

CHAPTER 4

CUMULATIVE IMPACTS AND IRREVERSIBLE / IRRETRIEVABLE COMMITMENT OF RESOURCES

4.1 CUMULATIVE IMPACTS

4.1.1 Analysis of Cumulative Impacts

The analysis of cumulative impacts (or cumulative effects)¹ follows the objectives of the National Environmental Policy Act (NEPA) of 1969 and Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations [CFR] §§ 1500-1508) that provide the implementing procedures for NEPA. The CEQ regulations define “cumulative effects” as:

“ . . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” (40 CFR 1508.7).

The CEQ also provides guidance on cumulative impacts analysis in *Considering Cumulative Effects Under the National Environmental Policy Act* (CEQ 1997). Noting that environmental impacts result from a diversity of sources and processes, this CEQ guidance observes that “no universally accepted framework for cumulative effects analysis exists,” while noting that certain general principles have gained acceptance. One such principal provides that “cumulative effects analysis should be conducted within the context of resource, ecosystem, and community thresholds—levels of stress beyond which the desired condition degrades.” Thus, “each resource, ecosystem, and human community must be analyzed in terms of its ability to accommodate additional effects, based on its own time and space parameters.” Therefore, cumulative effects analysis normally will encompass geographic boundaries beyond the immediate area of the Proposed Action, and a time frame including past actions and foreseeable future actions, in order to capture these additional effects. Bounding the cumulative effects analysis is a complex undertaking, appropriately limited by practical considerations. Thus, CEQ guidelines observe, “[i]t is not practical to analyze cumulative effects of an action on the universe; the list of environmental effects must focus on those that are truly meaningful.”

For the purposes of assessing cumulative impacts, the Navy reviewed all relevant and available environmental documentation pertaining to projects considered in the cumulative impacts analysis. The level of information available for the different cumulative projects is variable, and the best available data are used in the analysis. In addition, NMFS and USFWS reviewed the status of listed species and the environmental baseline of these species, as well as cumulative effects, in their respective Biological Opinions that resulted from the Navy’s consultation under section 7 of the Endangered Species Act.

4.1.2 Geographic Boundaries for Cumulative Impacts Analysis

Geographic boundaries for analyses of cumulative impacts in this EIS/OEIS vary for different environmental resources. For example, for air quality, the potentially affected air basin is the appropriate

¹ CEQ Regulations provide that the terms “cumulative impacts” and “cumulative effects” are synonymous (40 CFR § 1508.8(b)).

boundary for assessment of cumulative impacts from releases of pollutants into the atmosphere. For resources such as fish or marine mammals, impacts from the Proposed Action might combine with impacts from distant sources to affect the resource species, necessitating a wider geographic scope for the analysis. Table 4-1 identifies the geographic scope of this cumulative impacts analysis, by resource area.

The analysis of cumulative effects may go beyond the scope of project specific direct and indirect effects to include expanded geographic and temporal boundaries and a focus on broad resource sustainability. This “big picture” approach is becoming increasingly important as growing evidence suggests that the most significant effects result not from the direct impacts of a specific action, but from the combination of individual, often minor, effects of multiple actions over time. The underlying concern is whether or not a particular resource can recover from the effects of an action before the environment is exposed to a subsequent action or actions.

Table 4-1 Geographic Areas for Assessment of Cumulative Impacts

Resource	Area for Impacts Analysis
Terrestrial Wildlife	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Marine Flora and Invertebrates	Liberty Bay, Port Orchard Reach, Hood Canal, Dabob Bay, and Pacific Ocean off the coast of Jefferson County, including OCNMS and W-237 portion of offshore OPAREA
Sea Turtles	Liberty Bay, Port Orchard Reach, Hood Canal, Dabob Bay, and Pacific Ocean off the coast of Jefferson County, including OCNMS and W-237 portion of offshore OPAREA
Fish	Liberty Bay, Port Orchard Reach, Hood Canal, Dabob Bay, and Pacific Ocean off the coast of Jefferson County, including OCNMS and W-237 portion of offshore OPAREA
Marine Mammals	Liberty Bay, Port Orchard Reach, Hood Canal, Dabob Bay, and Pacific Ocean off the coast of Jefferson County, including OCNMS and W-237 portion of offshore OPAREA
Sediments and Water Quality	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Cultural Resources	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Recreation	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Land and Shoreline Use	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Public Health and Safety and Environmental Hazards to Children	Keyport Range, DBRC and QUTR Sites and Immediate Vicinity
Socioeconomics and Environmental Justice	Kitsap, Jefferson, Grays Harbor, and Mason Counties
Air Quality	PSCAA and ORCAA air basin jurisdictions

4.1.3 Past, Present, and Reasonably Foreseeable Future Actions

Identifiable effects of past actions are analyzed and evaluated to the extent they may be additive to impacts of the Proposed Action. In general, the Navy need not list or analyze the effects of individual past actions; cumulative impacts analysis appropriately focuses on aggregate effects of past actions. Reasonably foreseeable future actions that may have impacts additive to the effects of the Proposed Action are also analyzed. As part of the evaluation of cumulative impacts, a review of other projects in the vicinity of each of the three range sites was conducted. Table 4-2 provides a summary of the projects, indicating the approximate timeframe of each project. Other categories of ongoing (past, present, and reasonably foreseeable future) human activities that encompass multiple “actions” or “projects” by

government or other entities (e.g., community development, commercial and other fishing or boating activities, scientific studies, port and commercial shipping operations, etc.), were also considered as potential contributors to cumulative effects on environmental resources.

Table 4-2 Cumulative Projects near the NAVSEA NUWC Keyport Range Complex

<i>Cumulative Projects by Range Site</i>	<i>Timeframe</i>		
	<i>Past</i>	<i>Present</i>	<i>Future</i>
Keyport Range Site			
A – Undersea Weapons Systems Dependability Center	X		
B – Shoreline Construction	X	X	X
C – Keyport Lagoon Habitat Enhancement			X
DBRC Site			
A – Naval Surface Warfare Center Det Bremerton Command Consolidation		X	
B – Underwater Surveillance System	X		
C – Submarine Development Squadron Detachment FIVE Support Facilities	X		
D – Fred Hill Materials Gravel Project			X
E – Hood Canal Bridge Replacement and Retrofit		X	
F – Point Whitney Boat Ramp Upgrade			X
G – Hood Canal Dissolved Oxygen Program	X	X	X
H – Jefferson County Black Point Master Planned Resort Proposal			X
I – Swimmer Interdiction Security System, Naval Base Kitsap-Bangor		X	
J – Transit Protection System Facilities, Naval Base Kitsap-Bangor			X
K – Waterfront Restricted Area Land/Water Interface, Naval Base Kitsap-Bangor			X
L – Trident Support Facilities Explosives Handling Wharf			X
QUTR Site			
A – Deep Sea Corals Study	X	X	X
B – Washington Island NWR Comprehensive Conservation Plan	X		
C – NWTRC Activities	X	X	X
D – Other Categories of Activities (Research, Boating, Coastal Development)	X	X	X

4.1.3.1 Keyport Range Site

A – Undersea Weapons Systems Dependability Center

NUWC Keyport operates the Undersea Weapons Systems Dependability Center which provides the Fleet, system developers and acquisition managers with a Center for testing, validating, and assuring the dependability of next-generation undersea warfare vehicles, weapons, and systems. The 25,910 ft² (2,407.1 m²) facility completed in 2006 is located in the industrial area of NUWC Keyport. The facility provides connectivity and real-time integration of in-situ range performance data with undersea battle space labs; multiple test and training ranges; Fleet submarine and air and surface units worldwide, and some engineering labs.

B – Shoreline Construction

The shoreline of Liberty Bay, Port Orchard Reach, and Hood Canal has been and continues to be subject to development by property owners. Over the past 5 years, an average of 15 shoreline development permits (Joint Aquatic Resource Permit Applications) per year have been applied for by property owners within the cumulative effects region. These actions (e.g., pier/dock construction, shoreline stabilization, stairways/beach access, shoreline construction, submarine cable installation, septic system failures) are

likely to continue to occur within the cumulative effects region at the same pace (i.e., approximately 15 per year) over the next several years.

C – Keyport Lagoon Habitat Enhancement

As part of the WDOE water quality certification process for maintenance wharf replacement actions at Puget Sound Naval Shipyard, a mitigation opportunity was proposed by WDOE to restore a more natural flow of tidal influences between Puget Sound (Liberty Bay) and Keyport Lagoon. The mitigation opportunity at Keyport would return the 24-acre brackish lagoon to a saltwater marsh and intertidal mudflat by removing the concrete sill structure and 40-foot bridge on Bushnell Drive and installing two 42-foot span arch culverts. Implementing this mitigation would restore the habitat structure and function of Keyport Lagoon back to those of a Puget Sound tidal marsh habitat. The salinity of the lagoon would closely match that of Port Orchard Bay during high tide, with streams entering the lagoon supporting a lower salinity as the tide recedes.

4.1.3.2 DBRC Site

A – Naval Surface Warfare Center, Detachment Bremerton Command Consolidation

This action consolidates Naval Surface Warfare Center, Carderock Division Detachment Bremerton activities at Fox Island Laboratory and Detachment Bremerton to Naval Base Kitsap-Bangor in Silverdale, Washington. The project consists of constructing in-water facilities on Carlson Spit, including a new access pier and associated mooring components (e.g., dolphins, anchoring systems). The new pier supports a pontoon with two prefabricated buildings, the M241 barge, the Range Crane Barge, and several small motorized vessels and skiffs. The existing Carlson Spit Access Road is being improved and short-term parking and loading/unloading space is being provided at the base of the new access pier. In addition to the in-water facilities, a new structure, called the Office/Laboratory Building, is being constructed in an area just east of Sealion Road. Approximately 5 acres (2.0 ha) of mature forest are being removed to provide office and laboratory space for approximately 70 scientists and engineers and parking for approximately 100 vehicles. Construction of this project began in Spring 2007 with a project completion date scheduled for Fall 2008.

B – Underwater Surveillance System

The Navy installed an active-acoustic Underwater Surveillance System within the designated Restricted Area at Naval Base Kitsap-Bangor. The purpose of this project was to improve the underwater detection capabilities at Naval Base Kitsap-Bangor to comply with current Navy directives regarding base security. The system operates at the same frequency and range as a commercial “fish finder” and is in operation full time. The system was installed and operational as of April 2006.

C – Submarine Development Squadron FIVE Detachment Support Facilities

The Navy implemented upgrades to waterfront and shore-based support facilities for its Submarine Development Squadron FIVE Detachment at Submarine Base Bangor (now called Naval Base Kitsap-Bangor). These upgrades were completed in July 2005. Anticipated levels of mission support, and the operational tempo of assigned submarines, require additional shore-side buildings for administration, operations, industrial, and support functions. Security requirements and operational efficiency dictate consolidation of off-base contractor space onto a contiguous site adjacent to the Shore-based Support Facility.

D – Fred Hill Materials Gravel Project

Fred Hill Materials, a materials supply firm based in Poulsbo, is proposing construction of a 4-mi (~6-km) conveyor belt connecting a 781-acre (316-ha) inland gravel mine to a 1,100-ft (335-m) long, 80-ft (24-m) high pier and 900-ft (274-m) long moorage dock. The shipping facility would be on the west shore of Hood Canal, 5 mi (8 km) south of the Highway 104 Hood Canal Bridge. When fully operational, the “pit to pier” operation would mine, transport, and ship an estimated 60,000 tons (54,432 metric tons) of gravel 24 hours per day, loading into barges and ships bound for domestic and foreign ports. Each vessel would travel under or through the opening of the floating Hood Canal Bridge. The company (action proponent) has begun the process of applying for permits. Under the Washington State Environmental Policy Act, an EIS public scoping meeting was held on September 27, 2007 and an EIS is in progress.

E – SR-104 Hood Canal Bridge East-half Replacement and West-half Retrofit Project

The eastern half of the Hood Canal Bridge, located between Kitsap and Jefferson counties at the northern mouth of Hood Canal, is nearing the end of its structural service life. From the extent of cracking and damage caused by past major storms, the remaining service life of the bridge has been reduced. An EA and Supplemental EA were prepared for the project and a FONSI issued in May 2002; construction began in 2006. When completed, the Hood Canal Bridge will have a new, wider, floating section, new approach sections, and transition trusses on the east and west ends. In addition, the western half that was rebuilt after it sank during a 1980 storm will be widened to allow for continuous 8-ft (2.4-m) shoulders across the entire length of the bridge. The east-half of the replacement is scheduled to be completed in summer 2009, and west-half retrofitting is scheduled to be completed by December 2010.

F – Point Whitney Boat Ramp Upgrade

The Washington Department of Fish and Wildlife (WDFW) proposes to expand the existing public boat launch to better accommodate recreational boating access to Dabob Bay. The existing 10-ft (3-m) wide ramp would be widened to 12 ft (4 m) and extended 22 ft (7 m) beyond the end of the existing ramp to a total length of 132 ft (40 m). The existing ramp is 12 to 14 in (31-36 cm) thick. The replacement ramp would be 6 in (15 cm) thick. Potential impacts were identified for Pacific herring and epibenthic organisms and infauna that utilize eelgrass habitat in the boat ramp area. Mitigation measures were outlined in the Final State Environmental Policy Act (SEPA) documentation, dated November 3, 2004, and an addendum to Determination of Non-Significance was signed on September 15, 2005.

G – Hood Canal Dissolved Oxygen Program (HCDOP)

The Hood Canal Dissolved Oxygen Program was created to address the historically low DO situation and the effect on marine life. The Program is a partnership of 28 organizations that works with local, state, federal, and Tribal government policy makers to evaluate potential corrective actions that will restore and maintain DO to reduce stress to marine life. A three-year Integrated Assessment and Modeling Study was conducted from 2005-2007 to use marine, freshwater and biota monitoring data and a computer model to quantify the role the various natural processes and human actions are playing to control the concentrations of DO in Hood Canal and to test corrective action scenarios. Ongoing activities include education and outreach, working with policy makers, monitoring water quality, responding to fish kills and algal blooms, and using modeling to evaluate potential corrective actions.

H – Jefferson County Black Point Master Planned Resort

The Statesman Group of Companies, LTD, and Black Point Properties, LLC, have submitted an application for a Master Planned Resort in the Black Point area called the Pleasant Harbor Marina and

Golf Resort on the shore and uplands near Brinnon and the Navy Range at Dabob Bay. The project consists of 253 acres (102 ha), a marina with 290 slips, minor commercial facilities, an 18-hole golf course, and 1,090 residential units designed to serve the visiting public through a “condotel” program, with individual units privately owned but managed as a resort. Also at issue is the likelihood of the resort exchanging property with the Department of Fisheries to enable the construction of a new boat ramp, which would be open to the public. The document addressed potential impacts to shellfishing, water quality, transportation, public services, shorelines, fish and wildlife, rural character, archaeological and cultural resources, and critical areas. A FEIS was published in November 2007 and was included as part of the 2007 Comprehensive Plan Amendment Cycle. The Board of County Commissioners approved the proposal in January 2008.

I – Swimmer Interdiction Security System, Naval Base Kitsap-Bangor

The Navy has proposed to implement a Swimmer Interdiction Security System to meet special U.S. government security requirements for military installations in response to the terrorist attacks of September 11, 2001. The system would protect waterside Navy assets and sailors and would remain in operation as long as valuable naval assets are located at Naval Base Kitsap-Bangor. The Navy examined various alternatives for implementing the system: marine mammals (preferred alternative), combat swimmers, and remotely operated vehicles. Under the preferred alternative, specially trained marine mammals and their human teammates would respond rapidly to security alerts by detecting, classifying, and marking the location of underwater objects or interdicting intruders. Humans would work aboard small power boats and marine mammals would be in enclosures. A Draft EIS was made available to the public for comment in December 2008, with a Record of Decision anticipated for Winter 2009.

J – Transit Protection System Facilities, Naval Base Kitsap-Bangor

This project is being addressed in an EIS for Naval Base Kitsap-Bangor waterfront projects. This project is to provide berthing for three types of Transit Protection System vessels and various Port Operations tugs and small craft. In addition, the project will provide the necessary support facilities ashore for the command, administrative, operations, and support functions of the crews and command personnel of associated escort vessels and craft. The project involves the demolition of an existing pier and the installation of piles for the new pier, as well as construction of new facilities. The pier will be located at the site of the existing Magnetic Silencing Facility (MSF). The existing MSF and associated support facilities will be demolished. The proposed development involves several potentially significant issues, including endangered and threatened species, stormwater runoff, demolition material disposal, and the avoidance of impacts to valuable upland natural resources. This project is scheduled to occur in FY11.

K – Waterfront Restricted Area (WRA) Land/Water Interface (LWI), Naval Base Kitsap-Bangor

This project is being addressed in an EIS for Naval Base Kitsap-Bangor waterfront projects. This project is to provide security upgrades to the existing Naval Base Kitsap-Bangor WRA by constructing two WRA LWI Barriers, which connect both ends of the WRA enclave to the existing floating barriers. The LWIs will extend from the high water mark to the terminations of the Port Security Barriers (PSB) and will be capable of moving in the full tide range and providing an anchorage for the floating barriers. The project consists of two separate construction features. The first is the delay system, which connects the high tide termination with the existing PSB to prevent entry of the current postulated threat vehicle. The second is construction of the sensor equipment that will provide detection. This project is scheduled to occur in FY12.

L – Trident Support Facilities Explosive Handling Wharf

As part of its strategic deterrence mission, the Navy is proposing to build a second explosives handling wharf adjacent to, but separate from, the existing wharf at Naval Base Kitsap-Bangor. The preferred alternative, the Deep-Water Trestle Alternative, would comprise a covered operations area, warping wharf and access trestles built parallel to and approximately 600 feet (183 m) from shore, away from the intertidal zone to the extent possible. The construction of wharves and trestles for the preferred alternative could require up to 2,600 piles. Potential impacts of the Proposed Action and alternatives are being addressed in an EIS being prepared by the Navy.

4.1.3.3 QUTR Site

A – Deep Sea Corals Study

Scientists from the National Center for Coastal Ocean Science and the Olympic Coast National Marine Sanctuary (OCNMS) have initiated a study of deep sea coral/sponge assemblages at the OCNMS and their potential vulnerability to anthropogenic activities in the area. The project began in June 2004 with a pilot survey. A follow-up survey was conducted from May 22 to June 4, 2006 to explore other areas of the sanctuary looking for communities of deepwater corals and sponges. The Remotely Operated Platform for Ocean Science traveled over the seafloor 1 and 20 mi (1.6 to 32 km) from shore in the OCNMS at depths ranging from 300 to 2,000 ft (91.4 to 609.6 m) (Hyland et al. 2005; Brancato et al. 2007). Future efforts will seek to explore the remaining uncharacterized habitats.

B – Washington Islands NWR Comprehensive Conservation Plan

In 2007, the USFWS completed a Final Comprehensive Conservation Plan to guide its management and resources within the Flattery Rocks NWR, Quillayute Needles NWR, and Copalis NWR over the next 15 years (USFWS 2005b). Located along the Olympic Peninsula on the outer coast of Washington, these three NWRs are collectively called the Washington Islands NWR. A management plan for the Washington Islands NWR was prepared by the USFWS in 1986 and revised in 1989.

C – Northwest Training Range Complex Ongoing and Proposed Navy Training Activities

A wide variety of military training activities are conducted in the W-237 operating areas west of Washington, including training exercises in anti-air, anti-surface, and anti-submarine warfare; electronic combat exercises, mine countermeasures training; naval special warfare training; and various support operations. The Navy has developed policies and procedures to avoid harm and to minimize the effects of Navy training on terrestrial and marine species and habitats. The Navy is currently preparing an EIS/OEIS to assess effects of ongoing and potential future training activities in the Northwest Training Range Complex; the Draft EIS/OEIS was made available to the public in December 2008 and the ROD is anticipated in Fall 2009. Three alternatives (No-Action and two action alternatives) were assessed in the Draft EIS/OEIS. The marine mammal active sonar impact analysis presented in the Draft EIS/OEIS estimated more than 117,000 annual exposures potentially resulting in behavioral harassment of marine mammals and 480 annual exposures exceeding the TTS threshold.

D – Other Categories of Activities

In addition to the projects mentioned above, there are numerous ongoing activities that overlap the proposed QUTR site expansion and proposed activities therein. These include but are not limited to:

- Research studies and monitoring related to oceanographic conditions, fisheries, and cetaceans. This includes work conducted by government and academic scientists, Tribes and Nations, and

the Navy. In general, these activities entail localized and minimal disturbance of natural resources but have long-term benefits.

- Fishing and boating throughout the OCNMS. Potential cumulative effects in the future have been diminished by the OCNMS' requiring that large vessel traffic be routed around the sanctuary, and by the regulation by NOAA Fisheries and the Pacific Marine Fisheries Council of destructive fishing activities, especially the designation of large areas as off-limits to bottom trawling. Derelict gear (lost or discarded nets, crab pots) is associated with other types of fishing and can impact benthic communities and pose entanglement hazards.
- Coastal community development along the Olympic coast. Development, e.g., in the Moclips area, results in a variety of incremental effects on coastal resources, especially recreational use of the immediate shoreline. Interaction and potential cumulative impacts with those of the Proposed Action, however, is unlikely because of the small and temporary effects of the proposed surf zone activities.

4.1.4 Impacts

This section summarizes the evaluation of cumulative effects associated with the Proposed Action in combination with the projects identified above in Table 4-2 and other ongoing activities in the marine environment in and around the Keyport Range, DBRC, and QUTR sites. Since environmental analyses for some of the projects listed are not complete or do not include quantitative data, cumulative impacts are addressed qualitatively.

4.1.4.1 Keyport Range Site

Terrestrial Wildlife

As described in Section 3.1, implementation of the Proposed Action at the Keyport Range Site would have minimal effects on terrestrial wildlife, including ESA-listed species. The Proposed Action does not involve any land or shoreline construction activities, and its effects on terrestrial species would be limited to localized, temporary disturbances to wildlife occurring during in-water RDT&E and other NUWC Keyport managed activities. In conjunction with non-military activities on the water, especially recreational boating and fishing, there is some potential for cumulative disturbance to wildlife. Continued adherence to the requirements of EO 13186 and the Bald and Golden Eagle Protection Act (16 USC 668a-d dated June 8 1940 as twice amended) by NUWC Keyport would limit disturbance to migratory birds and ensure that important habitats do not become degraded. Existing regulatory mechanisms would protect bald eagles and the ESA-listed marbled murrelet (Section 3.1) and potential cumulative impacts to these species would not be significant when added to other projects considered in the cumulative analysis.

Non-federal shoreline construction activities as listed in Table 4-2 that may occur in Liberty Bay and the Port Orchard Reach could cause temporary and potentially permanent shoreline impacts. The temporary impacts are directly and indirectly associated with shoreline construction activities while the more permanent impacts are associated with potential pier/dock and shoreline stabilization. These are state-approved projects that are consistent with the Washington SMA. The incremental impact of adding the effects of the Proposed Action to these projects would not result in significant cumulative impacts on terrestrial wildlife.

Marine Flora and Invertebrates

Implementation of the Proposed Action, when considered in combination with the projects listed in Section 4.1.3 and other anthropogenic activities, would have negligible cumulative effects on marine flora and invertebrates. Some of the projects (e.g., shoreline construction), as well as other anthropogenic activities such as commercial and recreational harvesting of bivalves, would have temporary direct and indirect impacts on marine flora and invertebrates due to the suspension of sediments and short-term increases in turbidity within the water column in the nearshore environments where the activities occur. Continuing management of populations of commercially and recreationally important invertebrates, such as the geoduck, by the WDFW would limit the potential for cumulative effects of harvesting. The Proposed Action would have a negligible contribution to benthic habitat disturbance (e.g., from expended materials) or water quality effects such as turbidity, such that no adverse long-term, permanent impacts to populations of marine flora and invertebrates are expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine flora and invertebrates would occur.

Sea Turtles

Sea turtles do not occur at the Keyport Range Site. Therefore, no cumulative impacts to sea turtles would occur.

Fish

As described in Section 3.4.2, implementation of the Proposed Action at the Keyport Range Site would have minimal effects on marine fish and their habitat, including EFH and ESA-listed species. When considered in conjunction with the cumulative projects listed in Section 4.1.3, the incremental effect of the Proposed Action remains inconsequential for the following reasons:

- Potential acoustic effects to fish would be negligible because of the lack of overlap between the acoustic sources that would be used and the hearing capabilities of fish (Appendix B).
- Other types of physical/mechanical disturbance to shoreline, benthic and water column habitats that are important to fish would also be negligible, being limited to extremely small areas for very brief periods, with no persistent effects on food, water quality, or other environmental features.

Some of the projects considered in the cumulative impacts analysis (e.g., shoreline construction) would likely have temporary direct and indirect impacts on marine fish primarily due to the temporary displacement of fish species and their prey (e.g., marine fish, invertebrates) from suitable habitat within the vicinity of the project areas. Due to the wide geographic separation of most of these projects, Navy activities would have small or negligible potential impact, and their potential impacts are not additive or synergistic. Long-term impacts to fish populations are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to fish would occur.

Marine Mammals

The Proposed Action at the Keyport Range Site would have limited effects on marine mammals. Acoustic exposures that would be considered harassment by NMFS are limited to a relatively small number of harbor seals (Section 3.5.6). Given the abundance of this species and its overlap with maritime-industrial activities in Puget Sound, individual harbor seals and local groups thereof probably experience disturbance from multiple anthropogenic sources, indicating the potential for cumulative effects. However, the abundance and coexistence of this species with anthropogenic activities suggests

that cumulative effects have not been, and would not in the future be considerable. Continued regulation of marine mammal exposures to anthropogenic disturbance by NMFS under the MMPA, coupled with stock assessments, documentation of mortality causes, and research into acoustic effects, ensure that cumulative effects would be minimized. The regulatory process ensures that each project proposing take of marine mammals is assessed in light of the status of the species and other actions affecting it in the same region. No other effects to marine mammals that might affect behavior, survival, distribution, or overall abundance are anticipated at the Keyport Range Site. This indicates that the overall potential for the Proposed Action to contribute incrementally to significant impacts is very low. No cumulative impacts are expected.

Risks to marine mammals emanate primarily from ship strikes, exposure to chemical toxins or biotoxins, exposure to fishing equipment that may result in entanglements, and disruption or depletion of food sources from fishing pressure and other environmental factors. Potential cumulative impacts of Navy activities on marine mammals would result primarily from possible ship strikes and sonar use. Stressors on marine mammals and marine mammal populations can include both natural stressors (i.e., disease, natural toxins, weather and climatic influence, navigation errors, social cohesion) and human-influenced stressors (i.e., fisheries interactions/bycatch, ship strikes, pollution and ingestion, noise, and whale watching). Implementing the Proposed Action at the Keyport Range Site would not, however, add to these risks and stressors. The activities that would be conducted would have minimal effects on marine mammals with respect to increased risk and stress. In addition, the projects considered for cumulative analysis described in Section 4.1.3 would not appreciably increase risks to and stresses upon marine mammals.

Implementation of the Proposed Action, including the ROP, would have minimal potential for cumulative effects on marine mammals, including ESA-listed species, when considered in conjunction with the cumulative projects listed in Section 4.1.3. Some of these projects (e.g., shoreline construction) would likely have temporary direct and indirect impacts on marine mammals primarily due to the temporary displacement of marine mammal species and their prey (e.g., marine fish, invertebrates) from suitable habitat within the vicinity of the project areas. However, the Proposed Action is not likely to affect the species through effects on annual rates of recruitment or survival. Long-term, permanent impacts to populations of marine mammals are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine mammals would occur.

Sediments and Water Quality

As described in Section 3.6.1, implementation of the Proposed Action would have only very minor, temporary and localized effects on sediments and water quality. The incremental effects of the Proposed Action would not add appreciably to any existing or future sediment or water quality impacts associated with other anthropogenic activities. Cumulatively, some of these activities would likely have direct and indirect but very minor effects on sediments associated with water quality. For example, although the projects considered for cumulative analysis near the Keyport Range Site are not expected to have any substantial sediment or water quality impacts, these projects may cause short-term temporary increases in turbidity in the nearshore environments. These disturbances, however, would not permanently nor adversely disrupt nearshore sediments because the sediments would quickly settle back down to the bottom. Cumulatively, sediment and water quality would not be adversely affected by these other projects. Therefore, no cumulative impacts to sediments and water quality would occur by adding the

incremental impact of the Proposed Action to the effects of the other projects considered for cumulative analysis.

Cultural Resources

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on cultural resources. Though various shell midden sites lie on the beaches surrounding the proposed project locations, the projects are not expected to disturb identified cultural resource sites. Shipwrecks identified within the proposed project locations are also unlikely to be affected by the projects since the shipwrecks are not found in the areas where the projects would take place. Additionally, Government-to-Government communication with Native American Indian Tribes has been established as part of this EIS/OEIS for the Keyport Range Site. This communication process would continue during implementation of the Navy's Proposed Action and help minimize any potential cumulative cultural resources impacts.

Most other ongoing and anticipated ocean activities such as commercial ship traffic, fishing, oil and gas development, or scientific research, would not substantially affect underwater cultural resources. The projects listed in Section 4.1.3 would have little or no potential to impact underwater cultural resources, primarily because most activities would take place on or above the surface and cultural resources, if any, would be located on the ocean bottom. Project activities would not generally disturb areas where cultural resources are known or expected to be present.

Mitigation strategies developed under the Draft Programmatic Agreement with the State Historic Preservation Office, such as avoidance or data recovery, should reduce impacts to a level less than significant. Any activities with the potential for significant impacts on cultural resources will require Section 106 consultation, and would be mitigated as required.

Any projects that could disturb cultural resources in the area would be required to evaluate their potential effects and, if necessary, implement mitigation measures similar to those described for the Proposed Action. Where avoidance was practiced, no cumulative effect would result because no contact with the resource would occur. Where data recovery was practiced, the cumulative effect would be that more cultural sites underwent data recovery and removal than would occur under the Proposed Action alone. Therefore, no cumulative impacts to cultural resources would occur when the incremental effects of the Proposed Action are added to effects of the projects considered for cumulative analysis.

Recreation

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have no substantial effects on recreation. Some projects would be likely to have minor direct and indirect effects, both individually and collectively. The projects near the Keyport Range Site could have recreation impacts; there would be some minor, temporary impacts associated with construction-related activities and increased boat traffic, thus potentially conflicting with Navy sound measurements and testing requirements and the need for clear/safe access for torpedo testing and retrieval. While construction phase activities may temporarily disrupt roadway and marine vessel traffic, this would not substantially impact recreation use, cumulatively, in the area. Since minimal impacts would result, but no cumulative impacts to recreation are anticipated when adding the effects of the Proposed Action to impacts generated by the projects considered for cumulative analysis.

Land and Shoreline Use

Some of the projects listed in Section 4.1.3 could potentially have minor short term direct and indirect land and shoreline cumulative effects in the region. For example, shoreline construction activities occurring in Liberty Bay and the Port Orchard Reach could potentially cause temporary shoreline impacts. The temporary impacts are directly and indirectly associated with the proposed construction activities while the more permanent impacts are associated with proposed pier/dock and shoreline stabilization. However, these are state approved projects and are consistent with the Washington SMA. Erosion is a naturally recurring issue, but it is not heavily exacerbated by military activities. While construction type projects in the region may have localized erosion, overall cumulative effects would be negligible since Best Management Practices for soil-disturbing activities are typically implemented during any construction activity. Therefore, the cumulative impacts of the Proposed Action in association with the past, present, and future projects would be insignificant given that the Proposed Action requires no land and shoreline construction.

Public Health and Safety and Environmental Hazards to Children

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal cumulative effects on public health and safety and would not pose cumulative environmental hazards to children. Safety procedures would be implemented when conducting proposed activities and construction activities to ensure the safety of personnel and the general public. Public safety measures already in use within Keyport Range Site would continue. Implementation of other projects near the range sites would not adversely affect NUWC Keyport's abilities to conduct activities safely. Therefore, no cumulative impacts to public safety and children would occur when adding the incremental impact of the Proposed Action to effects generated by the projects considered for cumulative analysis.

Socioeconomics and Environmental Justice

Cumulatively, there would be minimal effects on socioeconomics or environmental justice. Although the projects near the Keyport Range Site are not expected to have any substantial socioeconomic or environmental impacts, there would be some minor, temporary economic benefits associated with construction-related activities.

Effects on commercial and recreational fishermen, divers, and boaters would be short-term in nature and produce some temporary access limitations. Some offshore range activities, especially if coincident with peak fishing locations and periods, could cause temporary displacement and potential economic loss to individual fishermen. However, most offshore RDT&E and other NUWC Keyport managed activities are of short duration and have a small operational footprint. Effects on fishermen are mitigated by a series of Navy initiatives, including public notification of scheduled activities, near-real time schedule updates, prompt notification of schedule changes, and adjustment of hazardous operations areas. In selected instances where safety requirements dictate exclusive use of a specific area, fishermen may be asked to relocate to a safer nearby area for the duration of the exercise. These measures should not significantly impact any individual fisherman, overall commercial revenue, or public recreational opportunities.

However, regardless of the projects' long-term impacts, any incremental contribution to such effects from implementation of the Proposed Action would be negligible or non-existent. Based on the analysis in Section 3.11, which concludes that the proposed range extensions would have no direct effect on population, employment, or income in the region, there would be negligible, if any, indirect effects on fishing or other industries. Accordingly, no cumulative impacts to socioeconomics would occur.

Air Quality

Cumulative activities affecting air quality in the region include, but are not limited to, mobile sources such as automobiles and aircraft, and stationary sources such as power generating stations, manufacturing operations and other industry, etc. Area emissions include emissions from aircrafts, ships, and commercial boats, which are included in the mobile source category. These emissions would account for a small percentage of the overall air emissions budgets for each the local air basins. They do not include marine vessel emissions for vessels operating outside of U.S. territorial waters. These emissions are generally not included in the SIP emissions budget and in air quality planning because they are assumed to have a negligible effect on the ambient air quality, and because reductions in emissions from these sources would not generate a great improvement in the ambient air quality. All areas are in attainment for criteria pollutants and projects (when considered cumulatively) would not emit pollutants to such an extent to change this attainment status. Therefore, implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on air quality and no cumulative impacts to air quality would occur.

4.1.4.2 DBRC Site

Terrestrial Wildlife

Implementation of the Proposed Action and associated mitigation measures (e.g., avoidance of nesting bald eagles) would have minimal cumulative effects on terrestrial wildlife, including ESA-listed species, when considered incrementally with the cumulative projects listed in Section 4.1.3. Some of the projects (e.g., Fred Hill Materials Gravel Project) would likely have temporary direct and indirect cumulative impacts on terrestrial wildlife primarily due to the temporary displacement of wildlife species and their prey from suitable habitat within the vicinity of the project areas. However, long-term, permanent impacts to populations of terrestrial wildlife are not expected, either as a result of each project or when combined with other past, present, and reasonably foreseeable actions. Continued adherence to the requirements of the MBTA, EO 13186, and the Bald and Golden Eagle Protection Act (16 USC 668a-d dated June 8 1940 as twice amended) by NUWC Keyport would limit disturbance to migratory birds and ensure that important habitats do not become degraded. Existing regulatory mechanisms would protect bald eagles and the ESA-listed marbled murrelet (Section 3.1) and potential cumulative impacts to these species would not be significant when added to other projects considered in the cumulative analysis.

Marine Flora and Invertebrates

Implementation of the Proposed Action, when considered in combination with the projects listed in Section 4.1.3 and other anthropogenic activities, would have negligible cumulative effects on marine flora and invertebrates. Some of the projects (e.g., Hood Canal Bridge Repairs, Trident Support Facilities Explosives Handling Wharf), as well as other anthropogenic activities such as commercial and recreational harvesting of bivalves, would have temporary direct and indirect cumulative impacts on marine flora and invertebrates due to the suspension of sediments and short-term increases in turbidity within the water column in the nearshore environments where the activities occur. Continuing management of populations of commercially and recreationally important invertebrates, such as the geoduck, by the WDFW would limit the potential for cumulative effects of harvesting. The Proposed Action would have a negligible contribution to benthic habitat disturbance (e.g., from expended materials) or water quality effects such as turbidity, such that no adverse long-term, permanent impacts to populations of marine flora and invertebrates are expected, either as a result of each project or

cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine flora and invertebrates would occur.

Sea Turtles

Sea turtles do not occur at the DBRC Site. Therefore, no cumulative impacts to sea turtles would occur.

Fish

Implementation of the Proposed Action at the DBRC Site would have minimal effects on marine fish and their habitat, including EFH and ESA-listed species. When considered in conjunction with the cumulative projects listed in Section 4.1.3, the incremental effect of the Proposed Action remains inconsequential for the following reasons:

- Potential acoustic effects to fish would be negligible because of the lack of overlap between the acoustic sources that would be used and the hearing capabilities of fish (Appendix B).
- Other types of physical/mechanical disturbance to shoreline, benthic and water column habitats that are important to fish would also be negligible, being limited to extremely small areas for very brief periods, with no persistent effects on food, water quality, or other environmental features.

Some of the projects considered for cumulative analysis (e.g., Fred Hill Materials Gravel Project, Hood Canal Bridge Repair, Trident Support Facilities Explosives Handling Wharf) would likely have temporary direct and indirect impacts on marine fish primarily due to the temporary displacement of fish species and their prey (e.g., marine fish, invertebrates) from suitable habitat within the vicinity of the project areas. Due to the wide geographic separation of most of the projects considered for cumulative analysis, Navy activities associated with the Proposed Action would have small or negligible potential impact, and their potential impacts are not additive or synergistic. Long-term impacts to fish populations are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to fish would occur.

Marine Mammals

The Proposed Action at the DBRC Site would have limited effects on marine mammals. Acoustic exposures that would be considered harassment by NMFS are limited to California sea lions and harbor seals (Section 3.5.7). Given the abundance of these species and their overlap with maritime-industrial activities in Puget Sound, individuals and local groups probably experience disturbance from multiple anthropogenic sources, indicating the potential for cumulative effects. However, the abundance and coexistence of these species with anthropogenic activities suggests that cumulative effects have not been, and would not in the future be considerable. Continued regulation of marine mammal exposures to anthropogenic disturbance by NMFS under the MMPA, coupled with stock assessments, documentation of mortality causes, and research into acoustic effects, ensure that cumulative effects would be minimized. The regulatory process ensures that each project proposing take of marine mammals is assessed in light of the status of the species and other actions affecting it in the same region. No other effects to marine mammals that might affect behavior, survival, distribution, or overall abundance are anticipated at the DBRC Site. This indicates that the overall potential for the Proposed Action to contribute incrementally to significant impacts is very low. No cumulative impacts are expected.

Risks to marine mammals emanate primarily from ship strikes, exposure to chemical toxins or biotoxins, exposure to fishing equipment that may result in entanglements, and disruption or depletion of food sources from fishing pressure and other environmental factors. Potential cumulative impacts of Navy

activities on marine mammals would result primarily from possible ship strikes and sonar use. Stressors on marine mammals and marine mammal populations can include both natural stressors (i.e., disease, natural toxins, weather and climatic influence, navigation errors, social cohesion) and human-influenced stressors (i.e., fisheries interactions/bycatch, ship strikes, pollution and ingestion, noise, and whale watching). Implementing the Proposed Action at the DBRC Site would not, however, add to these risks and stressors. The activities that would be conducted would have minimal effects on marine mammals with respect to increased risk and stress. In addition, the projects considered for cumulative analysis described in Section 4.1.3 would not appreciably increase risks to and stresses upon marine mammals.

Implementation of the Proposed Action, including the ROP, would have minimal potential for cumulative effects on marine mammals, including ESA-listed species, when considered in conjunction with the projects listed in Section 4.1.3. Some of the projects considered for cumulative analysis (e.g., Hood Canal Bridge repairs, pier pilings installation) would likely have temporary direct and indirect impacts on marine mammals primarily due to the temporary displacement of marine mammal species and their prey (e.g., marine fish, invertebrates) from suitable habitat within the vicinity of the project areas. However, the Proposed Action is not likely to affect the species through effects on annual rates of recruitment or survival. Long-term, permanent impacts to populations of marine mammals are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine mammals would occur.

Sediments and Water Quality

As described in Section 3.6.2, implementation of the Proposed Action would have only very minor, temporary and localized effects on sediments and water quality. The incremental effects of the Proposed Action would not add appreciably to any existing or future sediment or water quality impacts associated with other anthropogenic activities. Cumulatively, some of these activities would likely have direct and indirect but very minor effects on sediments associated with water quality. For example, although the projects near the DBRC Site are not expected to have any substantial sediment or water quality impacts, these projects (e.g., the proposed Trident Support Facilities Explosives Handling Wharf) may cause short-term temporary increases in turbidity in the nearshore environments. These disturbances, however, would not permanently nor adversely disrupt nearshore sediments because the sediments would quickly settle back down to the bottom. Cumulatively, sediment and water quality would not be adversely affected by these other projects. Therefore, no cumulative impacts to sediments and water quality would occur by adding the impact of the Proposed Action to effects generated by the projects considered for cumulative analysis.

Cultural Resources

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on cultural resources. Though various shell midden sites lie on the beaches surrounding the proposed project locations, the projects are not expected to disturb identified cultural resource sites. Shipwrecks identified within the proposed project locations are also unlikely to be affected by the projects since the shipwrecks are not found in the areas where the projects would take place. Additionally, the Government-to-Government communication process with Native American Indian Tribes is currently in place and ongoing for the DBRC Site. This communication process would continue during implementation of the Proposed Action and would help minimize any impacts that may occur when cumulatively considering the projects.

Most other ongoing and anticipated ocean activities such as commercial ship traffic, fishing, oil and gas development, or scientific research, would not substantially affect underwater cultural resources. The projects considered for cumulative analysis would have little or no potential to impact underwater cultural resources, primarily because most activities would take place on or above the surface and cultural resources, if any, would be located on the ocean bottom. Project activities would not generally disturb areas where cultural resources are known or expected to be present.

Mitigation strategies developed under any Programmatic Agreement with the State Historic Preservation Office, such as avoidance or data recovery, should reduce impacts to a level less than significant. Any activities with the potential for significant impacts on cultural resources will require Section 106 consultation, and would be mitigated as required.

Any projects considered for cumulative analysis with the potential to disturb cultural resources in the area would be required to evaluate potential effects and, if necessary, implement mitigation measures similar to those described for the Proposed Action. Where avoidance was practiced, no cumulative effect would result because no contact with the resource would occur. Where data recovery was practiced, the cumulative effect would be that more cultural sites underwent data recovery and removal than would occur under the Proposed Action alone. Therefore, no cumulative impacts to cultural resources would occur when the incremental impact of the Proposed Action is added to effects resulting from the projects considered for cumulative analysis.

Recreation

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal impacts on recreation. Some projects would be likely to have minor direct and indirect effects, both individually and collectively. For example, the Jefferson County Master Planned Resort project has the potential to generate substantial additional pleasure boat traffic in and around Dabob Bay. The projects near the DBRC Site could have recreation impacts; there would be some minor, temporary impacts associated with construction-related activities and increased boat traffic, thus potentially conflicting with Navy sound measurements and testing requirements and the need for clear/safe access for torpedo testing and retrieval. Other potential short-term impacts could occur during construction of the Fred Hill Materials Gravel project and Hood Canal Bridge widening and constrain Navy testing capabilities. While construction phase activities may temporarily disrupt roadway and marine vessel traffic, this would not substantially impact recreation use, cumulatively, in the area. No significant cumulative impacts to recreation are anticipated when the effects of the Proposed Action are added to impacts of other projects considered for the cumulative analysis.

Land and Shoreline Use

Some of the projects listed in Section 4.1.3 could potentially have minor, short-term direct and indirect land and shoreline cumulative effects in the region. For example, shoreline construction activities occurring in Hood Canal could cause temporary and potentially permanent shoreline impacts. The temporary impacts are directly and indirectly associated with the proposed construction activities while the more permanent impacts are associated with proposed pier construction and their associated support facilities. However, these construction activities are state approved projects and are consistent with the Washington SMA. The proposed Fred Hill Materials Gravel project, the Hood Canal Bridge proposed widening, and the Trident Support Facilities Explosives Handling Wharf project would have land and shoreline impacts associated with construction activities, including noise and traffic disruptions (sporadic closure of local roadways). Erosion is a naturally recurring issue, but it is not heavily exacerbated by military activities. While construction type projects in the region may have localized erosion, overall

cumulative effects would be negligible since Best Management Practices for soil-disturbing activities are typically implemented during any construction activity. Therefore, the cumulative impacts of the Proposed Action in association with the past, present and future projects would be insignificant since the incremental impact is minimal.

Public Health and Safety and Environmental Hazards to Children

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal cumulative effects on public health and safety and would not pose cumulative environmental hazards to children. Safety procedures would be implemented when conducting proposed activities and construction activities to ensure the safety of personnel and the general public. Public safety measures already in use within DBRC Site would continue. Implementation of other projects near the range sites would not adversely affect NUWC Keyport's abilities to conduct activities safely. Therefore, no cumulative impacts to public safety and children would occur when adding the incremental impact of the Proposed Action to other projects considered for cumulative analysis.

Socioeconomics and Environmental Justice

Cumulatively, there would be minimal effects on socioeconomics or environmental justice. The Fred Hill Materials Gravel Project and Hood Canal Bridge widening project has the potential for substantial temporary benefits to the local economy associated with construction due to the magnitude of the projects but would not represent any major, long-term increase in employment. Although the construction phase of projects could involve some disruption of roadway and marine vessel traffic near the Hood Canal Bridge, this would not substantially disrupt economic activities in the area when considered cumulatively with the Proposed Action. Long-term socioeconomic and environmental justice impacts associated with post-construction operation of the gravel project activities are difficult to assess. However, regardless of the project's long-term impacts, any incremental contribution to such effects from implementation of the Proposed Action would be negligible or non-existent.

Effects on commercial and recreational fishermen, divers, and boaters would be short-term in nature and produce some temporary access limitations. Some offshore test and training activities, especially if coincident with peak fishing locations and periods, could cause temporary displacement and potential economic loss to individual fishermen. However, most offshore RDT&E and other NUWC Keyport managed activities are of short duration and have a small operational footprint. Effects on fishermen are mitigated by a series of Navy initiatives, including public notification of scheduled activities, near-real time schedule updates, prompt notification of schedule changes, and adjustment of hazardous operations areas. In selected instances where safety requirements dictate exclusive use of a specific area, fishermen may be asked to relocate to a safer nearby area for the duration of the exercise. These measures should not significantly impact any individual fisherman, overall commercial revenue, or public recreational opportunities.

Based on the analysis in Section 3.11, which concludes that the proposed range extensions would have no direct effect on population, employment, or income in the region, there would be negligible if any indirect effects on fishing or other industries. No cumulative impacts to socioeconomics would occur since the incremental impact of the Proposed Action is not significant when added to effects of the other projects considered for cumulative analysis.

Air Quality

Cumulative activities affecting air quality in the region include, but are not limited to, mobile sources such as automobiles and aircraft, and stationary sources such as power generating stations, manufacturing

operations and other industry, etc. Area emissions include emissions from aircrafts, ships, and commercial boats, which are included in the mobile source category. These emissions would account for a small percentage of the overall air emissions budgets for each the local air basins. They do not include marine vessel emissions for vessels operating outside of U.S. territorial waters. These emissions are generally not included in the SIP emissions budget and in air quality planning because they are assumed to have a negligible effect on the ambient air quality, and because reductions in emissions from these sources would not generate a great improvement in the ambient air quality. All areas are in attainment for criteria pollutants and projects (when considered cumulatively) would not emit pollutants to such an extent to change this attainment status. Therefore, implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on air quality and no cumulative impacts to air quality would occur.

4.1.4.3 QUTR Site

Terrestrial Wildlife

Implementation of the Proposed Action and the associated ROP would have minimal cumulative effects on terrestrial wildlife, including ESA-listed species, when considered incrementally with the cumulative projects listed in Section 4.1.3. Long-term, permanent impacts to populations of terrestrial wildlife are not expected, either as a result of each project or when combined with other past, present, and reasonably foreseeable actions. Continued adherence to the requirements of the MBTA, EO 13186, and the Bald and Golden Eagle Protection Act (16 USC 668a-d dated June 8 1940 as twice amended) by NUWC Keyport would limit disturbance to migratory birds and ensure that important habitats do not become degraded. Existing regulatory mechanisms would protect bald eagles and the ESA-listed marbled murrelet (Section 3.1) and potential cumulative impacts to these species would not be significant when added to other projects considered in the cumulative analysis.

Marine Flora and Invertebrates

Implementation of the Proposed Action, when considered in combination with the projects listed in Section 4.1.3 and other anthropogenic activities, would have negligible cumulative effects on marine flora and invertebrates. The Proposed Action would have a negligible contribution to benthic habitat disturbance (e.g., from expended materials) or water quality effects such as turbidity, such that no adverse long-term, permanent impacts to populations of marine flora and invertebrates are expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine flora and invertebrates would occur.

Sea Turtles

Incidental take in fishing operations, or bycatch, is one of the most serious threats to sea turtle populations. Sea turtles commonly ingest or become entangled in marine debris (e.g., tar balls, plastic bags, plastic pellets, balloons, and ghost fishing gear) as they feed along oceanographic fronts, where debris and their natural food items converge. Marine pollution from coastal runoff, marina and dock construction, dredging, aquaculture, increased underwater noise, and boat traffic can degrade marine habitats used by sea turtles. Sea turtles swimming or feeding at or just beneath the surface of the water are vulnerable to boat and vessel strikes, which can result in serious propeller injuries and death.

Sea turtles potentially occur, but only rarely, within the proposed QUTR Site range extension area, and the implementation of protective avoidance measures for sea turtles minimizes the potential for any

individual or cumulative effect associated with ship strikes of sea turtles. Proposed activities at the QUTR Site do not generate any other potential sources of cumulative impact to sea turtles such as entanglement or habitat degradation. None of the identified projects would singly or cumulatively impact sea turtle survival or reproduction within the proposed QUTR Site extension area. Therefore, no cumulative impacts to sea turtles would occur.

Marine Fish

Implementation of the Proposed Action at the QUTR Site would have minimal effects on marine fish and their habitat, including EFH and ESA-listed species. When considered in conjunction with the cumulative projects listed in Section 4.1.3, the incremental effect of the Proposed Action remains inconsequential for the following reasons:

- Potential acoustic effects to fish would be negligible because of the lack of overlap between the acoustic sources that would be used and the hearing capabilities of fish (Appendix B).
- Other types of physical/mechanical disturbance to shoreline, benthic and water column habitats that are important to fish would also be negligible, being limited to extremely small areas for very brief periods, with no persistent effects on food, water quality, or other environmental features.

Implementation of the Proposed Action would have minimal cumulative effects on marine fish and their habitat, including ESA-listed species, when considered in conjunction with the cumulative projects listed in Section 4.1.3. Some of these projects could have temporary direct and indirect impacts on marine fish primarily due to the temporary displacement of fish species and their prey (e.g., marine fish, invertebrates) from suitable habitat within the vicinity of the project areas. Navy activities would have small or negligible potential impact, and their potential impacts are not additive or synergistic. Long-term impacts to fish populations are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to fish would occur.

Marine Mammals

The Proposed Action at the QUTR Site would have limited effects on marine mammals. Acoustic exposures that would be considered harassment by NMFS are limited to four species of pinnipeds and the harbor porpoise, and consist almost exclusively of sub-TTS behavioral exposures (Section 3.5.8). Other anthropogenic sources, including Navy activities, are likely to generate additional exposures that would be considered harassment by NMFS, as well as contributing to increasing background noise in the ocean. Therefore, the potential for cumulative acoustic impacts would appear to exist, but the nature of any such cumulative effects is largely conjectural. Would animals avoid large areas where sub-TTS behavioral exposures and background noise increase? This is not clear, especially given the abundance and diversity of marine mammals in what would seem to be heavily impacted waters, such as off of southern California. Continued regulation of marine mammal exposures to anthropogenic disturbance by NMFS under the MMPA, coupled with stock assessments, documentation of mortality causes, and research into acoustic effects, assure that cumulative effects would be minimized. The regulatory process ensures that each project proposing take of marine mammals is assessed in light of the status of the species and other actions affecting it in the same region. No other effects to marine mammals that might affect behavior, survival, distribution, or overall abundance are anticipated at the QUTR Site. This indicates that the overall potential for the Proposed Action to contribute incrementally to significant cumulative impacts is very low.

Risks to marine mammals emanate primarily from ship strikes, exposure to chemical toxins or biotoxins, exposure to fishing equipment that may result in entanglements, and disruption or depletion of food sources from fishing pressure and other environmental factors. Stressors on marine mammals and marine mammal populations can include both natural stressors (i.e., disease, natural toxins, weather and climatic influence, navigation errors, social cohesion) and human-influenced stressors (i.e., fisheries interactions/bycatch, ship strikes, pollution and ingestion, noise, and whale watching). The activities that would be conducted would have minimal effects on marine mammals with respect to increased risk and stress. In addition, the projects considered for cumulative analysis described in Section 4.1.3 would not appreciably increase risks to and stresses upon marine mammals.

Implementation of the Proposed Action, including the ROP, would have minimal cumulative effects on marine mammals, including ESA-listed species, when considered in conjunction with the cumulative projects listed in Section 4.1.3. Some of these projects, such as alternatives analyzed for the Northwest Training Range Complex EIS, would have temporary direct and indirect impacts on marine mammals. However, the Proposed Action is not likely to affect the species through effects on annual rates of recruitment or survival. Long-term, permanent impacts to populations of marine mammals are not expected, either as a result of each project or cumulatively when combined with other past, present, and reasonably foreseeable actions including the Proposed Action. Therefore, no cumulative impacts to marine mammals would occur.

Sediments and Water Quality

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on sediments and water quality.

Cumulative impacts on ocean water quality (i.e., pollutants and discharges) would consist of the effects of the Proposed Action in concert with other marine projects, actions, and processes that contributed to water pollutants. Such activities would include recreational and commercial fishing, offshore oil and gas development, and other ocean industries. The effects of these activities on the QUTR site are known only in a very general sense. Commercial ocean industries, such as fishing and ocean transport, are dispersed over broad areas of the ocean, while most of the Navy activities occur in remote areas of the open ocean. Therefore, cumulative effects on marine water quality in the QUTR site are expected to be less than significant when adding the incremental impact of the Proposed Action to other projects considered for cumulative analysis.

Cultural Resources

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on cultural resources. Though various shell midden sites lie on the beaches surrounding the proposed project locations, the projects are not expected to disturb identified cultural resource sites. Shipwrecks identified within the proposed project locations are also unlikely to be affected by the projects since the shipwrecks are not found in the areas where the projects would take place. Additionally, the Government-to-Government communication process with Native American Indian Tribes has been established as part of this EIS/OEIS for the QUTR Site. This communication process would continue during implementation of the Proposed Action and would help minimize any impacts that may occur when cumulatively considering the projects.

Most other ongoing and anticipated ocean activities such as commercial ship traffic, fishing, oil and gas development, or scientific research, would not substantially affect underwater cultural resources. The projects considered for cumulative analysis would have little or no potential to impact underwater cultural

resources, primarily because most activities would take place on or above the surface and cultural resources, if any, would be located on the ocean bottom. Project activities would not generally disturb areas where cultural resources are known or expected to be present.

Mitigation strategies developed under the Draft Programmatic Agreement with the State Historic Preservation Office, such as avoidance or data recovery, should reduce impacts to a level less than significant. Any activities with the potential for significant impacts on cultural resources will require Section 106 consultation, and would be mitigated as required.

Any projects in the area with potential to disturb cultural resources would be required to evaluate potential effects and, if necessary, implement mitigation measures similar to those described for the Proposed Action. Where avoidance was practiced, no cumulative effect would result because no contact with the resource would occur. Where data recovery was practiced, the cumulative effect would be that more cultural sites underwent data recovery and removal than would occur under the Proposed Action alone. Therefore, no cumulative impacts to cultural resources would occur when the incremental impact of the Proposed Action is added to effects resulting from the projects considered for cumulative analysis.

Recreation

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have no substantial effects on recreation. Some projects would be likely to have minor direct and indirect effects, both individually and collectively. The projects near the QUTR Site are expected to have minimal recreation impacts. No significant cumulative impacts to recreation are anticipated when the effects of the Proposed Action are added to impacts of other projects considered for the cumulative analysis.

Land and Shoreline Use

The projects considered for cumulative analysis would not substantially disrupt land and shoreline use in the area; therefore, no cumulative impacts to land and shoreline use would occur when the impacts of the Proposed Action are added to the effects of these projects.

Public Health and Safety and Environmental Hazards to Children

Implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal cumulative effects on public health and safety and would not pose cumulative environmental hazards to children. Safety procedures would be implemented when conducting proposed activities and construction activities to ensure the safety of personnel and the general public. Public safety measures already in use within QUTR Site would continue. Implementation of other projects near the range sites would not adversely affect NUWC Keyport's abilities to conduct activities safely. Therefore, no cumulative impacts to public safety and children would occur when adding the incremental impact of the Proposed Action to other projects considered for cumulative analysis.

Socioeconomics and Environmental Justice

Cumulatively, there would be minimal effects on socioeconomics or environmental justice. Effects on commercial and recreational fishermen, divers, and boaters would be short-term in nature and produce some temporary access limitations. Some offshore Navy activities, especially if coincident with peak fishing locations and periods, could cause temporary displacement and potential economic loss to individual fishermen. However, most offshore RDT&E and other NUWC Keyport managed activities are of short duration and have a small operational footprint. Effects on fishermen are mitigated by a series of Navy initiatives, including public notification of scheduled activities, near-real time schedule updates,

prompt notification of schedule changes, and adjustment of hazardous operations areas. In selected instances where safety requires exclusive use of a specific area, fishermen may be asked to relocate to a safer nearby area for the duration of the exercise. These measures should not significantly impact any individual fisherman, overall commercial revenue, or public recreational opportunities.

Based on the analysis in Section 3.11, which concludes that the proposed range extensions would have no direct effect on population, employment, or income in the region, there would be negligible if any indirect effects on fishing or other industries. No cumulative impacts to socioeconomics would occur since the incremental impact of the Proposed Action is not significant when added to effects of the other projects considered for cumulative analysis.

Air Quality

Cumulative activities affecting air quality in the region include, but are not limited to, mobile sources such as automobiles and aircraft, and stationary sources such as power generating stations, manufacturing operations and other industry, etc. Area emissions include emissions from aircrafts, ships, and commercial boats, which are included in the mobile source category. These emissions would account for a small percentage of the overall air emissions budgets for each the local air basins. They do not include marine vessel emissions for vessels operating outside of U.S. territorial waters. These emissions are generally not included in the SIP emissions budget and in air quality planning because they are assumed to have a negligible effect on the ambient air quality, and because reductions in emissions from these sources would not generate a great improvement in the ambient air quality. All areas are in attainment for criteria pollutants and projects (when considered cumulatively) would not emit pollutants to such an extent to change this attainment status. Therefore, implementation of the Proposed Action, when considered cumulatively with the projects listed in Section 4.1.3, would have minimal effects on air quality and no cumulative impacts to air quality would occur.

4.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action would constitute an irreversible or irretrievable commitment of nonrenewable or depletable resources (e.g., fuel, test material components), for the materials and energy expended during activities in the NAVSEA NUWC Keyport Range Complex. NUWC Keyport applies range sustainability concepts to all aspects of its activities. Such range sustainability practices are a comprehensive set of practices that result in a reduced volume of wastes to be dealt with or transferred to the environment.

The proposed activities could be accommodated largely by use of existing equipment and infrastructure at Keyport Range Site, DBRC Site, and QUTR Site. Additional equipment brought to the range sites to conduct certain types of activities would be used only for the duration of the activities they are supporting. The Proposed Action does not include construction or renovation projects that would require supplies of nonrenewable or depletable resources.

Implementation of the Proposed Action would not result in the destruction of environmental resources such that the range of potential uses of the environment would be limited. The Proposed Action would not adversely affect the biodiversity or cultural integrity of the marine, terrestrial, or human environment in the NAVSEA NUWC Keyport Range Complex. Therefore, although the Proposed Action would require the use of nonrenewable and depletable resources, NUWC Keyport would minimize the irreversible or irretrievable commitment of resources associated with the Proposed Action.

4.3 COMPLIANCE WITH APPLICABLE LAWS AND REGULATIONS

Based on evaluation of the Proposed Action with respect to consistency with land use guidelines for the project areas, the Proposed Action does not conflict with the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 4-3 provides a summary of compliance of the Proposed Action with federal, state, and local plans, policies, and controls. Appendix H contains relevant communications associated with regulatory compliance.

Table 4-3 Status of Compliance with Relevant Plans, Policies, and Controls

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
NEPA (42 USC §4321 <i>et seq.</i>) Department of the Navy Procedures for Implementing NEPA (32 CFR 775)	U.S. Navy	This EIS/OEIS has been prepared in accordance with CEQ Regulations implementing NEPA and Navy NEPA procedures. Preparation of this EIS/OEIS and provision for its public review are being conducted in compliance with NEPA.
EO 12114, <i>Environmental Effects Abroad of Major Federal Actions</i> (44 Federal Register 1957)	U.S. Navy	This EIS/OEIS has been prepared in accordance with Navy procedures implementing EO 12114 addressing components of the Proposed Action beyond 12 nm from shore.
CZMA (16 USC §1451 <i>et seq.</i>) Washington Shoreline Management Act (RCW 90.58; WAC 173-27-060)	U.S. Navy/ Washington Department of Ecology/ Local Counties	The Navy believes that the Proposed Action would be consistent to the maximum extent practicable with the enforceable policies of the Washington Coastal Zone Management Program and will complete a Coastal Consistency Determination in accordance with the CZMA, after consideration of comments on the Draft EIS/OEIS. The Navy has submitted a description of the Preferred Alternative, along with a copy of the Coastal Consistency Determination, to the Washington Department of Ecology. The Washington Department of Ecology has concurred with this determination (Appendix H).
Federal Water Pollution Control Act or CWA (Sections 401 and 404, 33 USC §1251 <i>et seq.</i>) and	USEPA/USACE	Section 401 and Section 404 permits would not be required for the Proposed Action.
Rivers and Harbors Act (Section 10, 33 USC 401 <i>et seq.</i>)	USEPA/USACE	A Section 10 Nationwide permit would not be required for the Proposed Action.
CAA (42 USC §7401 <i>et seq.</i>)	USEPA	All affected counties are in attainment. The Proposed Action would not compromise air quality attainment status in Washington or conflict with attainment and maintenance goals established in its SIP. Therefore, a CAA conformity determination is not required.
EO 11990, <i>Protection of Wetlands</i> (42 Federal Register 26961)	U.S. Navy	The Proposed Action does not occur in wetlands and would have no impact to wetlands.

Table 4-3 Status of Compliance with Relevant Plans, Policies, and Controls (Continued)

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
ESA (16 USC §1531 <i>et seq.</i>)	USFWS, NMFS	The Navy consulted with the Services. Per section 7 requirements, a BE was prepared to address potential impacts to ESA-listed species. The Navy will comply with the reasonable and prudent measures and the required terms and conditions resulting from the consultations to the extent practicable.
Magnuson-Stevens Fishery Conservation and Management Act (16 USC §§1801-1802)	NMFS	The Navy has determined that the Proposed Action would not have adverse effects on EFH and that consultation with NMFS is not required.
MMPA (16 USC §1431 <i>et seq.</i> and 50 CFR Part 216)	NMFS	As a result of acoustic effects associated with the use of underwater active acoustic sources, the Proposed Action may result in incidental harassment of marine mammals. No adverse effects on the annual rates of recruitment or survival of any of the species and stocks assessed in this document are expected. To support MMPA compliance and consultation regarding potential impacts to marine mammals, the Navy has applied to NMFS for an LOA for their proposed activities within the NAVSEA NUWC Keyport Range Complex analyzed under this EIS/OEIS.
EO 13186, <i>Responsibilities of Federal Agencies to Protect Migratory Birds</i> (66 Federal Register 3853)	U.S. Navy	The Proposed Action is not likely to have a measurable negative effect on migratory bird populations and would be in compliance with EO 13186.
MBTA (16 USC §§703-712)	USFWS	The Proposed Action is not likely to have a measurable negative effect on migratory bird populations and would be in compliance with the MBTA.
Bald and Golden Eagle Protection Act (16 USC §668a) (“Eagle Act”)	USFWS	The Proposed Action would not disturb, adversely affect, or result in any takes of bald eagles and would be in compliance with the Eagle Act.
EO 12898, <i>Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations</i> (59 Federal Register 7629)	U.S. Navy	No disproportionately high and adverse impacts to minority and low-income populations would be expected for the resources analyzed in this EIS/OEIS.
EO 13045, <i>Protection of Children from Environmental Health Risks and Safety Risks</i> (62 Federal Register 19885)	U.S. Navy	Children would not be disproportionately exposed to environmental health and safety risks by the Proposed Action.
National Historic Preservation Act (§ 106, 16 USC §470 <i>et seq.</i>)	Washington Department of Archaeology and Historic Preservation	The Proposed Action would have no effects on National Register or eligible properties (including shipwrecks) and would be in compliance with the Section 106 of the National Historic Preservation Act.

Table 4-3 Status of Compliance with Relevant Plans, Policies, and Controls (Continued)

<i>Plans, Policies, and Controls</i>	<i>Responsible Agency</i>	<i>Status of Compliance</i>
National Marine Sanctuaries Act (16 USC §1431 <i>et seq.</i>) and Olympic Coast National Marine Sanctuary Regulations (15 CFR §922.150 <i>et seq.</i>)	NOAA	NUWC Keyport has briefed OCNMS as a portion of the Proposed Action would take place within OCNMS Boundaries. Proposed Navy activities are consistent with continuing and historical use of the waters within and adjacent to the existing QUTR, and would not destroy, cause the loss of, or injure a Sanctuary resource. Therefore, consultation under § 304(d) of the NMSA is not required. The Proposed Action would be in compliance with the National Marine Sanctuaries Act, and no amendment to the OCNMS regulations would be required.
EO 13158, <i>Marine Protected Areas</i> (65 Federal Register 34909)	Department of Commerce: National Ocean Service and NMFS; Department of the Interior: NPS, USFWS, Minerals Management Service, and U.S. Geological Survey	Marine Protected Areas (MPAs) have not yet been officially designated under EO 13158.

4.4 GOVERNMENT-TO-GOVERNMENT CONSULTATION

Over the course of this EIS/OEIS, Navy representatives from NUWC Keyport have been in contact with Tribal representatives regarding the Proposed Action. See Section 1.4.3 for a discussion of Government-to-Government consultation conducted for this EIS/OEIS. As part of the environmental review process, this EIS/OEIS will be presented to Native American Indian Tribes and Nations to provide information, gather comments, and to continue the dialogue and ongoing communication regarding the Proposed Action.

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