 missiles	100%

Table 2-7: Impact of Range Enhancements on Annual Level of Activities (continued)

Range Activity	Platform	Before Range Enhancement	After Range Enhancement	% Increase due to Range Enhancement
Surface-to-Air (S-A) Gunnery Exercise	DDG	19	38	100%
	FFG	57	113	98%
	AOE	4	9	125%
S-A Missile Exercise	CVN	0	4	N/A
New Surface Target Services				
Surface-to-Surface (S-S) Gunnery Exercise	CVN	4 events	8 events	100%
	DDG	23 events	42 events	83%
	FFG	70 events	126 event	80%
	AOE	2 events	4 events	100%
Small Scale Underwater Training Minefield				
Mine Avoidance	SSGN	0 events	4 events 24 sonar hours	N/A
	SSBN	0 events	3 events 18 sonar hours	N/A

Table 2-8: Active Sonar Systems and Platforms

System	Frequency	Associated Platform/Use	Annual Use (Alt. 2)
AN/SQS-53C	MF	DDG and CG hull-mounted sonar	43 hours
AN/SQS-56	MF	FFG hull-mounted sonar	65 hours
AN/BQS-15	HF	Submarine mine detection sonar	42 hours
Range Uplink Transducer	MF / HF	Portable Undersea Tracking Range	150 hours
MK-84 Range Tracking Pingers	HF	Ships, submarines, ASW targets	180 hours
MK-48 Torpedo	HF	Submarine fired exercise torpedo (used during SINKEX)	2 runs
Tonal sonobuoy (DICASS) (AN/SSQ-62)	MF	MPA deployed	886 sonobuoys
Tonal sonobuoy (AEER) (AN/SSQ-125)	MF	MPA deployed	149 sonobuoys

CG – Guided Missile Cruiser; DDG – Guided Missile Destroyer; DICASS – Directional Command-Activated Sonobuoy System; HF – High-Frequency; MF – Mid-Frequency.

Table 2-9: Current and Proposed Annual Level of Activities

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
ANTI-AIR WARFARE (AAW)						
Aircraft Combat Maneuvers	EA-6B	Chaff	1,353 events	2,000 events	2,000 events	Offshore Area, Inshore Area
	EA-18G*					
	FA-18					
	F-16					
Air-to-Air (A-A)Missile Exercise (*, **)	EA-18G	AIM-7 Sparrow	0 events 0 missiles	12 events 15 missiles	24 events 30 missiles	Offshore Area
		AIM-9 Sidewinder				
		AIM-120 AMRAAM				
Surface-to-Air (S-A) Gunnery Exercise (**)	DDG	5"/54 BLP, 20mm CIWS	72 events	80 events	160 events	Offshore Area
	FFG	76mm, 20mm CIWS				
	AOE	20mm CIWS				
S-A Missile Exercise*	CVN	Sea Sparrow Missile or RAM	0 events	0 events	4 events	Offshore Area
ANTI-SURFACE WARFARE (ASUW)						
Surface-to-Surface (S-S) Gunnery Exercise (**)	CVN	20mm CIWS, 7.62mm, .50 cal	4 events	4 events	8 events	Offshore Area
	DDG	5"/54 BLP, 20mm, 7.62mm, .50 cal	21 events	23 events	42 events	
	FFG	76mm, 20mm, 7.62mm, .50 cal	63 events	70 events	126 event	
	AOE	20mm, 7.62mm, .50 cal	2 events	2 events	4 events	
Air-to-Surface (A-S) Bombing Exercise (**)	P-3C	MK-82 (live), BDU-45 (inert)	24 events	30 events	30 events	Offshore Area
	P-8*	MK-82 (live), BDU-45 (inert)				
HARM Exercise	EA-6B	CATM-88C (not released)	See STW	See STW	See STW	Offshore Area, Inshore Area
	EA-18G*	CATM-88C (not released)				
Sink Exercise (**)	E-2	None	1 event	2 events	2 events	Offshore Area
	P-3	MK-82, AGM-65 Maverick				
	FA-18	MK-82, MK-83, MK-84, SLAM-ER				
	EA-6B	AGM-88C HARM				
	EA-18G*	AGM-88C HARM				
	SH-60	AGM-114 HELLFIRE				
	DDG	5"/54				
	FFG	76mm				
	SSN	MK-48 ADCAP				

Table 2-9: Current and Proposed Annual Level of Activities (continued)

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
ANTI-SUBMARINE WARFARE (ASW)						
Anti-Submarine Warfare (ASW) Tracking Exercise - MPA	P-3C	Targets: SSN, MK-39 EMATT Sonobuoys: SSQ-53 DIFAR (passive) SSQ-62 DICASS (active) SSQ-77 VLAD, SSQ-36 BT, SSQ-125 AEER	200 events	205 events	210 events	Offshore Area
	P-8 MMA*					
ASW Tracking Exercise - Extended Echo Ranging (EER)	P-3C	SSQ-110A source sonobuoy SSQ-77 VLAD	10 events	11 events	12 events	Offshore Area
	P-8 MMA*					
ASW Tracking Exercise - Surface Ship	DDG	SQS-53C MFA sonar	24 events 36 sonar hours	26 events 39 sonar hours	26 events 43 sonar hours	Offshore Area
	FFG	SQS-56 MFA sonar	36 events 54 sonar hours	39 events 59 sonar hours	39 events 65 sonar hours	
ASW Tracking Exercise - Submarine	SSBN	BQQ-5 (passive only)	96 events	100 events	100 events	Offshore Area
	SSGN	BQQ-5 (passive only)				
ELECTRONIC COMBAT (EC)						
Electronic Combat (EC) Exercises	EA-6B/EA-18G	None	2,135 events	2,290 events	4,580 events	Offshore Area, Inshore Area
	P-3		13 events	14 events	28 events	
	EP-3		182 events	195 events	390 events	
	CVN**		0 events	0 events	50 events	
	DDG**		0 events	0 events	50 events	
	FFG**		0 events	0 events	100 events	
	AOE**		0 events	0 events	25 events	
	SSGN**		0 events	0 events	25 events	
	SSBN**		0 events	0 events	25 events	
MINE WARFARE (MIW)						
Mine Countermeasures (**)	EOD Pers. H-60, RHIB	2.5 lb C-4	60 events 60 detonations 878 pers.	4 events 4 detonations 102 pers.	4 events 4 detonations 102 pers.	Inshore Area, (EOD Ranges)
Land Demolitions (**)	EOD Pers. Truck	C-4, various igniters, fuses, smoke grenades	102 detonations	110 detonations	110 detonations	Inshore Area, (EOD Ranges)

Table 2-9: Current and Proposed Annual Level of Activities (continued)

Range Activity	Platform	System or Ordnance	No Action Alternative	Alternative 1	Alternative 2	Location
MINE WARFARE (MIW) (continued)						
Mine Avoidance*	SSGN (1 per event)	AN/BQS-15 HFA Sonar	0 events	0 events	4 events 24 sonar hours	Offshore Area
	SSBN (1 per event)	AN/BQS-15 HFA Sonar	0 events	0 events	3 events 18 sonar hours	
NAVAL SPECIAL WARFARE (NSW)						
Insertion/Extraction	C-130 (1 sortie per event)	None	24 events	27 events	27 events	Inshore Area, EOD Ranges
	H-60 (1 sortie per event)		84 events	93 events	93 events	
	Personnel		1,064 pers.	1,160 pers.	1,160 pers.	
NSW Training	SDV (1 per event)	None	35 events	35 events	35 events	Indian Island
	RHIB (2 per event)		35 events	35 events	35 events	
	NSW Pers.		245 pers.	245 pers.	245 pers.	
STRIKE WARFARE (STW)						
HARM Exercise (Non-firing)	EA-6B, EA-18G*	CATM-88C (not released)	2,724 events	3,000 events	3,000 events	Offshore Area, Inshore Area
SUPPORT Activities						
Intelligence, Surveillance, and Reconnaissance (ISR)	P-3, EP-3, EA-6B, EA-18G*	None	94 events	100 events	100 events	Offshore Area
Unmanned Aerial System(UAS) Research, Development, Test and Evaluation (RDT&E) and Training	Scan Eagle, Global Hawk*, BAMS*	None	12 events	112 events	112 events	Offshore Area, Inshore Area

Notes: * This activity, ordnance, or location is only applicable under Alternative 1 or 2.
** This activity may involve the use of explosive ordnance.

Table 2-10: Annual Ordnance and Expendables Use

Training Area and Ordnance/Expendable Type	Number of Rounds/Expendables Per Year		
	No Action	Alternative 1	Alternative 2
Pacific Northwest Ocean Surface/Subsurface Operating Area (PACNW OPAREA)			
BOMBS			
BDU-45 (Inert)	88	110	110
MK-82 High Explosive (HE)	12	18	18
MK-83 (HE)	4	8	8
MK-84 (HE)	4	8	8
MISSILES			
AIM-7 Sparrow (Inert and HE)	0	6	13
AIM-9 Sidewinder (Inert and HE)	0	5	9
AIM-120 AMRAAM (Inert and HE)	0	4	7
AGM-65 Maverick (HE)	3	6	6
AGM-84 Harpoon (HE)	3	6	6
AGM-88 HARM (HE)	2	4	4
AGM-114 HELLFIRE (HE)	1	2	2
NATO Sea Sparrow Missile (Inert and HE)	0	0	8
SLAM ER (HE)	1	2	2
NAVAL GUNSHELLS			
20 mm (Inert)	7,200	8,000	16,000
25 mm (Inert)	15,750	17,500	31,500
57mm (Inert)	630	700	1,260
76mm (Inert and HE)	560	800	1,120
5 inch (Inert and HE)	1,716	2,351	3,463
SMALL ARMS ROUNDS (All inert)			
7.62mm Projectile	1,224	1,360	2,720
.50 cal machine gun	58,500	65,000	117,000
TORPEDOES			
MK-48 ADCAP (HE)	1	2	2
PYROTECHNICS			
LUU-2B/B Flare	0	6	11
MK-58 Marine Marker (Day/Night smoke/flare)	208	215	220
TARGETS (No explosives)			
MK-39 Expendable Mobile ASW Training Target (EMATT)	121	126	126
Tactical Air Launched Decoy (TALD)	0	11	22
TDU-34 Towed Target (Retained, not expended)	72	80	160
BQM-74E (Recoverable)	0	0	16
HSMST (Recovered)	0	5	9
RR-129 Chaff	3,000	6,000	6,000

Table 2-10: Annual Ordnance and Expendables Use (continued)

Training Area and Ordnance Type	Number of Rounds Per Year		
	No Action	Alternative 1	Alternative 2
Pacific Northwest Ocean Surface/Subsurface Operating Area (PACNW OPAREA) (continued)			
TARGETS (continued)			
Trimaran (Recovered)	0	11	20
SPAR (Recovered)	0	17	31
Killer Tomato (Recovered)	60	67	120
SONOBUOYS			
SSQ-36 BT (Nonacoustic)	288	295	302
SSQ-53 DIFAR (Passive Acoustic)	7,283	7,503	7,661
SSQ-62 DICASS (Active Acoustic)	844	865	886
SSQ-77 VLAD (Passive Acoustic)	593	623	653
SSQ-110A Source (Explosive) / SSQ-125 AEER (Active Acoustic)	124	136	149
Indian Island Underwater EOD Range			
EXPLOSIVES			
2.5 lb Net Explosive Weight (NEW) charges	3	1	1
20 lb NEW charges	1	0	0
Crescent Harbor Underwater EOD Range			
EXPLOSIVES			
< 2.5 lb NEW charges	3	0	0
2.5 lb NEW charges	45	2	2
5 lb NEW charges	1	0	0
20 lb NEW charges	4	0	0
Floral Point Underwater EOD Range			
EXPLOSIVES			
2.5 lb NEW charges	3	1	1
Seaplane Base Demolition Training Range			
EXPLOSIVES			
Detasheet C-2 (0.083 in)	800	862	862
C-4 1.25 lb block	1,476	1,591	1,591
C-4 2.0 lb block	240	259	259
Igniters	160	172	172
MK142 Firing Device	91	98	98
Hand Grenades	160	172	172
MK174 Ctg Cal .50 Impulse	847	913	913
DetaSheet 2.0 lb (M024)	240	259	259
Blasting Cap, Electric (M130)	1,758	1,896	1,896
Det Cord (ft) (M456)	31,960	34,467	34,467
Fuse, Blasting,Time (ft) (M670)	16,300	17,578	17,578

Table 2-10: Annual Ordnance and Expendables Use (continued)

Training Area and Ordnance Type	Number of Rounds Per Year		
	No Action	Alternative 1	Alternative 2
Seaplane Base Demolition Training Range (continued)			
EXPLOSIVES (continued			
Igniter, Time, Blasting Fuse (M766)	320	345	345
Blasting Cap, Non-Electric (M131)	959	1034	1034
PYROTECHNICS			
Red Smoke, G950	224	241	241
Green Smoke, G940	91	98	98
Violet Smoke, G955	192	207	207
Bangor Demolition Training Range			
EXPLOSIVES			
Detasheet C-2 (0.083 in)	50	55	55
C-4 1.25 lb block	94	102	102
C-4 2.0 lb block	15	16	16
Igniters	10	11	11
MK142 Firing Device	6	6	6
Hand Grenades	10	11	11
MK174 Ctg Cal .50 Impulse	54	58	58
DetaSheet 2.0 lb (M024)	15	17	17
Blasting Cap, Electric (M130)	112	121	121
Det Cord (ft) (M456)	2,040	2,200	2,200
Fuse, Blasting,Time (ft) (M670)	1,040	1,122	1,122
Igniter, Time, Blasting Fuse (M766)	20	22	22
Blasting Cap, Non-Electric (M131)	61	66	66
PYROTECHNICS			
Red Smoke, G950	14	15	15
Green Smoke, G940	6	6	6
Violet Smoke, G955	12	13	13

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