Environmental Assessment

Pier and Support Facilities for Transit Protection System at U.S. Coast Guard Air Station/Sector Field Office Port Angeles, Washington

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Department of the Navy

Cooperating Agency:
United States Coast Guard

Action Proponent:
Naval Base Kitsap

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Abstract

This Environmental Assessment evaluates the potential environmental impacts associated with the United States Department of the Navy's Proposed Action to construct a pier and upland support facilities for the Transit Protection System at U.S. Coast Guard Air Station/Sector Field Office Port Angeles located in the City of Port Angeles, Washington. This Environmental Assessment analyzes the environmental effects on the natural and human environment from the potential implementation of three action alternatives and the No Action Alternative. The U.S. Coast Guard is a cooperating agency.

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EXECUTIVE SUMMARY

Proposed Action

The United States (U.S.) Department of the Navy (Navy) proposes to construct a pier and upland support facilities for the Transit Protection System (TPS) at U.S. Coast Guard (USCG) Air Station/Sector Field Office Port Angeles (AIRSTA/SFO Port Angeles) located in the City of Port Angeles, Washington. The Proposed Action is located within Port Angeles on the eastern end and southern side of Ediz Hook. The project proponent and lead agency for this Environmental Assessment (EA) is the Navy. The USCG is a cooperating agency.

Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide a staging location for TPS vessels and crews that escort Navy submarines to and from their dive/surface points in the Strait of Juan de Fuca and Naval Base Kitsap Bangor. The Proposed Action is needed to comply with USCG requirements for underway hour limits and required crew rest between escort missions. Underway hours are defined as the time required for USCG crews to prepare for, perform, and complete small boat operations.

Without a dedicated forward-staging location, USCG crews routinely exceed their underway hour limits, often for multiple days. In particular, rough weather, back-to-back missions, and scheduling changes result in longer-than-mandated operations to maintain national strategic requirements. These conditions do not allow the crews to operate at their full capabilities and are not sustainable in the long term. Locating a facility in Port Angeles would allow for staging of escort vessels in proximity to dive/surface points in the Strait of Juan de Fuca.

Existing Conditions

The project sites consist of uplands, beach, and nearshore marine waters located at Ediz Hook. The upland portions of the project sites are flat and have both developed and undeveloped areas. The developed areas consist of structures that serve USCG AIRSTA/SFO Port Angeles, such as the Chief Petty Officer (CPO) mess, helicopter hangars, administration building, medical/dental building, and communications station. The undeveloped areas are generally devoid of trees and include landscaped or open areas. The beach area is fairly narrow at high tide and consists of silt, sand, and small cobbles. Aquatic vegetation in the nearshore area consists of brown algae, sea lettuce, kelp, and eelgrass. USCG AIRSTA/SFO facilities in the nearshore marine waters of Port Angeles Harbor include a T-shaped pier for berthing USCG AIRSTA/SFO Port Angeles vessels and a wave attenuation structure. An existing jetty east of the USCG AIRSTA/SFO Port Angeles entrance gate extends approximately 215 feet offshore from the inner Ediz Hook shoreline. The jetty is located in aquatic tidelands shallower than -30 feet mean lower low water (MLLW). The jetty is lined with rock riprap and protected with a timber bulkhead capped by a concrete slab. Off the end of the jetty is an underwater rock pile, created from excess riprap used in armoring Ediz Hook, which is used by the scuba diving community. To the west of USCG AIRSTA/SFO Port Angeles is a public boat ramp, the Puget Sound Pilots Station, and Icicle Seafoods' onshore facilities. Icicle Seafoods raises Atlantic salmon in two fish pen arrays comprised of 20 individual fish pens located offshore from USCG AIRSTA/SFO Port Angeles. The western fish pen array is located approximately 525 feet off shore and approximately 510 feet southeast of the end of the existing jetty. The eastern fish pen array is located approximately 750 feet offshore and approximately 950 feet southwest of the existing T-Pier.

Alternatives Considered

The Navy has identified three action alternatives for constructing a pier and upland facilities. The three action alternatives would entail constructing a new berthing pier for up to seven TPS vessels with full hotel services (power, water, sewer, phone, and internet service); an Alert Forces Facility (AFF) with temporary living accommodations for 20 to 30 TPS crew members; a Ready Service Armory (RSA) for storing small arms and ammunition; a diesel fuel marine storage tank and fuel distribution system; and other upland improvements. All three action alternatives would be located on Ediz Hook. The primary difference between the alternatives is their proposed location and design of the pier.

- **Alternative 1 – Midwestern Site (Preferred Alternative).** Alternative 1 would be located about 0.4 mile east of the entrance gate, to the west of the existing medical and dental clinic. The pier would consist of a fixed approach trestle and fixed pier.
- **Alternative 2 – Western Site**. Alternative 2 would be located on the existing jetty about 0.1 mile east of the entrance gate. The pier would consist of a fixed approach trestle, a transfer span, and a floating pontoon.
- **Alternative 3 – Eastern Site.** Alternative 3 would be located at the eastern end of USCG AIRSTA/SFO Port Angeles, approximately 1 mile east of the entrance gate, near an abandoned runway. Under Alternative 3, the pier would be similar to the Alternative 2 pier, and would consist of a fixed approach trestle, a transfer span, and a floating pontoon. Unlike Alternatives 1 and 2, Alternative 3 would include a wave attenuation structure to protect the floating pontoon from wave action.

Under the No Action Alternative, the status quo would continue. The Navy would not construct a TPS pier and upland facilities at USCG AIRSTA/SFO Port Angeles. The TPS vessels would continue to be berthed on a space available basis at PoPA facilities. Crew members would continue without a dedicated facility for overnight accommodations and mission planning, and TPS crew and maintenance technicians would continue to drive or be transported in vehicles between the PoPA and USCG AIRSTA/SFO Port Angeles. Underway hour limits, policies, and regulations would continue to be unmet. For these reasons, the No Action Alternative would not meet the purpose and need for the Proposed Action.

Alternative 1 is the Preferred Alternative because it meets the purpose and need and avoids long term impacts to the Puget Sound Pilots Station and recreational and ecological resources at the rock pile that would occur with implementation of Alternative 2. Additionally, Alternative 1 is responsive to public concerns regarding siting. Alternative 1 avoids impacts to the expansive eelgrass beds associated with Alternative 3 which is also some of the last undeveloped land on Ediz Hook. All action alternatives would include compensatory mitigation for the loss of aquatic resources and mitigation for impacts on treaty reserved rights and resources. The proposed compensatory mitigation under Alternatives 1 and 3 would involve the removal of fill and a bulkhead located in aquatic tidelands off the south shoreline of inner Ediz Hook east of the USCG AIRSTA/SFO Port Angeles entrance gate, and contouring of the shoreline. Because the Alternative 2 design utilizes the proposed compensatory mitigation site, if this alternative is selected, other compensatory mitigation would need to be developed in consultation with the U.S. Army Corps of Engineers (USACE) to compensate for impacts on aquatic resources. The proposed treaty resources mitigation would involve the removal of rock armoring, imported fill and debris, concrete/asphalt pads, and storage structures at the Icicle Seafoods laydown area, grading to create a low slope beach, sand/gravel beach nourishment, and native vegetation, in addition to the removal of a nearby derelict building. Additionally, the Lower Elwha Klallam Tribe

and the Navy have agreed to examine the feasibility of salvaging eelgrass from the planned TPS pier footprint and transplanting on shallow subtidal restoration sites along Ediz Hook. If the parties agree that the project is feasible, the Navy will enter into a Cooperative Agreement under the Sikes Act with the Lower Elwha Klallam Tribe for the Tribe to perform the work and the Navy to provide funding. The proposed treaty mitigation would be the same for all alternatives.

Summary of Environmental Resources Evaluated in the EA

The following resource areas are addressed in this EA: land use and recreation, water quality and sediments, biological resources, noise, cultural resources, American Indian traditional resources, socioeconomics, marine traffic and transportation, shore traffic and circulation, visual resources, and solid waste and hazardous materials. Wetlands, air quality, public safety, and utilities and energy were not analyzed in this EA, because potential impacts on these resources were considered to be nonexistent or negligible.

The impacts of TPS vessel movement activities are addressed in the 2015 *Northwest Training and Testing Final Environmental Impact Statement/Overseas Environmental Impact Statement* (NWTT FEIS). The impact analysis documented in the NWTT FEIS identified the potential for minor impacts to American Indian traditional resources, transportation and shipping, commercial and recreational fishing, and tourism associated with the presence of security zones surrounding Navy vessels during transit. This EA evaluates the TPS vessels when they are moored at USCG AIRSTA/SFO Port Angeles, and includes activities such as fueling and maintenance. For the purposes of this EA, the term “operations” is defined as any long-term activities related to the moored TPS vessels, and use of the upland facilities following completion of construction of the project.

Summary of Potential Environmental Consequences of the Action Alternatives

A summary of the potential environmental impacts of Alternatives 1, 2, and 3 is provided by resource topic, below. The No Action Alternative would not involve the development of any new facilities for the TPS in Port Angeles. No potential environmental impacts would occur under this alternative compared to existing conditions.

Land Use and Recreation

Construction of Alternative 1 (the Preferred Alternative), Alternative 2, or Alternative 3 would not displace any adjacent land uses, and would have no direct impact on zoning or land use designations on or adjacent to USCG AIRSTA/SFO Port Angeles. Commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles would experience temporary increases in noise levels during construction, primarily during pile driving. Noise-generating construction activities would be restricted to daytime hours (7:00 a.m. to 10:00 p.m.) and are therefore exempt from Washington State and City of Port Angeles noise regulations, and the temporary increase in noise levels would not be incompatible with existing adjacent land uses. There would be no significant short-term impacts on land use from construction of any of the action alternatives.

Construction of Alternative 1 would not displace any existing recreational sites, facilities, or uses on Ediz Hook in upland areas or on the shoreline. However, small non-motorized watercraft such as kayaks, canoes, and crew shells that traverse close to the shore on the south side of Ediz Hook would temporarily be prohibited from entering the in-water construction area and would have to traverse around the construction site at a greater distance from the shore. Additionally, the presence of construction equipment and the generation of construction noise could temporarily reduce the quality of the recreational experience for visitors seeking quiet and

solitude or engaged in quiet activities such as bird and wildlife viewing by impairing views and increasing noise levels. Under Alternative 2, construction noise levels at commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles would be higher due to their proximity to the project site, but pile driving, which generates the highest noise levels, would last 1/5 of the time as under Alternative 1. Additionally under Alternative 2, access to the rock pile dive site would be lost both during and after construction because the TPS pier would be located over it. Because the rock pile is not a designated (protected) recreation site and there are opportunities for diving in the general area, the proposed facilities under Alternative 2 would not have a significant impact on recreation. Alternative 3 would have impacts on recreational uses similar to those under Alternative 1, except that construction noise levels would be lower at nearby recreational areas due to the greater distance to the closest public access area.

The new upland, shoreline, and in-water structures, and proposed operations and maintenance activities would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles lands under all action alternatives. Upland and shoreline structures, operations, and maintenance would not displace any existing adjacent land uses, and would be compatible with the City of Port Angeles zoning and land use designations on and adjacent to USCG AIRSTA/SFO Port Angeles. Potential long-term impacts on land use from the action alternatives are primarily associated with the location of the TPS pier. The TPS pier would extend into submerged aquatic lands (bedlands) owned by Washington State and managed by the State Department of Natural Resources (DNR) (in waters deeper than -24 feet MLLW). Under Alternative 1, the TPS pier would extend approximately 40 feet into DNR's aquatic lease lands currently leased by Icicle Seafoods for their floating fish pens. This could potentially affect ongoing and future use of DNR's aquatic lease area near the TPS pier by constraining the location or configuration of ongoing or future aquaculture operations within the lease area. Alternative 1 was designed to minimize the distance that the TPS pier would extend into the aquatic lease area to the extent feasible given the depth requirements needed for safe maneuvering of the TPS vessels as they navigate to and from port. Additionally, the proposed treaty mitigation, which involves the removal of fill at the Icicle Seafoods laydown area, would affect existing land uses in DNR aquatic tidelands under all action alternatives. Removal of this fill would be consistent with the with the City of Port Angeles' and DNR's goals of removing fill and decaying structures, and restoration of the shoreline on Ediz Hook.

The operation of the action alternatives would not alter or displace any existing recreational sites, facilities, or uses on Ediz Hook in upland areas or on the shoreline. Kayakers and other recreational boaters that navigate along the south shore of Ediz Hook would be restricted from entering the Naval Vessel Protection Zone (NVPZ) while Blocking Vessels (BVs) are moored, and from entering the security zone that the USCG would establish around the TPS pier after it is constructed. This would reduce the aquatic areas open to public use by recreational boaters along the south shore of Ediz Hook adjacent to USCG AIRSTA/SFO Port Angeles in the future. However, this would not result in the loss of any designated recreation area or park, and would not have a significant impact on recreation.

Water Quality and Sediments

Alternative 1, Alternative 2, and Alternative 3 would generate small, localized increases in turbidity from the installation of piles for the TPS pier and barge and tug operations, including propeller wash and anchoring, and (under Alternative 3) the installation of piles for the wave attenuation structure (breakwater). Alternative 1 would require the installation of 80 temporary and 144 permanent in-water piles and 75 pile driving days; Alternative 2 would require the installation of 30 temporary and 14 permanent in-water piles and 15 pile driving days; and

Alternative 3 would require the installation of 30 temporary and 57 permanent in-water piles (17 for the pier and 40 for the breakwater) and 25 pile driving days. The greatest turbidity impacts would occur under Alternative 1. However, turbidity would not exceed water quality parameters under any of the alternatives and would not extend beyond construction. Under Alternative 1, Alternative 2, and Alternative 3, the piles would create small localized eddies during tidal movements, but these effects would not affect longshore currents or sediment transport, and would not affect overall water quality or sediments. Under Alternatives 2 and 3, the floating pontoon would split surface currents at the site, but this effect would also not affect longshore currents or sediment transport, and would have a negligible effect on water quality and sediments. Under Alternatives 1 and 3, the proposed compensatory mitigation for the loss of aquatic resources and treaty mitigation (described above) to remove imported fill in aquatic tidelands, armoring along the inner Ediz Hook shoreline, and contouring to match the surrounding shoreline would offset these small, localized effects on circulation and would provide an overall benefit to water quality and sediments in the North Harbor area of Port Angeles Harbor over the long term under all of the action alternatives. Under Alternative 2, the proposed treaty mitigation would be implemented; however, the proposed compensatory mitigation would not be implemented, and other compensatory mitigation would need to be developed in coordination with the USACE.

Biological Resources

The greatest potential impact on biological resources would result from impact pile driving. Under all three action alternatives, airborne noise may cause birds to avoid the area temporarily and may affect Endangered Species Act (ESA)-listed marbled murrelets by potentially masking their vocalizations. Airborne noise could also cause behavioral disturbance to seals that are hauled out within the airborne behavioral disturbance threshold zone at the time of impact pile driving activities. Underwater noise during impact pile driving would be localized and temporary, but may affect ESA-listed Puget Sound Chinook Evolutionarily Significant Unit (ESU), Puget Sound steelhead Distinct Population Segment (DPS), Hood Canal summer-run chum ESU, and bull trout. Pile driving would primarily be vibratory and occur within the in-water work window of July 16 through February 15 when juvenile salmonids are least likely to be present. Small numbers of juvenile Chinook and chum may be present within the in-water work window as well as returning adults. These juveniles and adults may be temporarily exposed to injurious noise levels during impact pile driving. Pacific eulachon and North American green sturgeon are rare within the harbor in general and would likely not be affected. There would be short-term and temporary impacts on Puget Sound Chinook ESU and bull trout designated critical habitat, but no impacts on North American green sturgeon southern DPS designated critical habitat.

No behavioral disturbance to ESA-listed Southern Resident killer whales or humpback whales would occur under any of the action alternatives as these species do not typically occur in the harbor and a marine mammal monitoring plan would further minimize potential impacts. No significant impacts would result on Southern Resident killer whale critical habitat. An application for an Incidental Harassment Authorization (IHA) has been submitted to the National Marine Fisheries Service (NMFS) under the Marine Mammal Protection Act (MMPA) to request authorization for behavioral disturbance of pinnipeds and harbor porpoises and potential injurious exposure of up to 75 harbor seals that occur or may occur in the area during pile driving. During impact pile driving, marine mammal monitoring would occur, and pile driving would cease should a marine mammal approach the shutdown zone and in some cases the behavioral disturbance zone. With the implementation of general conditions outlined in NMFS' authorization and implementation of an approved Marine Mammal Monitoring and Mitigation

Plan, no significant impacts on marine mammals would occur under any of the action alternatives.

Pile driving would create turbidity, reduced dissolved oxygen, and resuspension of marine sediment that would temporarily impact marine fish (including ESA-listed species), benthic invertebrates, and Essential Fish Habitat (EFH) under all three action alternatives. However, impacts would be localized, temporary, and minimized by implementing best management practices (BMPs) and project minimization measures. The greatest loss of seafloor habitat from pile placement and direct loss of less-mobile benthic invertebrates would occur under Alternative 1, but it would not significantly impact benthic habitat availability or benthic species occurring within the Port Angeles Harbor. The area of permanent overwater coverage within the nearshore area shallower than -30 feet MLLW would be greatest under Alternative 3 and least under Alternative 2. However, overwater coverage under Alternative 2 would cause the greatest impacts on marine vegetation, invertebrates, juvenile fish, and EFH, as the underwater rock pile exists within the proposed footprint. All three action alternatives may adversely affect EFH; however, implementation of BMPs and project-specific measures would avoid and minimize adverse effects on EFH.

The creation of nearshore overwater shade from the TPS pier would also result in a potential loss of eelgrass under all three action alternatives. Alternative 3 would potentially impact the most eelgrass of all alternatives, and the least would be impacted under Alternative 2. A Mitigation Action Plan has been prepared to mitigate for the loss of aquatic resources and for impacts on treaty reserved rights and resources under the Proposed Action. As described above, the proposed compensatory mitigation and treaty mitigation would be implemented under Alternatives 1 and 3. Under Alternative 2, the proposed treaty mitigation would be implemented; however, the proposed compensatory mitigation could not be implemented, and other compensatory mitigation would need to be developed in coordination with the USACE.

Other than the increase of permanent shading from the proposed pier and the loss of eelgrass that would occur under each alternative, all other adverse effects would be short term, lasting only during the period of construction, and would cease upon completion of construction activities.

Noise

Alternative 1, Alternative, 2, and Alternative 3 would generate increased noise levels during construction, predominantly during pile driving. All areas within approximately 12,800 feet (2.4 miles) of the project site would experience temporary and periodic increases in noise levels above ambient noise levels (51–53 A-weighted decibels [dBA]) during pile driving that could result in annoyance and interference with outdoor speech and communication. Noise from pile driving would attenuate close to ambient noise levels at the closest residences (Class A receiving properties) to the project site, which are located approximately 8,000 feet across Port Angeles Harbor in downtown Port Angeles.

Under Alternative 1, noise levels at the Puget Sound Pilots Station would be approximately 68 dBA during vibratory pile driving and approximately 77 dBA during impact pile driving; interior noise levels would be approximately 43 dBA during vibratory pile driving and 52 dBA during impact pile driving. Potential noise impacts during pile driving at adjacent or nearby properties would range from mild to moderate annoyance, interfere with outdoor speech/communication, and cause intermittent short-term interference with daytime sleep at the Puget Sound Pilots Station during impact pile driving. Pile driving would last a maximum of 4 hours per day for up to 75 days over a period of 18 weeks. Pile driving would be limited to daylight hours, and impact pile driving would occur a fraction of the total pile driving time each day, so interference with

sleep during daylight hours would be intermittent and short in duration. Under Alternative 2, noise impacts from pile driving would be greater in magnitude/intensity because the Puget Sound Pilots Station is closer to the project site, approximately 350 feet to the west. Noise levels at the Pilots Station would be approximately 84 dBA during vibratory pile driving and approximately 93 dBA during impact pile driving. Interior noise levels at the Pilots Station would be approximately 59 dBA during vibratory pile driving and 63 dBA during impact pile driving, and could result in intermittent short-term interference with sleep during daylight hours and indoor speech and communication. Earplugs could be used to reduce noise during pile driving. Although the magnitude/intensity of noise impacts would be greater than under Alternative 1, Alternative 2 would require 15 days of pile driving over a period of five weeks, about 1/5 of the time required under Alternative 1. Under Alternative 3, noise impacts from pile driving would be smaller in magnitude and intensity than under Alternative 1 and Alternative 2 because the Puget Sound Pilots Station is located farther from (approximately 5,200 feet) the project site. Under Alternative 3, the Puget Sound Pilots Station would experience temporary noise levels up to 61 dBA during vibratory pile driving and periodic noise levels up to 70 dBA during impact pile driving in outdoor areas. Interior noise levels at the Puget Sound Pilots Station would be approximately 36 dBA during vibratory pile driving and 45 dBA during impact pile driving, considered to be relatively quiet. The duration of noise impacts would be shorter (1/3 of the time) than under Alternative 1 and slightly longer than Alternative 2 (10 days more). Construction noise between 7:00 a.m. and 10:00 p.m. is exempt from the maximum permissible noise levels specified in Washington Administrative Code (WAC) 173-60-040, so noise impacts from pile driving would not be considered a significant impact.

Under Alternative 1, Alternative 2, and Alternative 3, vessel operations at the proposed TPS pier are expected to generate the highest noise levels of all noise generated by operation of the project: approximately 53 dBA during vessel idling, and approximately 57 dBA during vessel departure. Resulting exterior noise levels at the Puget Sound Pilots Station would range from within ambient noise levels up to an increase of about 4 dBA above ambient noise levels (under Alternative 2), but would not exceed the maximum permissible noise levels from a Class C property to a Class B receiving property specified in state and local regulations under any of the alternatives, so there would be no significant long-term noise impacts at adjacent receiving properties.

Cultural Resources

The potential of finding archaeological resources within the Area of Potential Effects (APE) is extremely low because most excavations for Alternative 1, Alternative 2, and Alternative 3 would not exceed 4.5 feet in depth, and 5 feet of fill exists within the project area. For any excavations exceeding 4.5 feet in depth, an archaeological monitor who meets the Secretary of the Interior's Standards would be present to ensure that cultural resources are not affected. Alternative 1, Alternative 2, and Alternative 3 would have no effect on historic architectural properties because none are located within the APE. While the site is not recorded as a traditional cultural property (TCP), the Lower Elwha Klallam Tribe have stated that they consider Ediz Hook to be a TCP because it is a "culturally and historically the geographic feature" that has been utilized and occupied by the Lower Elwha Klallam Tribe from its earliest origins. Discussions with tribal representatives regarding the Proposed Action have affirmed their belief that Ediz Hook is part of a larger TCP that includes the Port Angeles Harbor referred to as *ĉixw íc̓ən.* In consultation with the Lower Elwha Klallam Tribe, the Navy has determined that none of the action alternatives would have an adverse effect on the TCP. Because there would be no adverse effects on archaeological resources, historic architectural properties, or TCPs, there would be

no significant impacts on cultural resources from implementation of Alternative 1, Alternative 2, or Alternative 3.

The Navy has consulted with the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe and with the State Historic Preservation Officer (SHPO), Washington Department of Archaeology and Historic Preservation (DAHP) on the Proposed Action and potential impacts on cultural resources under Section 106 of the National Historic Preservation Act (NHPA). On April 25, 2016, DAHP concurred with the Navy's determination of No Adverse Effect on cultural resources.

American Indian Traditional Resources

During construction of Alternative 1, Alternative 2, or Alternative 3, construction vessels would be in waters not typically used for tribal fishing by the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, or Port Gamble S'Klallam Tribe and would not substantially alter transit to fishing areas in Port Angeles Harbor or the Strait of Juan de Fuca. Underwater noise from pile driving, changes in prey availability, and turbidity would temporarily reduce the number of marine fish in the project area. However, most piles would be installed with vibratory pile drivers so impacts on the quantity of harvestable marine resources in the project area would be temporary and not extend beyond the duration of in-water construction. Under Alternative 1, Alternative 2, and Alternative 3, the inner Ediz Hook shoreline and aquatic tidelands and bedlands offshore from USCG AIRSTA/SFO Port Angeles would be altered. Overwater and seabed coverage would occur in areas not typically used by the tribes for fishing, and would not substantially reduce the size of known harvest areas or the quantity of harvestable marine resources. The overwater structures would shade eelgrass and other marine vegetation, and result in a reduction and degradation in marine habitat. As a result of government-to-government consultations, the Navy and S'Klallam tribes entered into a Memorandum of Agreement that provided mitigation for the impacts of the Proposed Action on tribal treaty rights and resources.

Socioeconomics

Alternative 1 would generate an estimated $27 million in construction costs, and would add an estimated 267 jobs to the local economy over the construction period. Economic output is estimated at $10.5 million in wages, $2.6 million in federal taxes, and $1.7 million in state and local taxes. Most construction positions are expected to be filled locally, and induced effects on spending for goods and services would provide an overall benefit to the local and regional economy. Construction could potentially benefit minority and low income populations from increased employment opportunities and construction workers spending money at minority-owned establishments. The construction of Alternative 2 would take place over a shorter period; however, construction costs would be higher ($30.7 million) and construction would add an estimated 304 jobs, $12 million in wages, $2.9 million in federal taxes, and $1.9 million in state and local taxes to the local and regional economy. Alternative 3 would cost the most and have the greatest benefits to the area economy. Construction costs are estimated at $33.6 million, and would create an estimated 332 jobs, $13.1 million in wages, $3.2 million in federal taxes, and $2.1 million in state and local taxes.

Alternative 1 would have annual operation costs estimated at $180,000. Estimated long-term impacts include annual wages of about $72,000 and an economic output of about $274,000 annually. Operation could generate $17,498 annually in federal taxes and $12,770 in state and local taxes. This would provide an overall long-term benefit to the local and regional economy. Alternative 2 would have slightly higher annual operating costs of $220,000 per year, would create annual wages of about $88,000, would generate an economic output of about $335,000 annually, and would generate $21,386 in federal taxes and $15,609 in state and local taxes.

Alternative 2 would result in a slightly greater economic benefit to the area economy than Alternative 1. Alternative 3 would have the same operating costs and benefit to the area economy as Alternative 2.

Under Alternative 1, Icicle Seafoods would need to remove fish from their commercial fish pens during impact pile driving, resulting in a loss of 2 months of rearing time at the end of the current 18-month fish production cycle. Early harvest would mean the fish would be smaller in size and may be sold at a lower price. The estimated loss of biomass is approximately 926,100 pounds and would result in a financial loss of up to $3 million by Navy estimates. However, Icicle Seafoods estimates that the direct loss of economic value from an early harvest could exceed $6 million and negatively impact relationships with customers. If an early harvest does not occur or implementation of impact pile driving is delayed and occurs when fish are in the pens, the loss of economic value could exceed $18 million. Additionally, the fish pens would need to remain fallow for approximately 11 weeks (compared to a typical fallow period of roughly 4 weeks), which would delay the next rearing cycle and harvest by 7 weeks, resulting in delayed profit. Reduced revenues to Icicle Seafoods would potentially result in a decrease of revenues to DNR.

Similar effects would be anticipated under Alternative 2, except that the in-water work duration would be shorter (5 weeks compared to18 weeks for Alternative 1) and result in a shorter fallow period for the fish pens. The fish pens would remain fallow for approximately 7 weeks under Alternative 3. The Alternative 3 site is also located farthest away from the fish pens of all action alternatives.

Marine Traffic and Transportation

Alternative 1, Alternative 2, and Alternative 3, would generate a small increase in marine traffic (construction barges, tugs, and small boats) in Port Angeles Harbor during construction. Marine traffic from construction barges, tugs, and small boats is estimated at several trips per week, and would be concentrated in the North Harbor area between the Ediz Hook Boat Launch and the eastern end of Ediz Hook. A restricted construction zone would be established around the in-water construction area with floating barriers and signage to prevent other marine traffic from accessing the area. Other than those operated by Icicle Seafoods, no commercial vessels currently operate in close proximity to the construction zone, and Icicle Seafoods would still be able to access its floating fish pens, so the restricted construction zone would have no impact on commercial marine traffic in Port Angeles Harbor. Under Alternative 1, a small portion of the Icicle Seafoods fish pens would be located inside the NVPZ for moored BVs; under Alternative 2, a portion of Icicle Seafoods and of the Puget Sound Pilots Station would be inside the NVPZ for moored BVs. Icicle Seafoods vessels and Puget Sound Pilots vessels would normally be permitted to transit within the NVPZ as defined in 33 Code of Federal Regulations (CFR) 165.2015, and the NVPZ would not substantially affect their operations. Under Alternative 3, neither the Icicle Seafoods fish pens nor the Puget Sound Pilots Station would be within the NVPZ for moored BVs. Alternative 1, Alternative 2, and Alternative 3 would have no long-term effect on commercial marine traffic because commercial vessels do not currently use the North Harbor area for transit or moorage.

Shore Traffic and Circulation

Alternative 1, Alternative 2, and Alternative 3 would all generate increased traffic during construction, primarily on Ediz Hook Road. Construction traffic is expected to be concentrated at the start and end of each workday as workers travel to and from the site. This could cause some minor, periodic, short-term congestion at the Ediz Hook Boat Launch located 180 feet west of the controlled entrance gate to USCG AIRSTA/SFO Port Angeles. To avoid congestion at the boat launch, construction vehicles would not stop within a 100-yard zone on the west side of the

boat launch as they wait to clear the entrance gate, and would wait on the shoulder of the road to allow users unrestricted access to the boat launch. The construction contractor would coordinate with the City of Port Angeles to prepare a Traffic Control Plan to minimize delays of traffic traveling to or accessing the boat launch. Under operation of Alternative 1, Alternative 2, and Alternative 3, up to 20 to 30 additional personnel would be present at USCG AIRSTA/SFO Port Angeles for short periods of time. These personnel would not have use of personal vehicles, but up to eight government vehicles would be available for their use. These vehicles would have no measurable effect on traffic on Ediz Hook Road or other area roadways, would not create new congestion at the entrance to USCG AIRSTA/SFO Port Angeles or access points to other land uses on Ediz Hook Road, and would not affect traffic flow.

Visual Resources

Under Alternative 1, Alternative 2, and Alternative 3, construction would cause temporary visual disturbance to the landscape due to the changing nature of the views as construction proceeds. Under Alternative 1, construction would occur approximately 2,150 feet east of the closest public viewpoint on land (public access areas outside of the USCG AIRSTA/SFO Port Angeles entrance gate); intervening facilities and activities at the Ediz Hook Boat Launch and Puget Sound Pilots Station would dominate views from this location, so the overall degree of visual disturbance would be small. Visual impacts would be greater under Alternative 2 due to its proximity (approximately 350 feet) to the closest public viewpoint. Under Alternative 3, construction would be over 5,200 feet east of the closest public viewpoint on land and would be largely obscured by intervening facilities and the curve of the shoreline. Upon full build-out, Alternative 1, Alternative 2, and Alternative 3 would all result in relatively small visual changes to the inner Ediz Hook shoreline and nearshore. The visual changes would be most noticeable under Alternative 2, which is closest to the land-based public viewpoint to the west of the project site, less noticeable under Alternative 1, and barely noticeable under Alternative 3 due to intervening facilities and the curve of the shoreline. The project alternatives would all cause minor increases in visual clutter from water-based viewpoints in Port Angeles Harbor. Visual changes would be barely detectable from the Port Angeles waterfront. None of the project alternatives would obscure distant views or visibly alter the character of the viewshed. The overall visual character of all alternatives would be consistent with the existing visual character of the inner east end of Ediz Hook and would be compatible with the City of Port Angeles' visual resource goals. There would be no significant impacts on visual resources.

Solid Waste and Hazardous Materials

Construction of the upland facilities under all action alternatives would require the demolition and removal of pavement next to the CPO mess, site excavation for installing the underground sewage storage tank and utilities, minimal site grading, and removal and relocation of signage. These activities would generate construction wastes such as asphalt, concrete, metal, wood, and excess excavated soil. Similarly, in-water construction would generate various solid wastes including concrete and scrap wood. A variety of hazardous materials would be used in construction and activities such as painting of upland facilities, and the use and maintenance of construction equipment are expected to produce small quantities of hazardous waste including spent solvents, waste paint and paint thinner, used lubricating oil, and engine oil. There is some potential for spills during overwater work; however, BMPs would be in place to prevent or minimize spills, and a Spill Prevention Plan would be implemented during construction with materials on hand to prevent the spread of spills and clean up spills.

The types of hazardous materials used and solid waste generated under Alternative 1, Alternative 2, and Alternative 3 would be similar to those currently used/generated at other facilities on USCG AIRSTA/SFO Port Angeles. Existing policies and practices at the base

minimize the generation of waste that must be disposed of and maximize the use of material that can be recycled. USCG AIRSTA/SFO Port Angeles personnel are trained in the handling and storage of hazardous materials, and in operations that use hazardous materials such as fueling vessels, and the base is equipped with facilities to safely store hazardous materials. Existing base policies, practices, and procedures would apply to operational and maintenance activities under all alternatives, and there would be no significant impacts on solid waste and hazardous materials under any of the project alternatives.

Public Involvement

The National Environmental Policy Act (NEPA) requires that environmental information supporting a decision be made available to the public, agencies, other stakeholders, and tribes. The Navy's public involvement process for the Proposed Action is designed to inform stakeholders (which, for this project, include regulatory agencies, elected officials, non-government organizations, and the general public) of the Navy's Proposed Action early in the NEPA process, to provide stakeholders with the opportunity to comment on the Navy's Proposed Action and assessment of the Proposed Action, and to keep the public, agencies, other stakeholders, and tribes informed throughout the NEPA process.

The Navy issued a Description of the Proposed Action and Alternatives (DoPAA) on January 24, 2015 and solicited public and agency comments during a scoping period from January 24, 2015 through February 25, 2015, with a Notice of Availability (NOA) published in the local newspaper (*Peninsula Daily News*). The DoPAA was also posted on the internet for review and comment. The Navy and USCG hosted a public meeting on the DoPAA in Port Angeles on February 5, 2015 to provide information about the Proposed Action and receive public comments.

The Navy made the Draft EA available for public and agency comment from November 30, 2015 to January 28, 2016. During this review period, the Navy and USCG hosted a public meeting in Port Angeles on January 12, 2016 to present the findings of the analysis, answer questions, and receive public comments.

Conclusion

Implementation of Alternative 1, Alternative 2, or Alternative 3 would not constitute a major federal action significantly affecting the quality of the human environment. The potential for a substantial economic impact on a local aquaculture operation does not require the preparation of an EIS pursuant to 40 CFR 1508.14, which states that economic or social effects are not intended by themselves to require preparation of an Environmental Impact Statement (EIS). Therefore, this EA supports a Finding of No Significant Impact for the Proposed Action, and the preparation of an EIS is not warranted or required.

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ENVIRONMENTAL ASSESSMENT

Pier and Support Facilities for Transit Protection System at U.S. Coast Guard Air Station/Sector Field Office Port Angeles, Washington

Contents

Appendices

List of Figures

List of Tables

Abbreviations and Acronyms

°F	degree(s) Fahrenheit
AFF	Alert Forces Facility
AIRSTA/SFO	Air Station/Sector Field Office
APE	Area of Potential Effects
AT/FP	Anti-Terrorism/Force Protection
B-0	Bravo-Zero
BA	Biological Assessment
BA-EFHA	Biological Assessment and Essential Fish Habitat Assessment
BMPs	Best Management Practices
BV	Blocking Vessel
CAA	Clean Air Act
Caltrans	California Department of Transportation
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CPB	Coastal Patrol Boat
CPO	Chief Petty Officer
CPS	Coastal-Puget Sound
CSL	Cleanup Screening Levels
CSO	combined sewer overflow
CT	census tract
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
dB	decibel(s)
dB re 1µPa	decibel(s) referenced 1 microPascal
dBA	A-weighted decibel(s)
DFM	diesel fuel, marine
DNR	Department of Natural Resources
DoD	Department of Defense
DOI	Department of the Interior
DoPAA	Description of the Proposed Action and Alternatives
DPS	Distinct Population Segment
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EDNA	Environmental Designation for Noise Abatement
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EHW-2	Explosives Handling Wharf
EIS	Environmental Impact Statement
EIS/OEIS	Environmental Impact Statement/Overseas Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPP	Environmental Protection Plan
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEIS	Final Environmental Impact Statement
FHWA	Federal Highway Administration
FHWG	Fisheries Hydroacoustic Working Group
FMC	Fishery Management Council

FMP	Fishery Management Plan
ft^2	square foot/feet
g	gram(s)
GHG	greenhouse gas
HAPC	Habitat Areas of Particular Concern
HC	Hood Canal
HRMP	Harbor Resources Management Plan
Hz	hertz
IH	Industrial Heavy
IHA	Incidental Harassment Authorization
IMPLAN	Impact Analysis for Planning (model)
km	kilometer(s)
km^2	square kilometer(s)
lb	pound
L_{dn}	day-night average level
LEED	Leadership in Energy and Environmental Design
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Noise Level
L_{min}	Minimum Noise Level
LOS	level of service
L_{peak}	Peak Sound Pressure Level
LWD	large woody debris
m	meter(s)
m^2	square meter(s)
MBTA	Migratory Bird Treaty Act
MFPU	Maritime Force Protection Unit
mg/L	milligrams per liter
MHHW	Mean Higher High Water
MLLW	mean lower low water
MMPA	Marine Mammal Protection Act
MSA	Magnuson-Stevens Fishery Conservation and Management Act
NAGPRA	Native American Graves Protection and Repatriation Act
NAVBASE	Naval Base
NAVFAC	Naval Facilities Engineering Command
NAVMAG	Naval Magazine
NAVSEA	Naval Sea Systems Command
Navy	U.S. Department of the Navy
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NTU	Nephelometric turbidity unit
NUWC	Naval Undersea Warfare Center
NVPZ	Naval Vessel Protection Zone
NWTRC	Northwest Training Range Complex
NWTT	Northwest Training and Testing
N_2O	nitrous oxide
OFM	Office of Financial Management
OPNAVINST	Chief of Naval Operations Instruction
OSHA	Occupational Safety and Health Act or Administration
oz	ounce/ounces
PacFIN	Pacific Fisheries Information Network
PAMC	Port Angeles Municipal Code

PBP	Public Buildings and Parks
PCBs	polychlorinated biphenyls
PCE	Primary Constituent Element
PFMC	Pacific Fishery Management Council
PLP	potentially liable party
PoPA	Port of Port Angeles
PS	Puget Sound
psf	pound(s) per square foot
PSHSC	Puget Sound Harbor Safety Committee
PSO	protected species observer
PSSTRT	Puget Sound Steelhead Technical Recovery Team
PSTRT	Puget Sound Technical Recovery Team
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RMS	root mean square
ROI	Region of Influence
RSA	Ready Service Armory
RV	Reaction Vessel
SAR	search and rescue
SCO	Sediment Cleanup Objective
SDEIS	Supplemental Draft Environmental Impact Statement
SEAFAC	Southeast Alaska Acoustic Measurement Facility
SEL	Sound Exposure Level
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SMP	Shoreline Master Program
SMS	Sediment Management Standards
SPCC	Spill Prevention, Control, and Countermeasures
SPL	sound pressure level
SRKW	Southern Resident killer whale
SSBN	Fleet Ballistic Missile Submarine
SV	Screening Vessel
SV-33	33-foot Screening Vessel
SV-64	64-foot Screening Vessel
SWMMWW	Stormwater Management Manual for Western Washington
SWPPP	Stormwater Pollution Prevention Plan
TCP	traditional cultural property
TMDL	total maximum daily load
TPS	Transit Protection System
U&A	Usual and Accustomed
UFC	United Facilities Criteria
U.S.	United States
U.S.C.	U.S. Code
USACE	U.S. Army Corps of Engineers
USCG	United States Coast Guard
USCGC	United States Coast Guard Cutter
USFWS	United States Fish and Wildlife Service
USS	United States Ship
VCA	Vegetation Conservation Area
VTSPS	Vessel Traffic Service Puget Sound
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WWTP	Wastewater Treatment Plant

1.0 Purpose of and Need for the Proposed Action

1.1 Introduction

The United States (U.S.) Department of the Navy (Navy) has prepared this Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [U.S.C.] §4321–4370h), as implemented by the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500 to 1508); Navy regulations for implementing NEPA (32 CFR Part 775); and Chief of Naval Operations Instruction (OPNAVINST) 5090.1D, *Environmental Readiness Program* (Navy 2014a).

The Navy proposes to construct a pier and upland support facilities for the Transit Protection System (TPS) at U.S. Coast Guard (USCG) Air Station/Sector Field Office Port Angeles (AIRSTA/SFO Port Angeles) located in the City of Port Angeles, Washington. See Chapter 2 for a detailed description of the Proposed Action and alternatives.

Due to the attack on the USS COLE in 2000, security is a concern for U.S. bases and assets. The Navy continues to increase security to protect its assets and critical support facilities, including its Fleet Ballistic Missile Submarines (SSBNs). The Navy substantially increased security for in-transit SSBNs by establishing a TPS that relies on the use of multiple escort vessels.

The TPS mission is to provide security escort to SSBNs along their transit route between their homeport at Naval Base (NAVBASE) Kitsap Bangor in Hood Canal to the points where the submarines dive or surface in the Strait of Juan de Fuca (submarines travel on the surface to and from their dive/surface points in the Strait of Juan de Fuca and NAVBASE Kitsap Bangor) (Figure 1-1). USCG personnel or civilian mariners man and operate the Navy's TPS vessels. The military personnel are known as the Maritime Force Protection Unit (MFPU). The TPS utilizes up to nine Navy vessels including Blocking Vessels (BVs) (250-foot), a Coastal Patrol Boat (CPB)/Reaction Vessel (RV) (87-foot), and Screening Vessels (SV-64s and SV-33s) (64-foot and 33-foot, respectively).

The USCG is authorized by 14 U.S.C. 91 to control the anchorage and movement of vessels operating near a Navy vessel. As such, the USCG has implemented provisions to establish and enforce a Naval Vessel Protection Zone (NVPZ) (33 CFR 165.2015) and Security Zone (33 CFR 165.1327).

The USCG has agreed to be a cooperating agency for this EA because of its jurisdiction by law and special expertise regarding the Proposed Action.

1.2 Location

The project site is located on the northern coast of the Olympic Peninsula approximately 60 miles northwest of downtown Seattle, Washington (Figure 1-2). USCG AIRSTA/SFO Port Angeles is located at the eastern end of the Ediz Hook peninsula. Ediz Hook lies entirely within the city limits of Port Angeles, Washington, which had an estimated population of 19,448 in 2015.

Established in 1935, USCG AIRSTA/SFO Port Angeles is the USCG's oldest consistently operating air station in the nation. USCG AIRSTA/SFO Port Angeles is responsible for maritime law enforcement and coastal waterway security, search and rescue (SAR) operations, private and commercial boating and fishing safety, and maritime environmental protection. Its general operation area ranges from south of Whidbey Island to the eastern portions of the Strait of Juan de Fuca and the northwestern coast of the Olympic Peninsula.

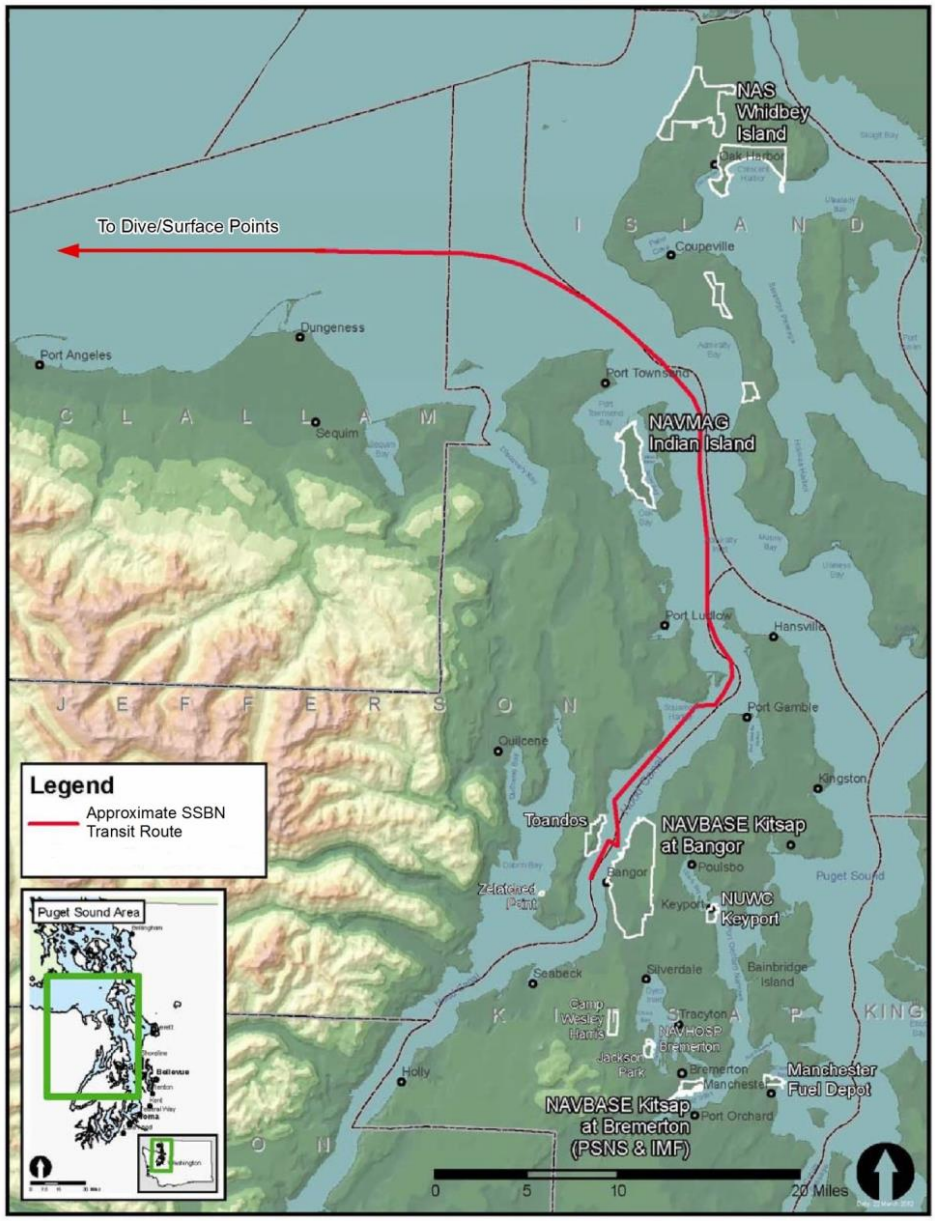

Figure 1-1. Approximate SSBN Transit Route through Puget Sound and Strait of Juan de Fuca

USCG AIRSTA/SFO Port Angeles has a 4,500-foot by 150-foot asphalt runway and 100-foot by 100-foot asphalt helipad dedicated to USCG use. The base supports three full-time MH-65C dolphin helicopters with hangar and aircraft support facilities. A T-shaped pier (T-Pier) provides berthing for USCG AIRSTA/SFO vessels. There is a complex of support buildings including a two-story group building, warehouse, maintenance building, retail exchange, medical/dental clinic, and officers lounge (Figure 1-3). USCG AIRSTA/SFO Port Angeles provides personnel, supply, administration, naval and civil engineering, communications, and other support functions. More than 250 USCG personnel in seven units are assigned to the base. Access to USCG AIRSTA/SFO Port Angeles is via Marine Drive and Ediz Hook Road. The entrance to the base is controlled through a gate and guardhouse with security fencing.

Figure 1-2. Vicinity Map

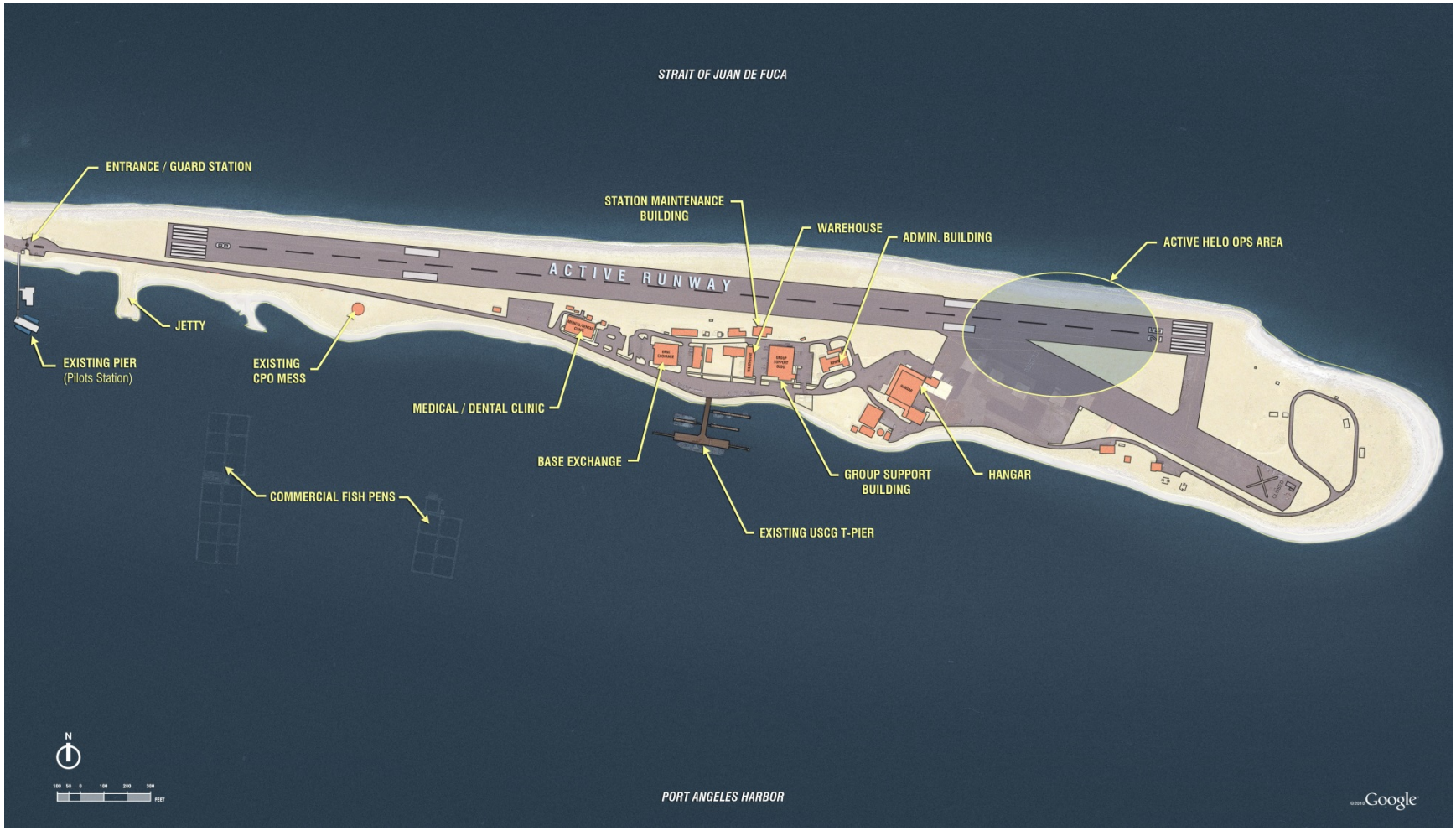

Figure 1-3. USCG AIRSTA/SFO Port Angeles Area Map

Ediz Hook is a narrow spit of land, with widths ranging from 90 to 750 feet, which juts 3.5 miles into the Strait of Juan de Fuca and forms the northern boundary of Port Angeles Harbor. Most of Ediz Hook outside of USCG AIRSTA/SFO Port Angeles is owned by the federal government and leased long-term to the City of Port Angeles.

1.3 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to provide a staging location for TPS vessels and crews that escort Navy submarines to and from their dive/surface points in the Strait of Juan de Fuca and NAVBASE Kitsap Bangor. The Proposed Action is needed to comply with USCG requirements for underway hour limits and required crew rest between escort missions. Underway hours are defined as the time required for USCG crews to prepare for, perform, and complete small boat operations. The hour limits vary by boat size and type, and are shorter during high sea states and foul weather conditions.

1.3.1 Current Operations

TPS vessels and personnel have operated out of temporary facilities and piers at the Port of Port Angeles (PoPA) and USCG AIRSTA/SFO Port Angeles since 2006, which greatly limits their operational capability and efficiency. There is currently no dedicated berthing for any of the TPS vessels at Port Angeles and no dedicated facility for overnight crew accommodations and mission planning.

The BVs berth at the PoPA Terminals 1 and 3 on a space-available basis. In the past, Terminal 7 was used occasionally but was recently declared unavailable due to its deteriorating condition. BVs also occasionally berth at USCG AIRSTA/SFO Port Angeles if the USCG Cutter (USCGC) Active berth at the T-Pier is available. The SVs berth at the PoPA Boat Haven Marina at the transient pier on a space-available basis, with small-arms storage at USCG AIRSTA/SFO Port Angeles. The RV-87 CPB berths at the USCG AIRSTA/SFO Port Angeles Cutter floats when they are deployed, or at a mooring ball in the harbor.

Under current conditions, USCG crews are unable to operate at full capability. Crews are routinely pushed to their endurance limits for multiple days at a time since there is no facility for crew overnight accommodations or operations planning. Waivers must be frequently granted to meet back-to-back missions, multiple schedule changes, and the effects of adverse weather conditions to maintain national strategic requirements and meet safety policies and regulations. Granting of waivers is not sustainable in the long term. In addition, vessels expend significant amounts of fuel and time in transit to and from NAVBASE Kitsap Bangor and the dive/surface points.

There are a number of operational and cost advantages to having a facility in Port Angeles that stages the escort vessels in proximity to the dive/surface points in the Strait of Juan de Fuca. For example, the minimum turnaround times for missions can be reduced if crews and vessels do not have to return to NAVBASE Kitsap Bangor between missions, and fuel consumption can be significantly reduced. Accordingly, a dedicated facility in Port Angeles would enable crews to fulfill the mission of providing security support for transiting SSBNs within the policy and safety requirements established for the TPS.

1.4 Scope of Environmental Analysis

The environmental analysis presented in this EA focuses on the specific environmental resources and topics that could reasonably be affected by the Proposed Action. Only those resources with a potential for impacts are analyzed in this EA. The environmental resource

areas analyzed in this EA include: land use and recreation, water quality and sediments, biological resources, noise, cultural resources, American Indian traditional resources, socioeconomics, marine traffic and transportation, shore traffic and circulation, visual resources, and solid waste and hazardous materials.

The impacts of TPS vessel movement activities are addressed in the *Northwest Training and Testing Final Environmental Impact Statement/Overseas Environmental Impact Statement* (NWTT FEIS; Navy 2015). The impact analysis documented in the NWTT FEIS identified the potential for minor impacts to American Indian traditional resources, transportation and shipping, commercial and recreational fishing, and tourism associated with the presence of security zones surrounding Navy vessels during transit. Recreational and commercial vessels would be required to move outside of the security zone for up to 15 minutes until the transiting vessels have passed. This EA evaluates the TPS vessels when they are moored at USCG AIRSTA/SFO Port Angeles, and includes activities such as fueling and maintenance. For the purposes of this EA, the term “operations” is defined as any long-term activities related to the moored TPS vessels, and use of the upland facilities following completion of construction of the project.

Because potential impacts to the following resources were considered to be negligible or nonexistent, they were not evaluated in this EA:

- **Wetlands.** No wetlands are present in the vicinity of the Proposed Action. Note that eelgrass beds are discussed in the Biological Resources section.
- **Air Quality.** Effects on air quality from the implementation of the Proposed Action would be negligible due to the classification of attributed air sources and the attainment designation of Clallam County in relation to the National Ambient Air Quality Standards (Clallam County is not designated as a non-attainment or maintenance area). As described in 40 CFR Part 93, *Determining Conformity of General Federal Actions to State or Federal Implementation Plans* (the "General Conformity Rule"), federal actions occurring in air basins designated in nonattainment or in a maintenance area must conform to an applicable implementation plan. Since Clallam County is designated an attainment area for all criteria pollutants, the General Conformity Rule does not apply. The activities associated with the Proposed Action are limited to mobile sources and sources excluded from Notice of Construction requirements per Olympic Region Clean Air Agency regulations; therefore, New Source Review and Prevention of Significant Deterioration requirements do not apply.
- **Public Safety**. USCG AIRSTA/SFO Port Angeles is restricted from public access; during construction of the Proposed Action, floating barriers and construction signage would be used to keep vessels out of the construction zone. Construction contractors and Navy and USCG employees would be required to adhere to all applicable regulations to protect public safety. Children would be restricted from access to the construction area. The construction of a pier and upland facilities would not cause environmental health or safety risks, such as products and substances that children could come in contact with, or ingest, that may disproportionately affect children. Due to the NVPZ (see Section 2.7) around large Navy vessels, recreational boaters sailing from the Ediz Hook Boat Launch to the Strait of Juan de Fuca would be required to navigate in deeper waters in the harbor when the BVs are moored at the proposed pier. However, because these vessels are typically headed to much rougher sea states in the Strait, the impact on boater safety when navigating in the harbor is negligible. Therefore, the activities described under the Proposed Action would have a negligible impact on health and safety of the public,

children, construction contractors, Navy and USCG employees, and recreational boaters with adherence to construction and navigation safety standards.

- **Utilities and Infrastructure**. The City of Port Angeles provides wastewater services, potable and fire water flow, and electrical power to USCG AIRSTA/SFO Port Angeles. Construction of the Proposed Action would connect new utility lines to existing lines on USCG AIRSTA/SFO Port Angeles (i.e., new potable water, wastewater, and electrical utility lines providing services to the proposed pier, Alert Forces Facility [AFF], and the Ready Service Armory [RSA] would tie in to existing lines). Operation of the proposed TPS pier and upland facilities would create a negligible increase in demand on wastewater, potable water, and electrical services when the TPS vessels are staged at USCG AIRSTA/SFO Port Angeles.

1.5 Relevant Laws and Regulations

In addition to NEPA, CEQ, and Navy regulations, the Navy has prepared this EA in compliance with other federal and state laws, statutes, regulations, and policies that are relevant to the implementation of the Proposed Action including, but not limited to, the following:

- Clean Air Act (CAA) (42 U.S.C. 7401 et seq.)
- Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.)
- Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801–1884)
- Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712)
- Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d)
- Clean Water Act (CWA) Sections 404, 401, and 311 (33 U.S.C. 1251 et seq.)
- River and Harbors Act (33 U.S.C. 407)
- Coastal Zone Management Act (CZMA) (16 U.S.C. 1451 et seq.)
- National Historic Preservation Act (NHPA) (54 U.S.C. 306108)
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. 3001–3013)
- Executive Order (EO) 13175, Consultation and Coordination with Indian Tribal Governments
- EO12088, *Federal Compliance with Pollution Control Standards*
- EO 12898, *Federal Actions to Address Environmental Justice in Minority and Low-income Populations*

A description of the Proposed Action's consistency with these regulations and policies, as well as the regulatory agencies responsible for their implementation, is presented in Chapter 5, *Other Considerations Required by NEPA* (Table 5-1).

1.6 Public Involvement

CEQ regulations direct federal agencies to hold or sponsor public hearings or public meetings whenever appropriate or in accordance with statutory requirements (40 CFR 1506.6). The

following public involvement activities have been or are being conducted as part of the NEPA process (Appendix D):

- **Public Review of the Description of the Proposed Action and Alternatives (DoPAA).** The Navy made the DoPAA available for public review and comment on January 24, 2015 through February 25, 2015 with a Notice of Availability (NOA) published in the local newspaper (*Peninsula Daily News*). The DoPAA was also posted on the internet for review and comment. The Navy and USCG hosted a public meeting on the DoPAA in Port Angeles on February 5, 2015 to provide information about the Proposed Action and receive public comments.

  The Navy received 50 written comments during the public comment period, as well as additional input from agencies and the tribes. A number of comments expressed concern about the proposed alternative locations, especially the location of the eastern and western sites. Reasons for concern varied from noise impacts on the Puget Sound Pilots Station; potential restrictions that might affect boat access; restrictions/impacts on scuba diving at an existing rock pile; potential impacts on existing commercial fish pens; and impacts on eelgrass. The Navy considered all of these comments and proposed a new alternative location, the Midwestern Site, that minimizes project impacts.

- **Public Review of the Draft EA**. The Navy made the Draft EA available for a public review and comment period from November 30, 2015 to January 28, 2016, with an NOA published in the local newspaper (*Peninsula Daily News*). The Draft EA was posted on the internet for review and comment. The Navy and USCG hosted a public meeting on January 12, 2016 to present the findings of the analysis, answer questions, and receive public comments. A total of 26 public comment documents (106 individual comments) were received on the Draft EA during the 60-day public comment period. The Navy reviewed and considered all relevant comments that were received during the public comment period.

- **Release of the Final EA and Decision Document.** The Final EA and decision document will be made available to the public. The NOA will be published in the Peninsula Daily News, and the Final EA and decision document will be posted on the internet.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

The Navy proposes to construct, operate, and maintain a pier and upland support facilities for berthing TPS escort vessels. Support facilities include an AFF (single-story sleeping and administration building); an RSA (an ammunition and small-arms storage facility); a diesel fuel, marine (DFM) storage tank and distribution system; and site improvements including utilities, parking, lighting, security improvements, and landscaping at USCG AIRSTA/SFO Port Angeles to support the TPS mission. The TPS pier would be designed to provide full hotel services (hotel services include electricity, potable water, sewer, internet, phone, fire protection, pier lighting, and fueling lines) and dedicated mooring for up to seven TPS vessels (there would be six berths – the two BVs would be moored side by side). Construction of the project is anticipated to start in the fall of 2016 and last up to 18 months. The new pier and support facilities would have a design life of 50 years.

2.2 Selection Criteria

NEPA's implementing regulations provide guidance on the consideration of alternatives to a federally Proposed Action and require the rigorous exploration and objective evaluation of reasonable alternatives. Only those alternatives determined to be reasonable require detailed analysis. Potential alternatives that meet the purpose and need were evaluated against the following selection criteria, as developed by the Navy:

1. Proximity to the Strait of Juan de Fuca (location of the dive/surface points) to remain within the crew endurance limits.
2. Provide dedicated berthing for TPS vessels 24 hours a day, 7 days a week.
3. Be located on property owned or controlled by the federal government.
4. Comply with physical security requirements for the TPS mission.
5. Avoid adversely impacting existing USCG SAR operations.
6. Ability to utilize existing facilities and utilities infrastructure.
7. Provide personnel support activities for TPS crews including access to recreation, medical/dental services, retail, and other services on the base.
8. Avoid or minimize environmental impacts to the maximum extent practicable.

2.3 Alternatives Considered but Eliminated from Further Analysis

The Navy considered four alternatives that were eliminated from further analysis because they did not meet one or more of the selection criteria.

2.3.1 Existing USCG T-Pier at AIRSTA/SFO Port Angeles Alternative

Under this alternative, the Navy would construct an extension of the existing T-Pier to provide additional berthing for TPS vessels and the 210-foot USCGC Active. The trestle would extend from the T-Pier, and the transfer span would connect the trestle to the floating pontoon. There would also be small boat floating docks. The trestle would be approximately 190 feet by 23 feet and require approximately 20 piles. The transfer span would be approximately 120 feet long and 26 feet wide. The extension of the pier would result in the pontoon being located in deep water (too deep to use piles to anchor the pontoon); thus, the pontoon would be anchored to the

seafloor using a cable-stayed system attached to four anchors. The anchors would be roughly 40 feet in diameter and constructed of concrete.

The Navy eliminated this alternative from further consideration because it failed to satisfy selection criterion 5:

- **Avoid adversely impacting existing USCG SAR operations.** This alternative would require extensive improvements to the existing T-Pier to meet the 50-year design life of the Proposed Action.

The existing wood piling and wood decking and railings would need to be replaced. It is estimated that approximately 50 of the 24-inch wood piles would be replaced with 24-inch steel piles in addition to the wood decking/railings, which would be replaced in kind. Construction of the T-Pier extension and improvements at the T-Pier itself are anticipated to last approximately 2 years. During the period of construction, the T-Pier would not be useable, and USCG boats currently moored there would have to utilize an alternative mooring location.

In accordance with 14 U.S.C. 88, USCG AIRSTA/SFO Port Angeles maintains a SAR mission with an area of responsibility that covers the central and eastern Strait of Juan de Fuca, from Pillar Point to the southern tip of Whidbey Island. The Station responds to approximately 75 SAR cases and performs an average of 200 law enforcement boardings each year. It is the only "on-call" USCG small-boat station within a 70-mile radius and is designated as a heavy weather station, meaning that small-boat coxswains and crew members may operate or launch for missions, if properly qualified, when wave heights exceed 8 feet and winds speeds are greater than 30 knots.

USCG AIRSTA/SFO Port Angeles has an established readiness requirement of Bravo-Zero (B-0) for its available small boats. Small boat refers to any USCG vessel less than 65 feet in length. USCG AIRSTA/SFO Port Angeles has a complement of 45-foot and 25-foot response boats. Boats are usually manned by a crew of 3 to 5 qualified members that are responsible for various aspects of the boat or have particular responsibilities during a mission.

To maintain a B-0 alert status, a USCG unit must be able to get underway within 30 minutes of notification of a case. This means that within the 30 minutes, the boat crew must assemble; receive an operations and weather brief with all available information; make crew assignments; retrieve and put on law enforcement equipment and cold-weather/water gear; retrieve and load weapons; complete a risk assessment; retrieve radios and pyrotechnic gear and conduct necessary pre-mission checks; get to the boat(s); conduct lift-offs by starting all the engines; electrical, and mechanical systems on the boat; conduct boat checks and communications checks; and get underway. The average time for boat crews to get underway at USCG AIRSTA/SFO Port Angeles typically ranges from 22 to 25 minutes depending on mission complexity, time of day, crew experience, season, and prevailing weather.

As noted above, construction of this alternative would require the relocation of USCG boats throughout the approximately 2-year period of construction. The nearest suitable mooring location for the USCG small boats is the Boat Haven Marina, which is owned and operated by the PoPA. Relocation of USCG boats would prevent USCG AIRSTA/SFO Port Angeles small boats from meeting their required B-0 response times and adversely impact existing USCG SAR operations. Key factors affecting response times include:

- Boat Haven Marina, owned and operated by the PoPA, is located southwest of the USCG facility, approximately15 minutes away by vehicle. The added time to travel from USCG AIRSTA/SFO Port Angeles to the Boat Haven Marina, coupled with the average

time to get underway of 22 to 25 minutes, would not allow for the required 30-minute response.

- Transport of pyrotechnics, weapons, and ammunition to and from the moorings would also require more time. Each of these items has to be retrieved from its storage location, made ready, and stored back on the boat before getting underway.
- Response to a SAR case is currently handled by a minimally manned duty section. There are currently no extra personnel to serve as duty drivers or help move and load gear. Relocating USCG boats to the Boat Haven Marina would degrade mission readiness by requiring additional personnel for each shift to support the logistical requirements to load and transport the response crews.
- Additional considerations include fueling, the ability to conduct post-mission maintenance, fatigue factors and driving after a mission, parking, and security, all of which could increase the required rest times between missions.

2.3.2 Port of Port Angeles Alternative

The Navy considered use of the Port of Port Angeles facilities for the TPS vessels to include support facilities. This included leasing Terminal 7 for mooring the TPS vessels and leasing adjacent buildings to serve as the AFF and RSA.

The Navy eliminated this alternative from further consideration because it failed to satisfy selection criteria 3, 4, and 6:

- **Be located on property owned or controlled by the federal government.** Department of Defense (DoD) and Navy policy require that the Navy may lease property only if there is no DoD or government-owned or controlled real property available that can adequately support the approved military requirement (Naval Facilities Engineering Command [NAVFAC] Real Estate Procedural Manual, P-73 [Navy 2013]). Additionally, USCG and Navy policy prohibits the siting of an RSA on property not owned or controlled by the federal government.
- **Comply with physical security requirements for the TPS mission.** Use of Terminal 7 for TPS vessel mooring would not meet the shore-side security requirements for restricting access at all potential public access points. Additionally, enforcement of the existing NVPZ around the 250-foot BVs would prohibit boats and personnel from traveling within 300 feet of the vessels when moored (33 CFR 165.2030). The NVPZ could shut down use of the public boat launch at Boat Haven Marina while TPS vessels are moored. The facilities that would be used as the AFF and RSA would not meet Navy security requirements such as access controls, Anti-Terrorism/Force Protection (AT/FP) stand-off distances, security fencing, signage, manned closed-circuit television surveillance, and intrusion detection.
- **Ability to utilize existing facilities and utilities infrastructure.** The infrastructure available does not meet Navy security requirements. In addition, mooring some TPS vessels at the Boat Haven Marina is infeasible because the proposed area does not meet the maneuverability requirements of the SV-64s.

2.3.3 Naval Magazine Indian Island Alternative

Under this alternative, the Navy would construct a pier and support facilities at Naval Magazine (NAVMAG) Indian Island. NAVMAG Indian Island is approximately halfway between the dive/surface points in the Strait of Juan de Fuca and NAVBASE Kitsap Bangor.

The Navy eliminated this alternative from further consideration because it failed to satisfy selection criterion 1:

- **Proximity to the Strait of Juan de Fuca (location of the dive/surface points) to remain within the crew endurance limits**. Utilization of NAVMAG Indian Island as a forward staging location would add a minimum of one additional hour of underway time for crews, when compared to the Proposed Action. As such, USCG crews would continue to exceed requirements for underway hour limits and not meet the required crew rest between escort missions.

2.3.4 Neah Bay Alternative

Under this alternative, the Navy would construct a pier and support facilities at USCG Station Neah Bay. USCG Station Neah Bay is located on the Olympic Peninsula at the entrance of the Strait of Juan de Fuca, approximately 65 miles west of Port Angeles. USCG Station Neah Bay is remote and consists of an administration/barracks building, a boathouse, gymnasium, 14 units of family housing, and a helicopter landing pad with fueling facilities. Other than the local community of Neah Bay, the nearest populated area is the twin town area of Clallam Bay and Sekiu, about 15 miles to the east, where available services are limited. The nearest city is Forks, approximately 50 miles to the south.

The Navy eliminated this alternative because it did not satisfy selection criteria 1 and 7:

- **Proximity to the Strait of Juan de Fuca (location of the dive/surface points) to remain within the crew endurance limits**. Because of the distance from Neah Bay to the dive and surface points, utilization of USCG Station Neah Bay as a forward staging location would add from 1 to 4 hours of additional underway time for crews, when compared to the Proposed Action. As such, USCG crews would continue to exceed requirements for underway hour limits and not meet the required crew rest between escort missions.
- **Provide personnel support activities for TPS crews including access to recreation, medical/dental services, retail, and other services on the base**. USCG Station Neah Bay is a small, remotely located installation, does not have medical/dental services or retail services, and has very limited recreational facilities. Under this alternative, USCG personnel operating aboard the TPS vessels would need to travel to USCG AIRSTA/SFO Port Angeles to obtain these services.

2.4 Alternatives

The Navy is currently considering three action alternatives for analysis in this EA that meet the purpose and need. The three action alternatives are located at USCG AIRSTA/SFO Port Angeles. Alternative 1 is the Midwestern Site and its pier is located just to the west of the existing medical/dental clinic and USCG T-Pier. Alternative 2, the Western Site, is located on the west end of USCG AIRSTA/SFO Port Angeles. Alternative 3, the Eastern Site, is located on the east end of the base. The upland facilities are located in close proximity to the piers for each alternative. The location of the alternatives is shown in Figure 2-1.

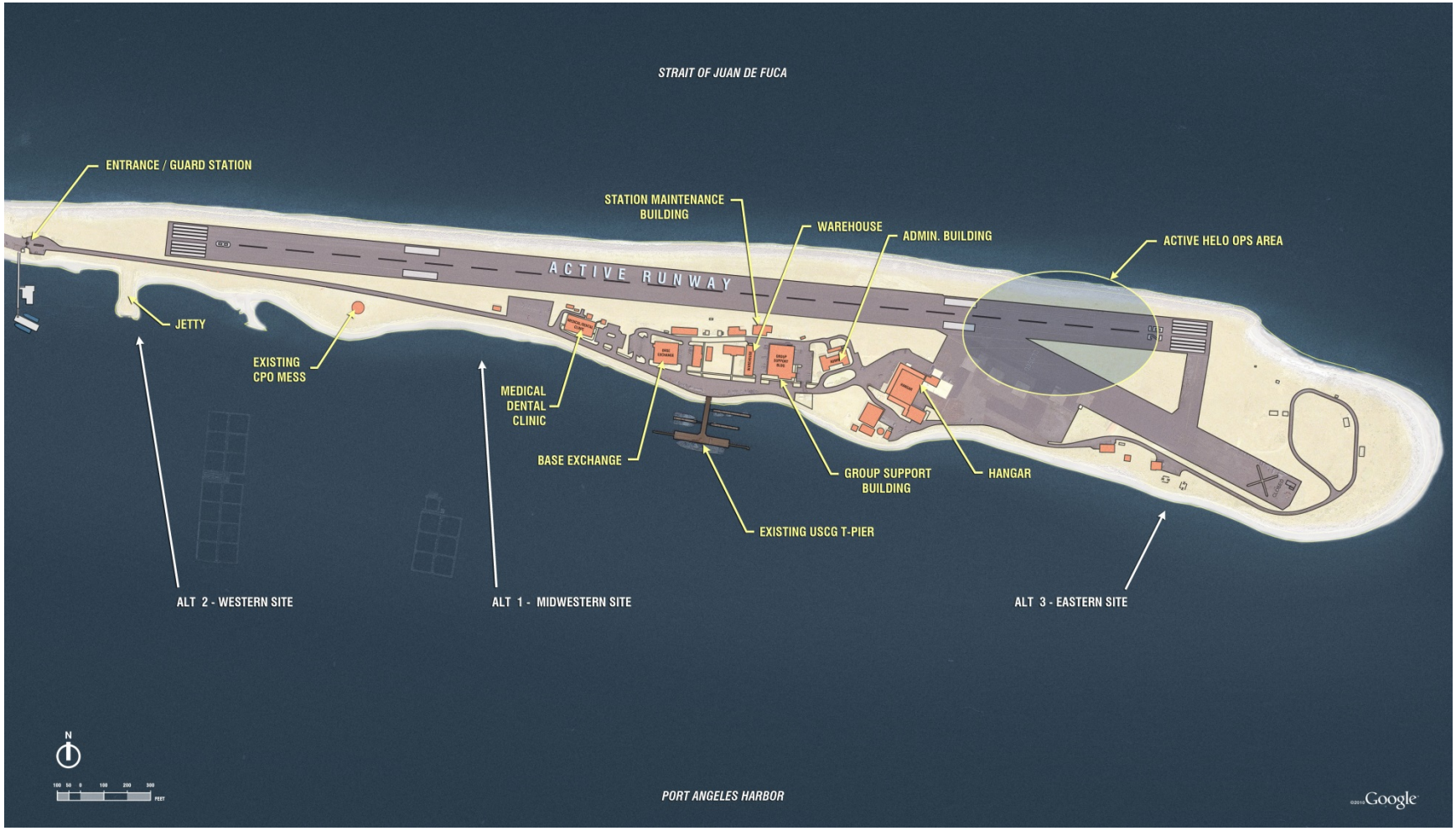

Figure 2-1. Alternative Locations for the Pier and Support Facilities for TPS Project

The three action alternatives have several project elements in common and differ primarily in where they would be located on USCG AIRSTA/SFO Port Angeles. The following project elements are common to all three action alternatives:

- An approach trestle and supporting piles.
- A transfer span.
- Pier structure (floating or fixed, depending on the alternative).
- Full hotel services on the TPS pier (e.g., electrical power, potable water, fire protection, sewer, Ship Overboard Discharge collection, telephone and internet, pier lighting, and fueling lines).
- Dedicated berthing for up to seven TPS vessels.
- An AFF with offices, mission briefing areas, and sleeping facilities for 20 to 30 personnel.
- An RSA for ammunition and small-arms storage.
- Fuel storage and distribution system, including an above ground DFM storage tank.
- Site improvements including utilities, parking, lighting, security improvements, and landscaping.
- AT/FP security features.

Components of the action alternative(s) may be placed on submerged lands owned by the State of Washington and managed by the State Department of Natural Resources (DNR). Under the Submerged Lands Act, the United States may use submerged lands without an underlying interest in the property under the doctrines of navigational servitude and national defense.

The main components of the three action alternatives are described below.

2.4.1 Alternative 1: Midwestern Site (Preferred Alternative)

2.4.1.1 Transit Protection System Pier

The TPS pier under Alternative 1 would be located west of the existing medical/dental clinic and the existing USCG T-Pier (Figure 2-2). (*Note: Figures 2-2, 2-4, and 2-6) are 11x17 inch figures depicting the action alternatives, and are presented at the end of Chapter 2 for comparison and printing purposes.*) There would be a short approach road to the pier from Ediz Hook Road. The TPS pier would consist of a pile-supported approach trestle that extends to a fixed pier for mooring the two BVs, and floating docks for mooring smaller vessels (four SVs and one CPB). The trestle would provide vehicle and pedestrian access to the pier and convey utilities to the pier. The trestle would be approximately 355 feet long and 24 feet wide and constructed of precast concrete (see Figure 2-3). The trestle would be designed to support a 50 pound per square foot (psf) live load or a utility trailer with a total load of 3,000 pounds (lbs). The trestle would be supported by sixteen 18-inch, twelve 24-inch, and eight 36-inch diameter hollow steel pipe piles with concrete caps. The trestle piles would be driven to depths of approximately 75 to 80 feet. The trestle would be constructed between approximately +7 and -45 feet mean lower low water (MLLW).

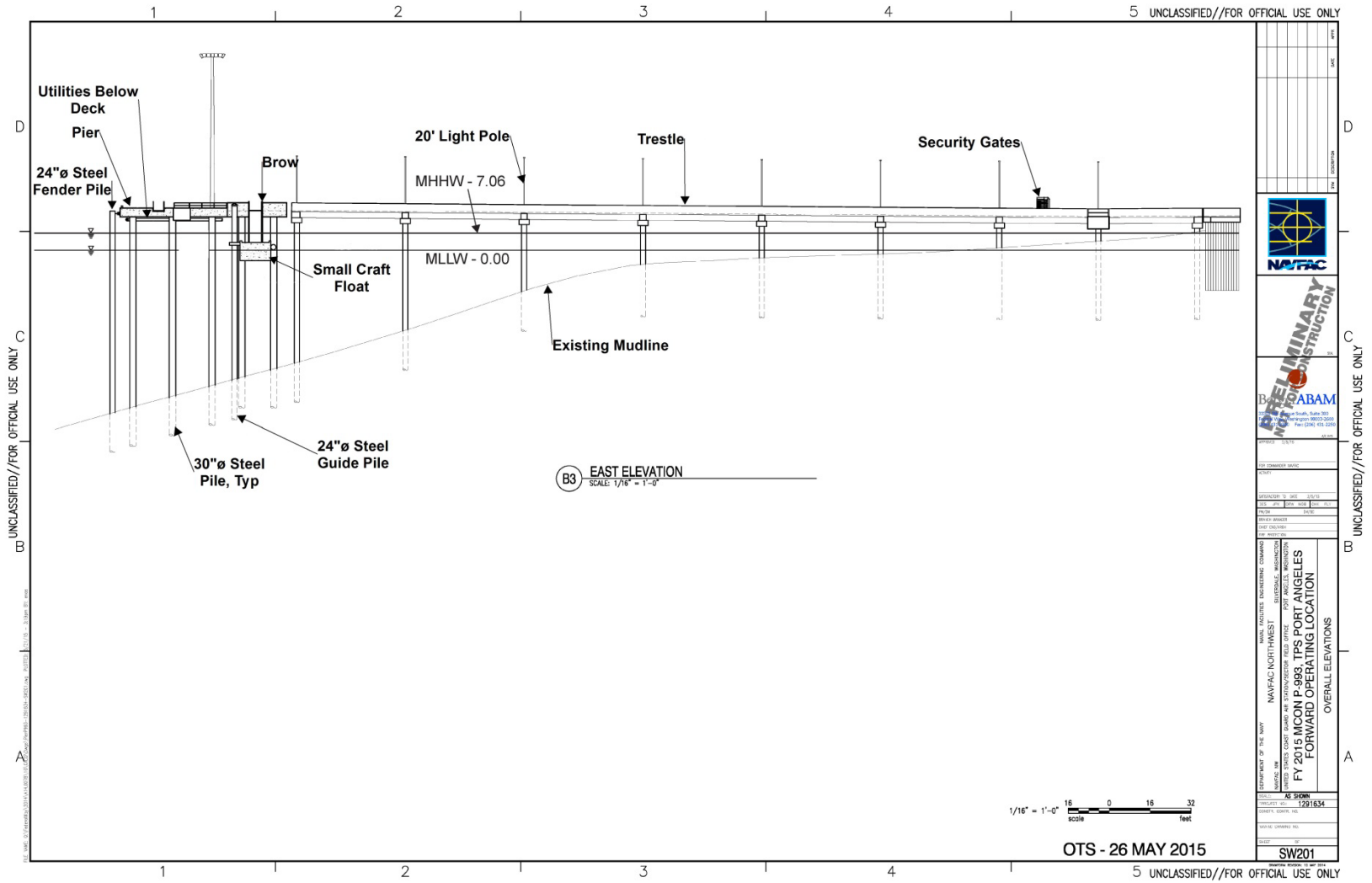

Figure 2-3. Alternative 1 – Trestle, Transfer Span, and Fixed Pier

The fixed pier at the end of the trestle would also be constructed of precast concrete and be approximately 160 feet long and 42 feet wide. The fixed pier would have two mooring dolphins that connect to the fixed pier via a catwalk. The fixed pier would be supported by 87 hollow steel pipe piles including ten 36-inch piles, forty-nine 30-inch piles, and twenty-eight 24-inch piles with concrete caps. The fixed pier piles would be driven to depths of approximately 100 feet. The fixed pier would be constructed between -45 and -63 feet MLLW.

Attached to the fixed pier would be several floats (floating docks) for the smaller TPS vessels. There would be two floats for the SVs on the west side of the pier that would each be approximately 80 feet long and 17 feet wide (see Figure 2-2). They would be connected to each other and the fixed pier by a walkway and transfer span. On the east side of the fixed pier would be a single float for mooring the CPB that would be approximately 120 feet long and 12 feet wide and accessed via a transfer span from the pier. The floats would be anchored by 21 hollow steel pipe piles including three 24-inch piles, six 30-inch piles, and twelve 36-inch piles driven to depths of 70 to 110 feet. The TPS pier would require approximately 80 temporary 24-inch steel indicator piles driven to a depth of 50 feet, which would be installed for approximately one or two weeks.

Near shore, a permanent sheet pile abutment would be constructed on the upland area to protect the trestle connection to the land. This would require approximately 60 steel sheet piles. These would be driven to a depth of 25 feet. The wall would be approximately 110 feet long.

All piles (sheet and pipe piles) would be driven using a combination of vibratory and impact pile driving. Vibratory pile driving, used first, involves hydraulic-powered weights to vibrate a pile until the surrounding sediment liquefies, enabling the weight of the pile plus the pile driver to push the pile into the ground. Once a pile hits “refusal,” which is where hard dense substrate (e.g., gravel, boulders) prevents further pile movement by vibratory methods, impact pile driving is used to drive the pile to depth. Impact hammer pile driving uses a rising and falling piston to repeatedly strike a pile and drive it into the ground. The number of strikes would vary and depend on the substrate at each pile location and the pile size. Under expected conditions, impact pile strikes would not exceed 1,600 per construction day. It is possible that with atypical, highly resistant substrate as many as 7,000 impact strikes could be required in a day, but this would be an unlikely outlier condition. Proofing at the end of installation would be conducted with an impact hammer for one of every three trestle piles and one of every four pier piles. Approximately 200 strikes per pile would be needed for proofing. These 200 strikes are included in the up to 1,600 strikes per day estimate above.

Total overwater coverage of the TPS pier would be 25,465 square feet (ft^2). Nearshore coverage (shallower than -30 feet MLLW) would be 8,650 ft^2. There would be a total of 144 in-water permanent piles that would displace approximately 745 ft^2 of the seafloor.

A security gate with fencing and a vehicle gate and personnel turnstile would be erected across the pier for access control. The security gate would consist of a double vehicle swing gate. A cantilevered section of the trestle would extend out approximately 4 feet for the automated personnel turnstile system. The security fencing would be approximately 7 feet high and topped with barbed wire. Barbed wire would also be placed around the sides and bottom of the gate, which would extend out past the sides of the trestle.

The pier would have full hotel services at each of the six berths including electrical power, potable water, fire protection, sewer, telephone and internet, and fueling lines. The pier would also be equipped with lighting, intrusion detection, mooring, fendering, brows (gangways), corrosion protection systems, and stormwater protection systems.

The trestle and pier are subject to vehicular traffic and are larger than 5,000 ft^2. Therefore, stormwater would be captured and treated in accordance with the Washington State Department of Ecology (Ecology) Stormwater Management Manual for Western Washington (SWMMWW) (Ecology 2012a) prior to being discharged into Port Angeles Harbor, which is intended to achieve a goal of 80 percent removal of total suspended solids for an influent concentration range of 100 milligrams per liter (mg/L) to 200 mg/L. The level of treatment required by Ecology would be Basic Treatment. The fixed approach trestle and fixed pier would be sloped to capture stormwater at low points in the deck. Stormwater would drain to a Basic Treatment device, designed to remove 80 percent of total suspended solids from influent prior to being released directly into Port Angeles Harbor. The small craft floats would only be subject to pedestrian traffic and would not require Basic Treatment. The floats would have fueling operations; therefore, runoff would be captured and routed through a coalescing plate oil/water separator prior to releasing it into Port Angeles Harbor.

The duration of the in-water work (pile driving) would be approximately 18 weeks. Pile driving would occur for approximately 75 days, and between one and eight piles would be driven in any one day. Impact pile driving would occur only between December 1, 2016 and February 15, 2017. Overwater construction would be completed in approximately 15 months. The total construction period would be 18 months. In-water construction for all of the action alternatives would observe the in-water work window (July 16 through February 15) for Puget Sound Tidal Reference Area 10 to minimize impacts on salmon (*Oncorhynchus* spp.) and bull trout (*Salvelinus confluentus*). To comply with the in-water work windows, in-water construction would begin approximately in October 2016 and last through February 15, 2017, begin again starting July 16, 2017, and finish in October 2017.

Sea-level rise due to global warming has been estimated for the Strait of Juan de Fuca and northern Hood Canal area (Petersen et al. 2015). The modeling provides probability estimates for increase in mean sea level, and annual extreme coastal flooding elevations due to predicted storm surges. Probability modeling ranging from 1 percent to 99 percent was done for years 2030, 2050, and 2100. The most conservative scenario developed (highest water) is the 1 percent probability in 2100 for the extreme flood elevation. For the Port Angeles Harbor, one of the focus areas, this was estimated to be 6.8 feet above the existing Mean Higher High Water (MHHW) elevation. A less conservative scenario is the 25 percent probability in 2100 for the extreme flood elevation, which is estimated to be 4.5 feet above the existing MHHW elevation.

The top of the proposed TPS pier deck is 7.99 feet above MHHW at the Alternative 1 site. Therefore, with sea-level rise, by the year 2100 the pier deck is estimated to be a minimum of 1.19 feet above the predicted storm surge levels. The existing roadway leading to the proposed trestle is 4.74 feet above MHHW; therefore, there is an estimated 1 percent probability that it would be submerged during storm surge events, and a 25 percent probability that the roadway would be above sea level. For all probabilities (1 percent to 99 percent) at year 2050, both the pier and adjacent road would be above sea level.

The Alternative 2 and Alternative 3 sites were similarly reviewed using inundation and extreme storm flooded area mapping for the year 2050 presented in Peterson et al. (2015). The projections indicate that sea level rise conditions at the Western Site (Alternative 2) would be similar to those described for Alternative 1. At the Eastern Site (Alternative 3), flooding conditions projected for 2050 would be more extensive, with an estimated 5 percent annual probability of inundation of the south shore of Ediz Hook, indicating that Alternative 3 may be less suitable than Alternatives 1 and 2 with respect to projected sea level rise.

In the event of a tsunami, for all action alternatives personnel at the TPS pier and on TPS vessels docked at the pier would follow the USCG emergency response plan in force at AIRSTA/SFO Port Angeles.

2.4.1.2 Upland Improvements

The upland improvements include development of several facilities including an AFF; RSA; DFM storage tank and fueling facility; and other site improvements (such as new parking areas, utilities, and stormwater facilities), all of which encompass approximately 1.5 acres. These are described in the sections below.

Alert Forces Facility

The AFF would consist of an approximately 8,200 ft^2 single-story building constructed approximately 33 feet to the west of the Chief Petty Officer (CPO) mess building (Figure 2-2). It would have a 100 ft^2 weather vestibule and covered entry. Generally, the AFF would provide offices and temporary living facilities for approximately 20 to 30 personnel including sleeping rooms, bathrooms, lockers and laundry facilities, telecommunications room, kitchen, office spaces, and mission briefing areas. The facility could house up to 56 personnel. The facility would have dedicated electrical power, telephone, and internet. The AFF is anticipated to be constructed with reinforced concrete masonry unit blocks supported by steel columns and beams, and would be approximately 21 feet high. Roofing would consist of metal panels over a gypsum cover board. The area around the AFF would be lighted, and the AFF would be surrounded by gated security fencing.

The facility would displace existing parking spaces for the CPO mess, which would be replaced with new parking areas to the west and east of the AFF and CPO mess. The new parking area west of the building would consist of eight parking spaces. The parking area east of the AFF would consist of 24 parking spaces.

Ready Service Armory

The RSA would be a 10-foot by 20-foot pre-made steel structure with an intrusion detection system used to store small arms and ammunition. The RSA would be located approximately 350 feet west of the AFF (Figure 2-2). A 12-foot by 22-foot concrete pad would be poured and the RSA would be affixed to the pad. A gated security fence would be installed around the RSA.

Fuel Storage and Distribution System

Alternative 1 would include a fuel storage and distribution system to provide a small craft ready fuel supply to the TPS pier. An above-ground 10,000-gallon DFM storage tank would be located approximately 300 feet east of the AFF (Figure 2-2). The system would include piping and appurtenances to enable the storage tank to be filled by tanker trucks, secondary containment structures, a piping distribution network, and hose reels on the pier for vessel fueling. The tank would be double-walled and placed on a concrete pad. The pad would have curbing to contain spills, and the fueling facility would be surrounded by security fencing.

A fuel truck parking area would be constructed adjacent to the DFM storage tank on the east side and would be 110 feet by 24 feet in size. This parking area would be impervious surface and equipped with an oil/water separator to treat stormwater runoff.

Site Improvements

Some minor demolition would be required to remove unnecessary pavement near the CPO mess, and some utilities would be replaced. Several signs would also be relocated. Site grading

would be limited. Areas of potential construction would essentially maintain the existing grade with some slight grading to create slopes to promote stormwater drainage.

Site improvements include sewer and water utility connections/installation, stormwater collection facilities, electrical power, lighting, fire protection systems, alarms, pedestrian walkways, roadways, signage, and landscaping. Just to the north of the access road (Ediz Hook Road) from the TPS pier would be the approximate location of a buried 13,000-gallon sanitary sewer vault (to temporarily hold sewage from the pier), water vault and electrical service equipment vault, and a dumpster. To the west of the pier near the parking area would be a stormwater detention/infiltration pond (drainage basin).

A portable standby generator would be provided at the pier in the event of an electrical power outage. This generator would provide electrical power to operate the sewage pumps, leak detection systems, gate controls, security equipment, lighting, and the DFM storage tank.

Road surfaces would be paved with pervious asphalt where possible (for example at the RSA and the parking area for the AFF). Other road surfaces would use impervious asphalt or concrete. Pedestrian walkways (from the RSA and AFF to the pier) would be paved with porous concrete or asphalt and be approximately 5 feet in width. Pervious concrete would not be used in the fueling area.

There would be approximately 10,700 ft^2 of new impervious surface created (paving for the parking areas and road improvements and the roof of the AFF facility) and approximately 5,200 ft^2 of existing impervious surface removed by implementing Alternative 1. The net increase in impervious surface is approximately 5,500 ft^2 or 0.13 acre.

Landscaping would consist of a vegetated strip between the road and pedestrian walkway that connects the AFF to the pier and around the AFF. Areas disturbed by construction would be restored. No irrigation system is proposed.

Excavation would be necessary for installing the underground sewage storage tank and underground utilities. Imported structural fill would be required and used to backfill utility trenches and the sewage storage tank excavation.

2.4.2 Alternative 2: Western Site

2.4.2.1 Transit Protection System Pier

Alternative 2 would be located at the western end of USCG AIRSTA/SFO Port Angeles near the entrance gate and on the existing rock riprap jetty (Figure 2-1 and Figure 2-4). The jetty would require refurbishment to be used as the approach road to the TPS pier. The jetty would be widened and the grade altered to transition the approach road from the trestle to the shore road, requiring the addition of fill. Approximately 60 metal sheet piles would be installed around the perimeter of the jetty (between the jetty and the rock seawall) to retain the fill material. The finished road would slope back from the trestle at a 3.3 percent grade. Utility lines including potable and fire flow water, sewer, fuel, phone lines, and electrical would be placed underground. The approach road would be paved with asphalt or concrete and lined with concrete vehicle barriers on both sides for safety.

The TPS pier would consist of a floating pontoon with a fixed trestle and movable transfer span with two floating docks for small boats, each sized 164 feet by 12 feet (Figure 2-5). The trestle would be approximately 55 feet long and 24 feet wide and constructed of precast concrete. It would connect the jetty and provide the anchoring point for the transfer span. The end of the jetty is currently protected with a timber bulkhead capped by a concrete slab. To install the

trestle, the existing timber bulkhead and concrete slab would be removed, the end of the jetty would be re-graded, and sheet piles would be installed to protect the slope.

The trestle would be supported by three in-water 24-inch diameter steel pipe piles with precast concrete caps driven to a depth of 75 to 85 feet and three 24-inch steel pipe piles on land. The trestle would be designed to support a 50-psf live load or a utility trailer with a total load of 3,000 lbs. Concrete vehicle barriers would extend from the jetty onto both sides of the trestle. A security gate with fencing and an automated vehicle gate and personnel turnstile would be erected across the trestle for access control. The security fencing would be approximately 7 feet high and topped with barbed wire. Barbed wire would also be placed around the sides and bottom of the gate, which would extend out past the sides of the trestle.

The transfer span would connect the trestle to the floating pontoon and would move vertically and horizontally with the tide (Figure 2-5). The transfer span would be approximately 120 feet long and 26 feet wide. The trestle and transfer span would be constructed roughly between -2

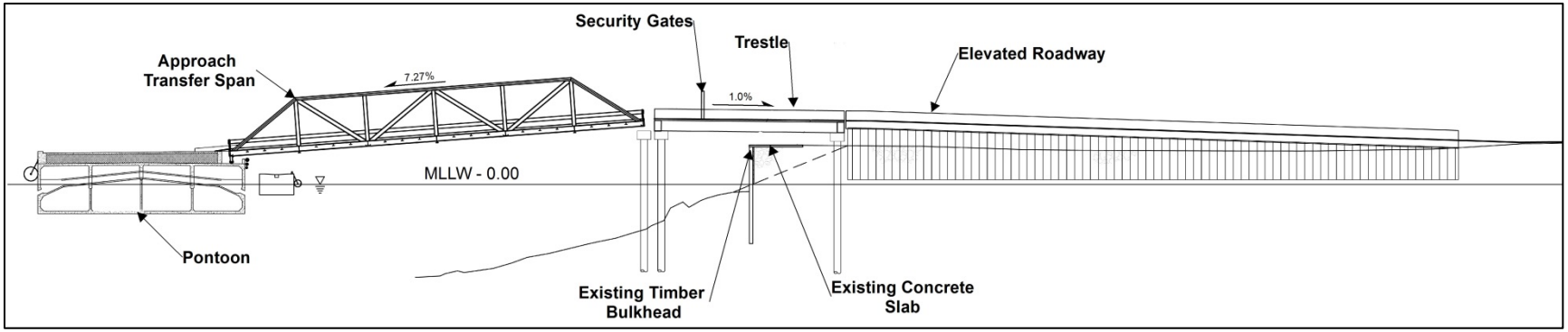

Figure 2-5. Alternative 2 – Trestle, Transfer Span, and Floating Pontoon

feet MLLW and -65 feet MLLW. The transfer span would consist of steel trusses and a concrete and steel deck on steel beam deck framing supported by a concrete cap and three 24-inch steel pipe piles on the shore end. The trestle and transfer span would provide vehicle and pedestrian access to the floating pontoon and carry utilities to service six berths.

The floating pontoon would be a new or refurbished pontoon. If a new pontoon is purchased, it would be approximately 360 feet by 50 feet and be anchored by eight 66-inch steel piles, four on each end driven to a depth of 140 feet. The pontoon would be placed approximately between -40 feet and -60 feet MLLW.

Similar to Alternative 1, the pier would have full hotel services at each of the six berths including power, potable water, fire protection, sewage connections, ship overboard drainage collection, fueling connections, telephone, and internet service. The pier would also be equipped with lighting, intrusion detection, mooring, fendering, brows (gangways), corrosion protection systems, and stormwater protection systems.

The trestle, transfer span, floating pontoon, and floating docks for small boats would result in a permanent increase in overwater coverage of approximately 29,976 ft^2 or 0.69 acre. The depth at the end of the existing jetty is -5 feet MLLW. Permanent new nearshore overwater coverage (shallower that -30 feet MLLW) would be 1,780 ft^2. There would be 17 permanent piles (excluding the sheet piles), 14 of which would be in-water, that would displace approximately 209 ft^2 or 0.0048 acre of the seafloor. The piles would be installed using vibratory and impact pile driving methods. Unlike Alternative 1, piles for the pontoon would not have to be proofed.

In-water construction would require work through one in-water work window beginning in October 2016. The duration of the in-water work (pile driving) within the work window would be approximately five weeks. Pile driving would occur for approximately 15 days, and approximately three piles would be driven in any one day. There would be approximately 3,000 pile strikes per day, including 1,600 proofing strikes. It is possible that with atypical, highly resistant substrate as many as 7,000 impact strikes could be required in a day, but this would be an unlikely outlier condition. Overwater construction would be completed in approximately 30 weeks. The total construction period would be 12 months.

Under this alternative, the pier would be constructed over an existing rock pile, which was created from excess riprap material used in armoring Ediz Hook. The rock pile is used by the scuba diving community.

2.4.2.2 Alert Forces Facility, Ready Service Armory, Fuel Storage and Distribution System, and Site Improvements

The AFF, RSA, DFM and site improvements would be similar as described under Alternative 1. The AFF and RSA would be identical in size and configuration and be situated in the same locations as in Alternative 1 (Figure 2-4). The DFM would be similar in size and configuration to Alternative 1, but located near the end of the pier. The same utility improvements would be required, but would not need to be extended as far onto the site.

2.4.3 Alternative 3: Eastern Site

Alternative 3 would be similar to Alternative 2, with the main difference being in the location of the pier and upland support facilities, the pier design, and the addition of a wave attenuation structure (Figures 2-6 and 2-7).

2.4.3.1 Transit Protection System Pier

Under Alternative 3, the TPS pier site would be located approximately 1,800 feet to the east of the existing T-Pier. The TPS pier design would be similar to Alternative 2 (consisting of a trestle, transfer span, and floating pontoon), with the following differences: the transfer span would

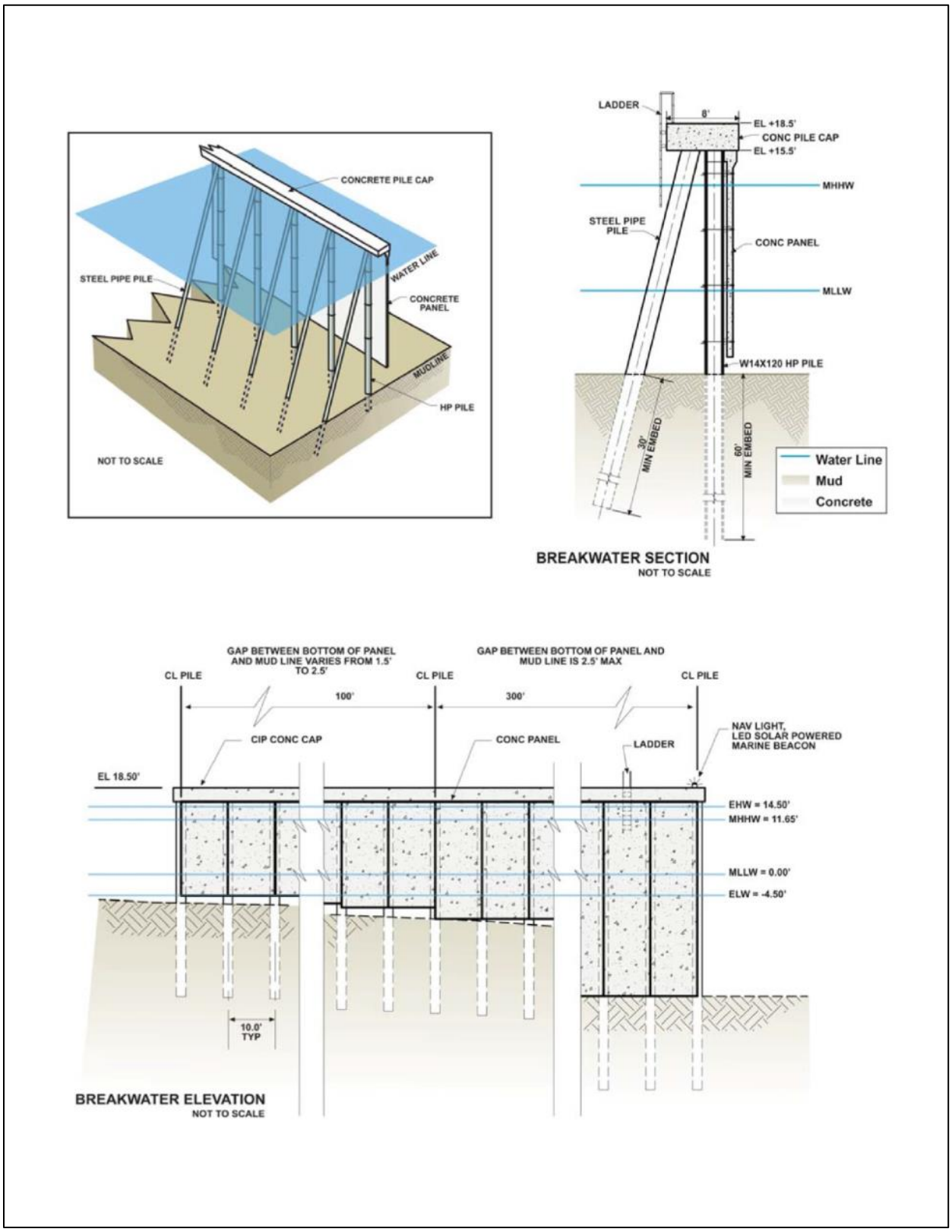

Figure 2-7. Alternative 3 – Breakwater Sections and Elevations

connect to the eastern end of the pontoon to create an L-shaped design, the dimensions of the structures would differ, and the water depths vary.

The trestle would be 120 feet long and 24 feet wide and constructed of precast concrete. It would be supported by six 24-inch steel pipe piles driven to depths of 75 to 85 feet. The transfer span would be identical to the transfer span in Alternative 2. The trestle and transfer span would be constructed in depths ranging from +7 feet to -10 feet MLLW. The floating pontoon would be identical in size to the pontoon in Alternative 2 and placed approximately between -10 feet MLLW and -15 feet MLLW. The wave attenuation structure would be constructed roughly between -10 MLLW and -30 MLLW.

As part of the pier system, a wave attenuation structure (wave screen) would be constructed to provide protection from severe storm events and be installed to the east of the pier system (Figure 2-7). It would be placed between approximately -35 feet MLLW and -86 feet MLLW. The wave screen would be composed of vertical H-piles (a steel H-beam used as a pile) driven into the seafloor. It would be approximately 200 feet long and fixed in place with 20 pairs of piles (40 piles total) topped by precast concrete pile caps and connected by concrete wave panels placed between the piles. The wave panel walls would extend deep enough to absorb waves, but not extend to the seafloor itself (not less than 2.5 feet from the seafloor).

The trestle, transfer span, floating pontoon, and breakwater would result in a permanent increase in total overwater coverage and nearshore (shallower than -30 feet MLLW) overwater coverage of approximately 33,136 ft^2 or 0.8 acre. There would be 17 permanent piles for the trestle, transfer span, and pontoon, which would displace approximately 218 ft^2 or 0.005 acre of the seafloor. Similar to Alternative 1, the piles would be installed using vibratory and impact pile driving methods.

In-water construction would require work through one in-water work window beginning in October 2016. The duration of the in-water work (pile driving) within the work window would be approximately 8 weeks. Pile driving would occur for approximately 25 days, and approximately three piles would be driven in any one day. There would be approximately 3,000 pile strikes per day, including 1,600 proofing strikes. It is possible that with atypical, highly resistant substrate as many as 7,000 impact strikes could be required in a day, but this would be an unlikely outlier condition. Overwater construction would be completed in approximately 33 weeks. The total construction period would be 14 months.

2.4.3.2 Alert Forces Facility, Ready Service Armory, Fuel Storage and Distribution System, and Site Improvements

The upland facilities (AFF, RSA, and DFM storage tank) would be located east of the trestle, near the end of the old taxiway (Figure 2-6). These facilities would be the same size and perform the same functions as described above for Alternative 1. Other site improvements and utilities would be similar to those for Alternative 1, except that utility runs would be longer to reach the existing utility infrastructure at the Alternative 3 site. Eight new parking spaces would be constructed in the upland area.

2.4.3.3 Comparison of Site Features

Table 2-1 provides a comparison of the general site features for each action alternative.

2.4.4 Construction Activities

Under all action alternatives, upland work would require a number of construction vehicles and equipment such as backhoes, dump trucks, cranes, graders, rollers, and excavators. Up to two

pile driving rigs would be used, one in the water and one on the upland area. All material for the AFF, RSA, DFM fueling system, and other landside facilities would be delivered by truck. Small craft floats would likely be delivered by truck.

Table 2-1. Comparison of Main TPS Pier Features

	Alternative 1 Midwestern Site	Alternative 2 Western Site	Alternative 3 Eastern Site
Trestle	355 ft x 24 ft	55 ft x 24 ft	120 ft x 24 ft
Transfer Span (main feature not associated with small boat floats)	N/A	120 ft x 26 ft	120 ft x 26 ft
Floating Pontoon*	N/A	360 ft x 60 ft	360 ft x 60 ft
Fixed Pier	160 ft x 42 ft	N/A	N/A
Wave Attenuation Structure	N/A	N/A	200 ft x 8 ft
Overwater Coverage	25,465 ft^2	29,976 ft^2	33,136 ft^2
Nearshore Overwater Coverage**	8,650 ft^2	1,780 ft^2	33,136 ft^2
Seafloor Displaced by Piles	745 ft^2	209 ft^2	218 ft^2
Number of Permanent In-Water Piles	144	14	57***
Number of Total Permanent Piles (sheet and pipe)	204	17	57
Pile Driving Days	75	15	25
Construction Timing	Two in-water work periods	One in-water work period	One in-water work period

**Assumes use of a refurbished pontoon – if a new pontoon is acquired it would be approximately 360 feet long and 50 feet wide.*

***The nearshore area encompasses the shoreline out to approximately -30 feet MLLW.*

****Includes H piles for the wave attenuation system.*

All piles and the transfer span (if needed) would be fabricated off site. These would be trucked to a staging yard where they would be loaded on a supply barge along with other equipment needed (e.g., impact and vibratory hammers) for in-water work. A separate crane barge along with the supply barge would be towed to the project site. Concrete for the pile plugs, pile caps, and trestle topping slab and the pre-cast beams for the trestle would be delivered by truck. If a salvaged pontoon is used, it would be towed to a suitable refit facility and all refurbishments would occur there. The pontoon would then be towed to Port Angeles.

The in-water work includes driving piles. It would be necessary to drive 24-inch indicator piles to assess whether the required bearing capacities would be achieved and to assess whether the correct vibratory and impact hammers are being used. The preferred method would be to vibrate the indicator piles to within 5 feet of the embedment depth required, let the piles rest in place for a day, and then vibrate the piles the final 5 feet. If the indicator piles cannot be successfully vibrated in, then a larger hammer would be used for the production piles. The impact driving would also provide an indication of bearing capacity via proofing. Each indicator pile is anticipated to take up to 30 minutes to vibrate in place; indicator piles would be installed in a day. Proofing would take up to a maximum of 400 strikes per pile. Proofing would occur on successive days; each indicator pile would then be extracted by vibration.

If difficult subsurface driving conditions (e.g., cobble/boulder zones) are encountered that cause "refusal" with vibratory equipment, it may be necessary to use an impact hammer to drive some piles for the remaining portion of their required depth. The worst-case scenario is that a pile would be driven for its entire length using an impact hammer. Given the uncertainty in the types and quantities of erratics (large boulders) that could be encountered, and the depth at which they may be encountered, the number of strikes necessary to drive a pile its entire length could range from 1,000 to 2,000 strikes per pile, and for multiple piles it is possible that as many as 7,000 impact strikes could be required in a day in this worst-case scenario. Finally, it may be necessary to drive several temporary piles during the installation of the transfer span when it is set in place on the pontoon. These piles would be in place for approximately 1 to 2 weeks.

2.4.5 No Action Alternative

Under the No Action Alternative, the Navy would not construct a TPS pier and upland facilities at USCG AIRSTA/SFO Port Angeles. The TPS vessels would continue to be berthed on a space available basis at PoPA facilities. Crew members would continue without a dedicated facility for overnight accommodations and mission planning, and TPS crew and maintenance technicians would continue to drive or be transported by road between the PoPA and USCG AIRSTA/SFO Port Angeles. Compliance with underway hour limits, policies, and regulations would continue to be challenged by weather and logistic conditions. The Navy has determined that the No Action Alternative would not comply with the Navy's security and TPS mission requirements and would therefore not meet the purpose and need. This EA analyzes the environmental effects of the No Action Alternative in accordance with OPNAVINST 5090.1D and CEQ regulations set forth in 40 CFR 1502.14(d).

2.5 Design Measures, Current Practices, Best Management Practices (BMPs), and Conservation and Minimization Measures

Design features and measures have been built into the project to avoid environmental impacts. Where avoidance is not possible, the design has been modified to minimize impacts. Implementation of the action alternatives would include incorporation of the following design measures, current practices, construction BMPs, and conservation and minimization measures to avoid or minimize potential environmental impacts. In addition, compensatory mitigation and mitigation for impacts to treaty reserved rights and resources would be implemented (Please refer to Section 2.6 and Appendix A).

2.5.1 Design Measures

- The trestle, transfer span, fixed pier, and floating pontoon elements of the project would be designed to minimize the amount of disturbance to the seabed and amount of overwater shading as much as practical.
- The pontoon (Alternatives 2 and 3) and end of the fixed pier (Alternative 1) would be located in depths greater than -30 feet MLLW to minimize potential impacts on eelgrass beds.
- The pier would be sloped to capture stormwater, which would then be filtered for basic treatment prior to discharge into the harbor per a National Pollution Discharge Elimination System (NPDES) permit.
- Pervious pavement over crushed stone infiltration beds would be implemented as much as possible to reduce stormwater runoff and allow natural infiltration to take place. This includes new parking areas and pedestrian walkways.

- Stormwater runoff from the upland areas including the roof of the AFF would be routed to the ground and infiltrated.
- The AFF would be designed to Leadership in Energy and Environmental Design (LEED) Silver standards, which require that the building be constructed in an environmentally responsible way for sustainability. This includes the use of recycled material and facilities that save water and energy, management of stormwater runoff, and measures to manage waste.

2.5.2 Current Practices

- In-water construction would observe the Tidal Reference Area 10 in-water work window (July 16 through February 15).
- Bubble curtains would be used to minimize noise impacts on marine life from impact pile driving.
- To reduce the likelihood of petroleum products, chemicals, or other toxic or deleterious materials from entering the water, fuel hoses, and oil or fuel transfer valves and fittings would be checked regularly for drips or leaks, and would be maintained and stored properly to prevent spills.
- In the event of a spill, the USCG would implement response measures in accordance with the existing Contingency Plan.
- A Hazardous Materials Management Plan would be developed and implemented to provide guidance for the handling, and storage of hazardous materials, and disposal of hazardous waste.
- A Debris Management Plan would be developed and implemented, along with the existing Contingency Plan, to retrieve and clean up accidental spill and construction debris. Personnel would be trained in hazardous material handling and spill response, and would be equipped with all necessary response tools, including absorbent oil booms. In the event of a spill, cleanup and containment efforts would begin immediately and take precedence over normal work.
- Anti-Terrorism and Force Protection Requirements:
    - In accordance with DoD Minimum Antiterrorism Standards for Buildings (United Facilities Criteria (UFC) 4-010-01, 1 October 2013), all DoD Components must adopt and adhere to common criteria and minimum construction standards to reduce the potential damage that could be inflicted by terrorist activity directed at DoD buildings. The Proposed Action is located within USCG AIRSTA/SFO Port Angeles, which prohibits access for all non-authorized personnel and vehicles. The design of each alternative is in compliance with AT/FP requirements and incorporates current AT/FP standards, where appropriate, to reduce the potential damage that could be inflicted by terrorist activities. AT/FP standards consist of site planning, including standoff distances, unobstructed space, drive-up and drop-off areas, access roads, and parking; structural design; and electrical and mechanical design.
    - AT/FP design measures incorporated into the AFF and RSA include required standoff distances, lighting and gated security fencing to provide obstruction free areas surrounding the facilities, and parking limitations. Proposed materials and coatings for windows, doors, and walls would meet applicable AT/FP standards.

- **o** The Proposed Pier has also been designed to meet AT/FP requirements. Entry from the land side of the pier would be controlled with a security gate and fencing, and a vehicle gate and personnel turnstile would be erected across the pier for access control. Section 2.7 discusses Naval Vessel Protective Zones and security restrictions that would be in place while vessels are moored at the proposed pier.

2.5.3 Construction BMPs

- Stormwater discharges would meet the requirements of the Construction Stormwater General Permit.
- A Temporary Erosion and Sediment Control Plan, Environmental Protection Plan, and Stormwater Pollution Prevention Plan would be developed and approved prior to construction.
- Measures would be implemented to avoid anchor dragging and line dragging during construction.
- Construction vessels would be excluded from shallow areas (less than 30 feet in depth) outside the immediate construction site (within 150 feet of the trestle or pier).
- Within the immediate construction site:
    - Vessel operators would be instructed to avoid using excess engine thrust in waters less than 30 feet.
    - Vessel operators would be instructed to avoid bottoming out (running aground) in shallow areas.
    - Barges would not be anchored over vegetated shallows for more than 96 hours (4 days).
- As much as practical, construction equipment would be kept out of the water to minimize and prevent contaminant releases.
- As much as practical, a vibratory hammer would be used for the pile driving actions; however, it would be necessary to use an impact hammer to proof the piles.
- A Sediment Management Plan would be developed and implemented to control the spread of silt from pile driving and removing the bulkhead under Alternative 2.
- During in-water and overwater work, containment booms and absorbent booms (or other oil-absorbent fabric) would be placed around the perimeter of the work area to capture wood debris, oil, and other materials if released into marine waters. All accumulated debris would be collected and disposed of at an approved upland site. Following the completion of in-water construction activities, an underwater survey would be conducted to remove lost construction materials.
- Noise-generating construction activities would be restricted to the period between 7:00 a.m. and 10:00 p.m.
- If required, a Water Quality Monitoring Plan would be developed and implemented to ensure compliance with the project's water quality certification. Testing for specific water quality parameters would be completed to ensure that construction activities are in compliance with Washington State Surface Water Quality Standards (173-201A Washington Administrative Code [WAC]).

- A Stormwater Pollution Prevention Plan (SWPPP) would be implemented for construction and operation and include measures for avoiding or minimizing erosion and sedimentation.
- All chemicals, liquid products, petroleum products, and wastes present at the construction site would be covered and contained.
- Soil areas disturbed by grading would be restored.

2.5.4 Conservation and Minimization Measures

- The construction contractor would coordinate with the City of Port Angeles to prepare a traffic control plan for Ediz Hook Road.
- During impact and vibratory pile driving, visual monitoring would be conducted for marine mammals. Pile driving operations would cease if a California sea lion, Steller sea lion, elephant seal, or harbor seal approaches a 100 m shut-down zone during impact driving. For harbor porpoises, impact pile driving operations would cease if they approach a 150 m shut-down zone. For all other marine mammals, including ESA-listed humpback and southern resident killer whales, pile driving operations would cease if these species are observed approaching the behavioral zone (see Appendix E).
- During impact pile driving, hydroacoustic monitoring would be conducted on a subset of driven piles to to verify actual noise levels against modeled noise levels.
- The Navy would comply with the requirements of the USFWS Biological Opinion in order to minimize impacts resulting from noise to marbled murrelets.
- Impact pile driving would occur between 2 hours after sunrise and 2 hours before sunset to protect foraging marbled murrelets during the breeding season of April 1 to September 23.
- The Puget Sound Pilots Station and general public would be notified in advance of upcoming construction activities and noise at the beginning of each in-water construction season.
- An Inadvertent Discovery Plan would be prepared and approved.

2.6 Compensatory Mitigation and Mitigation for Impacts on Treaty Reserved Rights and Resources

The Navy proposes to implement mitigation in accordance with Appendix A, the Mitigation Action Plan (Plan). The Plan describes compensatory mitigation for the loss of aquatic resources pursuant to the U.S. Army Corps of Engineers (USACE)/U.S. Environmental Protection Agency (EPA) Final Rule on Loss of Aquatic Resources (USACE and EPA 2008) and mitigation for impacts on Treaty reserved rights and resources. The Navy is coordinating with the USACE, DNR, affected tribes, and the City of Port Angeles to develop mitigation to compensate for the loss of aquatic resources and impacts on treaty reserved rights and resources.

2.6.1 Compensatory Mitigation (Inner Ediz Hook Jetty Restoration)

The Navy is proposing to restore nearshore habitat by removing a rock jetty that is located approximately 1,600 feet west of the Midwestern Site, Alternative 1. This mitigation, known as the Inner Ediz Hook Jetty Restoration project, would involve the removal of 7,650 cubic yards of fill located in tidelands off the south shore of inner Ediz Hook east of the USCG AIRSTA/SFO Port Angeles entrance gate (Figure 2-8). The fill extends approximately 215 feet south from the

shoreline and is protected by a rock and timber bulkhead capped by a concrete slab. The timber piles comprising the bulkhead would be removed by vibratory extraction. The shoreline at the jetty site would be augmented with sand and gravel suitable for beach nourishment and contoured to be consistent with the surrounding shoreline. Large wood would be incorporated into the reconstructed beach. A new, rock-armored embankment section would be tied into the existing embankment armoring by reusing removed material as much as possible. However, creosote-treated timber would not be reused. Revegetation of back beach areas would be accomplished by planting native dune grass species or other native vegetation.

The jetty, which is no longer used, was built in 1975 to offload basalt blocks for armoring the northern Ediz Hook shoreline. DNR granted the USCG a deed to the aquatic tidelands containing the Ediz Hook Jetty in accordance with Session Laws of 1927, Chapter 255. The site is comprised of rock riprap, a timber bulkhead capped by a concrete slab, and other fill. The surrounding substrate is similar to the project site in that it is highly varied and contains a mix of sand, silt, shells, gravel, and wood debris (Berger Abam 2014). Marine vegetation (eelgrass, kelp, and algae) is present adjacent to the mitigation site. Eelgrass was documented on the east and west side of the jetty for a combined total of 49,693 ft^2 occurring in discontinuous patches between -0.5 and -20 feet MLLW (SEE LLC 2015), though it would appear that the jetty itself may be an impediment to eelgrass growth (see Figure 2-9).

Following the completion of the Ediz Hook Jetty Restoration project, up to 24,600 ft^2 of aquatic nearshore habitat, free of barriers and shading, would be created. Figure 2-10 shows pre- and targeted post-mitigation bathymetric contours at the jetty site. The proposed post-mitigation contours will be designed to match the contours of the adjacent tidelands. Eelgrass in the adjacent tidelands on the east side of the jetty occurs predominantly between -1 and -20 feet MLLW, but occurs as shallow as -0.5 foot MLLW and as deep as -30 feet MLLW. Over time, as natural processes take over, eelgrass could populate the re-contoured habitat to restore a continuous band of vegetation across the former jetty site. With the removal of the jetty, the existing nearshore barrier the jetty creates would be gone, no longer imposing a barrier forcing migrating juvenile salmonids to deeper waters with greater exposure to predation.

2.6.2 Treaty Mitigation

2.6.2.1 Icicle Seafoods Laydown Area Restoration

In accordance with a Memorandum of Agreement between the Navy and the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe this restoration would remove existing rock armoring, imported fill and debris, concrete/asphalt pads, and storage structures. The site would be graded to create a low-slope beach. Clean, suitable-sized gravel/sand beach nourishment and large woody debris would be added and appropriate native vegetation planted in the back beach areas. A nearby derelict building (the former City of Port Angeles "Thunderbird" concession stand) would also be removed. The need for a wave attenuation structure (floating or fixed) to protect the western edge of the city's boat ramp from erosion would be evaluated and, if necessary, would be included in the Treaty mitigation. The proposed Treaty mitigation project also includes enhancement of a small section of upland property west of the Icicle Seafoods laydown area. An approximately 15-foot-wide back beach area (to 15 feet landward from MHHW) would be redeveloped with native vegetation. The intent is to connect the restored Icicle Seafoods laydown area with the existing beach area west of the Icicle Seafoods area, as shown on Figure 2-8. The project would restore intertidal and back beach nearshore habitat, and would be consistent with the Lower Elwha Klallam Tribe's ongoing restoration efforts along the southern shoreline of Ediz Hook. Lower Elwha Klallam Tribe technical staff would participate in the Treaty mitigation project design process to ensure that final designs are consistent with the goals memorialized in the Memorandum of Agreement.

Following the completion of the Icicle Seafoods Laydown Area Restoration, approximately 18,250 ft^2 of intertidal nearshore habitat (below MHHW), free of barriers and shading, would be created, and approximately 7,575 ft^2 of back beach nearshore habitat (above MHHW) would be created.

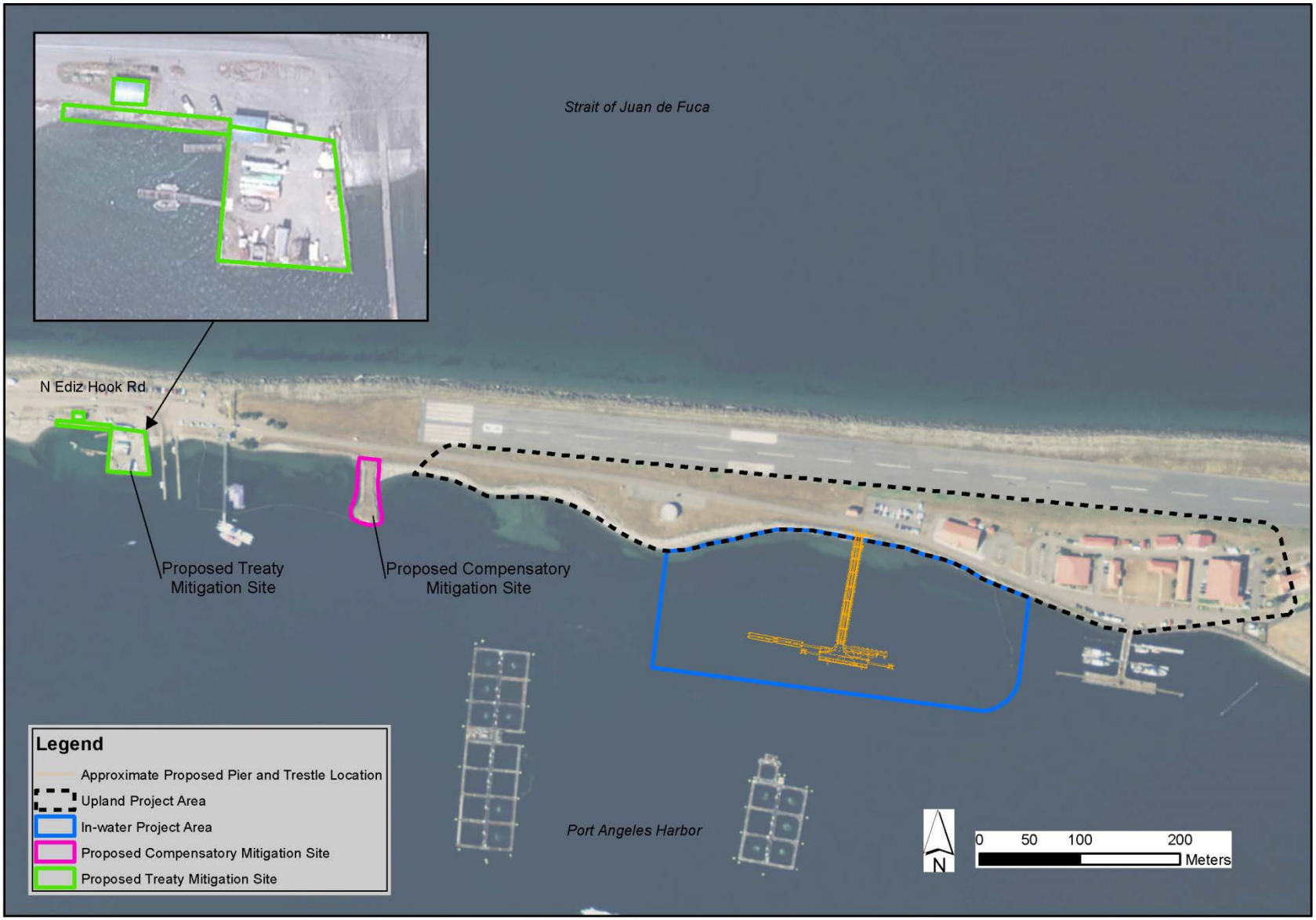

Figure 2-8. Proposed Compensatory and Treaty Mitigation Sites

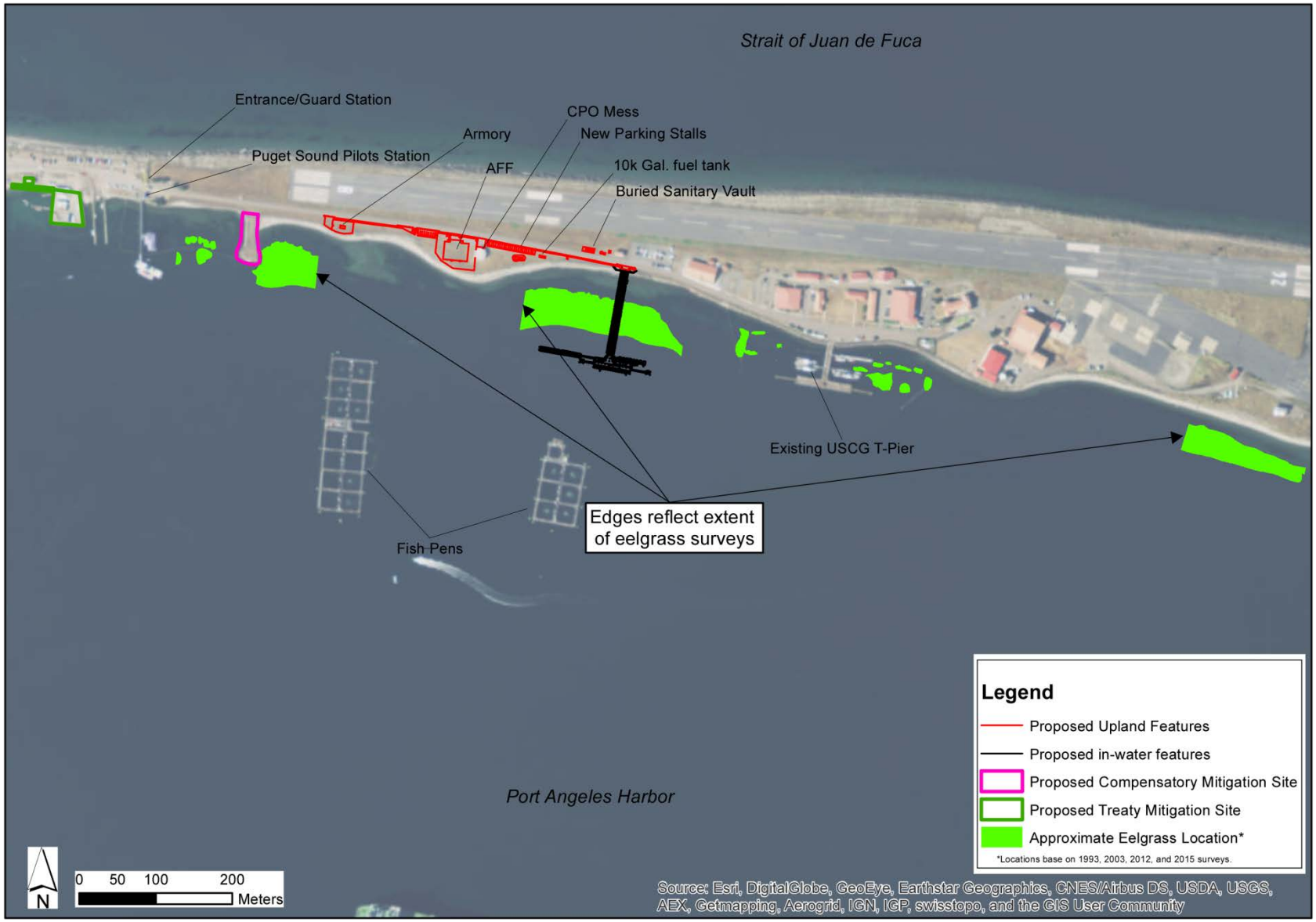

Figure 2-9. Eelgrass Presence Near the Compensatory Mitigation Site

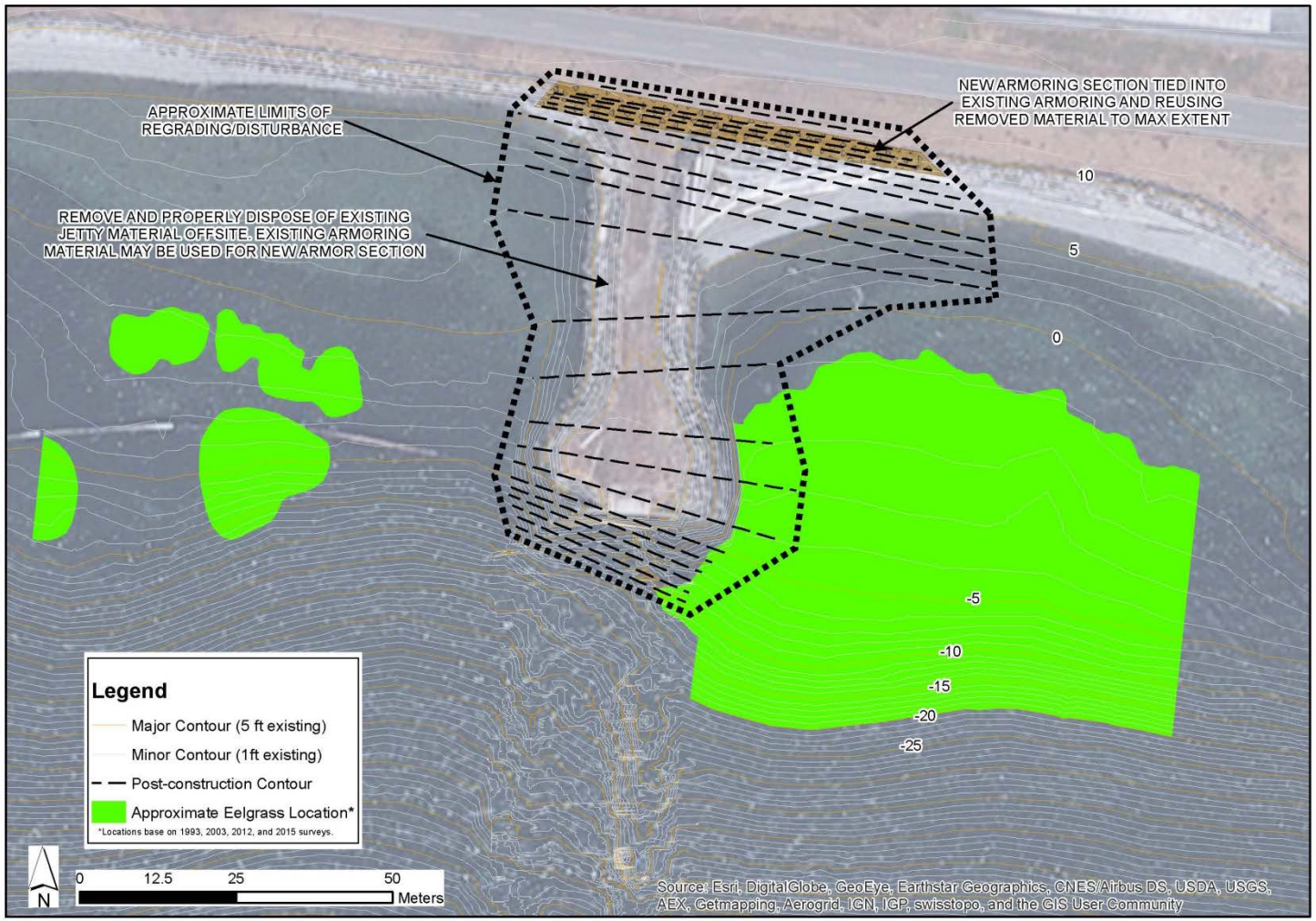

Figure 2-10 Compensatory Mitigation Site Pre- and Post-Mitigation Bathymetric Contours

2.6.2.2 TPS Project Site Eelgrass Salvage

Prior to the initiation of the TPS in-water construction, the Lower Elwha Klallam Tribe and the Navy will examine the feasibility of salvaging eelgrass from the planned TPS pier footprint and transplanting on shallow subtidal restoration sites along Ediz Hook. If the parties agree that the project is feasible, the Navy will enter into a Cooperative Agreement under the Sikes Act with the Lower Elwha Klallam Tribe for the Tribe to perform the work and Navy will provide funding not to exceed $50,000.00 (or actual costs if less) to support this salvaging and transplanting activity. The Cooperative Agreement would stipulate that the work must be completed in a manner that does not delay the start of in-water construction.

2.7 Facility Operations and Maintenance

The term “operation” is used in this EA to describe the activities associated with the long-term use of the TPS pier and upland facilities. These include activities such as maintenance and refueling of moored TPS vessels, maintenance of the pier and upland facilities, on shore and at moorage training, deliveries of fuel and supplies, vehicular movements, storage of small arms and ammunition in the RSA, and use of the AFF. The term “operation” does not include any activities associated with the TPS vessels once they leave their moorage. These activities are addressed in the *Northwest Training and Testing Final Environmental Impact Statement/Overseas Environmental Impact Statement* (NWTT FEIS; Navy 2015).

Maintenance of the pier or pontoon, transfer span, and trestle infrastructure would include routine inspections, repair, and replacement of facility components, as required. All maintenance would incorporate the measures listed in Section 2.5 under Construction BMPs.

The installed piles are designed to not require replacement during the design life of the structure. A protective coating and additional steel thickness would be installed on all piles to ensure that the piles would not need replacement. Periodic inspections of the piles would verify the integrity of the structure. Maintenance would be performed on the protection system to ensure it continues to operate as designed. Maintenance would include, as necessary, repairing damage to the coatings. Other actions would involve repairing the pile coating as it becomes worn.

When the large, 250-foot BVs are moored at the proposed pier, the Navigation Rules associated with a Naval Vessel Protection Zone (NVPZ) would be in effect. The CFR (33 CFR 165.2010 to 165.2030, *Navigation and Navigable Waters),* establishes the geographic parameters for vessel protection zones surrounding Navy vessels in the navigable waters of the U.S. An NVPZ is a 500-yard regulated area of water surrounding large U.S. Navy vessels (greater than 100 feet in length overall) that is necessary to provide for the safety or security of these Navy vessels. An NVPZ exists around all such Navy vessels at all times in the navigable waters of the U.S., whether the Navy vessel is underway, anchored, moored, or within a floating dry dock, except when the Navy vessel is moored or anchored within a restricted area or within a naval defensive sea area.

When another vessel is within an NVPZ, it is required to operate at the minimum speed necessary to maintain a safe course (unless required to maintain speed by the Navigation Rules) and should proceed as directed by the USCG, the senior naval officer present in command, or the official patrol. When within an NVPZ, no vessel or person is allowed within 100 yards of a large Navy vessel unless authorized by the USCG, the senior naval officer present in command, or official patrol. When conditions permit, the USCG, senior naval officer present in command, or the official patrol should permit vessels that must transit via a navigable channel or waterway to pass within 100 yards of a moored or anchored large U.S. Navy vessel with minimal delay consistent with security.

To help ensure the security of the proposed pier, the USCG may establish a security zone around it once constructed that would prohibit unauthorized persons or vessels from entering the zone. The size of the security zone would depend on a number of factors, including which design alternative is selected. The establishment of such a security zone would follow the normal rulemaking process, which generally requires the publication of a notice of proposed rulemaking to allow opportunity for public comment.

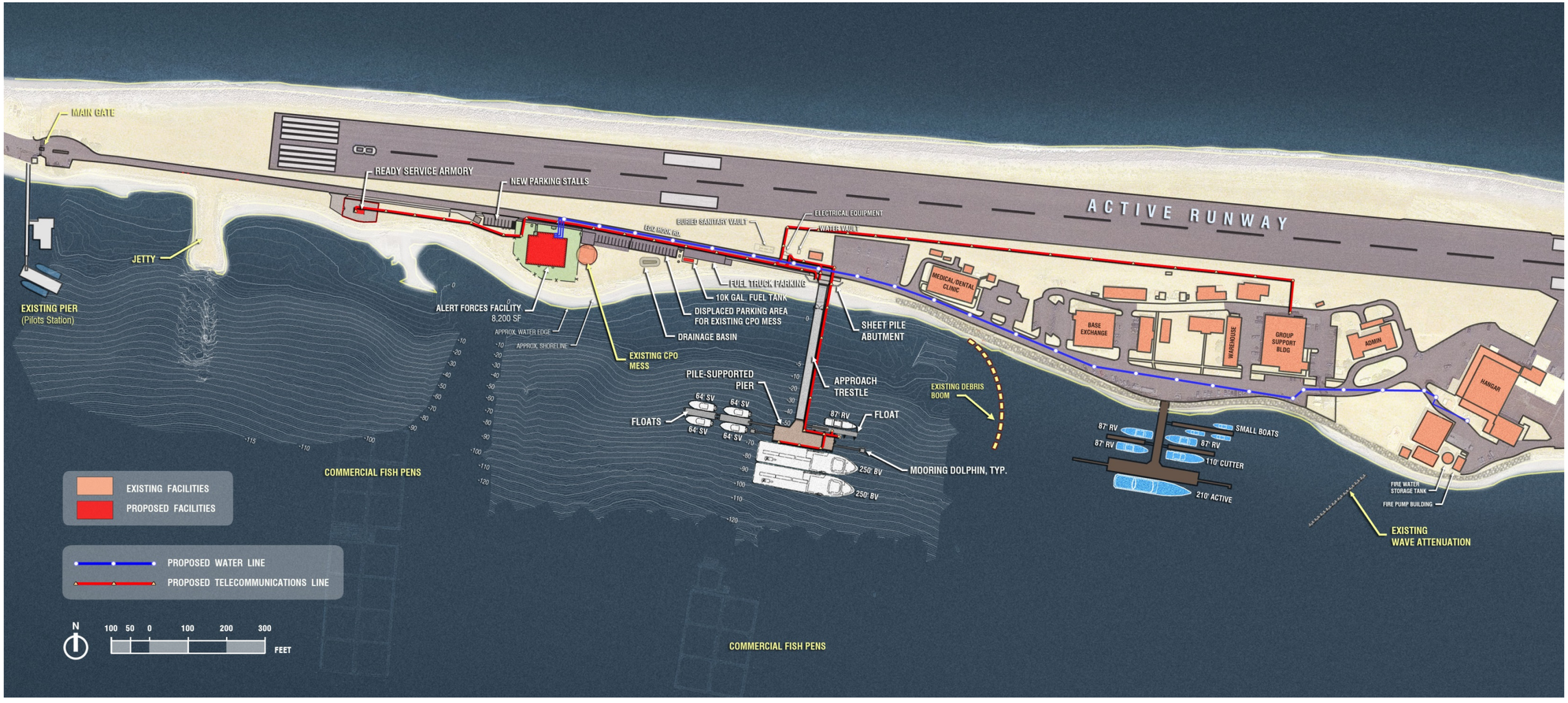

Figure 2-2. Alternative 1 – Midwestern Site

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Figure 2-4. Alternative 2 – Western Site

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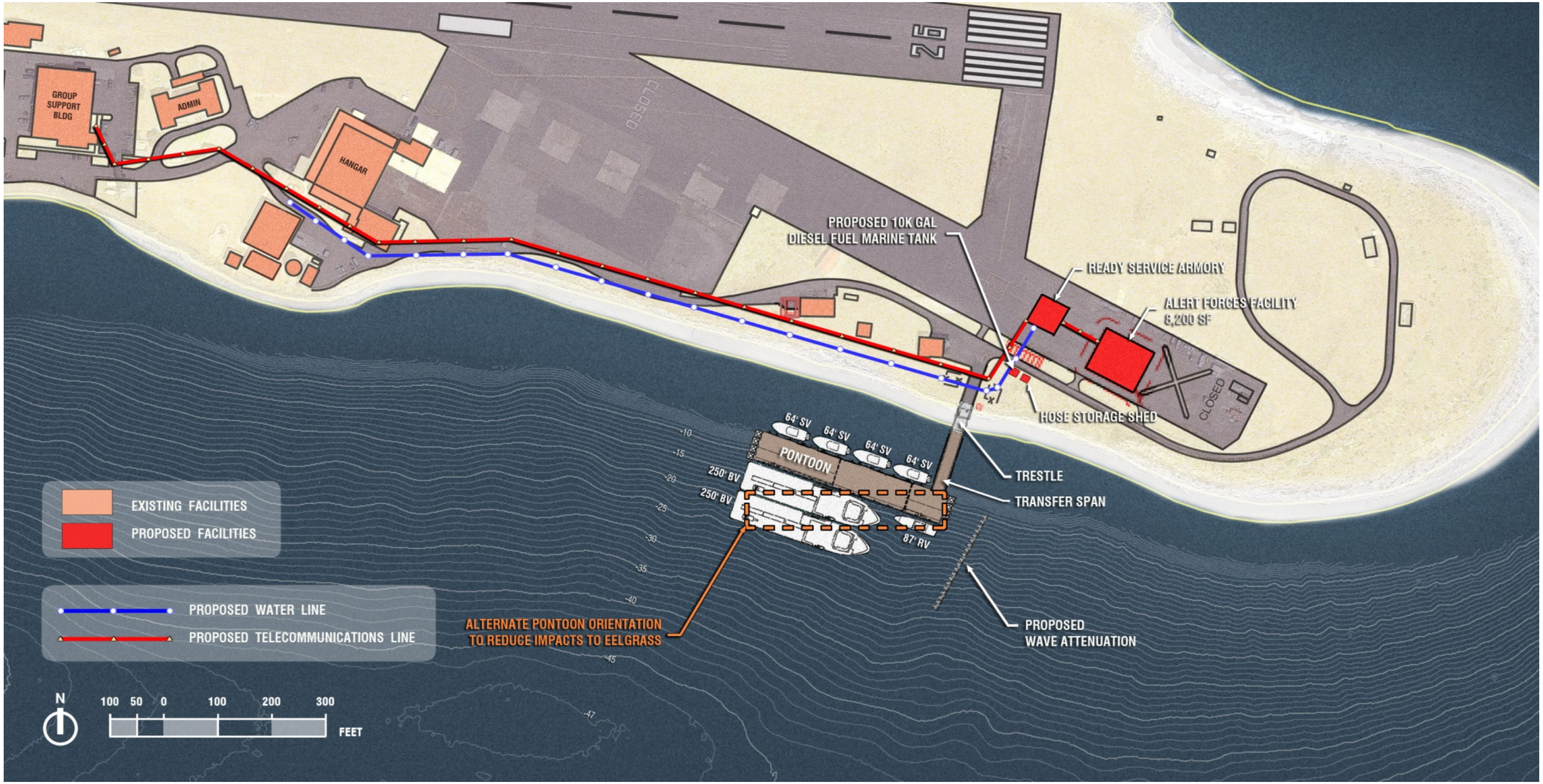

Figure 2-6. Alternative 3 – Eastern Site

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3.0 Affected Environment and Environmental Consequences

This chapter presents the baseline conditions of the affected environment and assesses the potential impacts, or environmental consequences, of implementing the alternatives within the affected environment. In compliance with NEPA, CEQ regulations, and Navy procedures for implementing NEPA, the description of the affected environment and environmental consequences focuses only on those resources potentially subject to impacts. Accordingly, the following resources are evaluated: land use and recreation, water quality and marine sediments, biological resources, cultural resources, American Indian traditional resources, noise, socioeconomics, environmental justice, marine traffic and transportation, shore traffic and circulation, visual resources, solid waste and hazardous materials, public health and safety, and utilities.

The impact analysis is separated into two sections: construction and operations. Construction impacts are short term and temporary in nature and only last for the duration of construction. Operation impacts are longer term and occur during the use of the proposed upland and pier facilities.

The project area for the EA analysis varies by resource, but in general includes the upland areas, nearshore, and offshore waters of Ediz Hook in the vicinity of USCG AIRSTA/SFO Port Angeles. Resource-specific definitions of the project area are presented within the Chapter 3 subsections, as appropriate.

3.1 Land Use and Recreation

This section provides an overview of the regulatory setting for land use and recreation at Ediz Hook; describes jurisdiction, zoning, ownership and land use, as well as existing recreation facilities and opportunities on Ediz Hook; and assesses the impact of construction, operation, and maintenance of the Proposed Action on land use and recreation.

3.1.1 Regulatory Setting

3.1.1.1 Land Use

The Coastal Zone Management Act (CZMA), 16 U.S.C. § 1451–1465, was passed in 1972 with the purpose of balancing the competing priorities of economic growth and environmental protection in the coastal zone. The foundation of the CZMA is that coastal management programs established at the state and local level are the best means to achieve the goals of the CZMA. Under the CZMA, states are afforded the opportunity to conduct “consistency reviews” of federal agency activities with the potential to affect coastal uses and resources. Regulations governing federal consistency are at 15 CFR 930. While a state’s coastal zone does not include federal lands, a federal agency action that is reasonably likely to affect any land or water use or natural recourse of the coastal zone must be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the federally approved Coastal Management Program of the state. A federal agency’s consistency obligations are independent of those required under NEPA.

Washington’s coastal zone comprises the state’s 15 coastal counties that front saltwater (excluding federal lands). Under Washington’s program, which is administered by Ecology, federal activities that affect the coastal zone must comply with the enforceable policies of:

- the Shoreline Management Act
- the State Environmental Policy Act (SEPA)

- the Clean Water Act (CWA)
- the Clean Air Act
- the Energy Facility Site Evaluation Council
- the Ocean Resource Management Act

For activities undertaken by a federal agency, the federal agency reviews the activity for consistency with the six laws and prepares a "federal consistency determination" that describes the activity and whether the activity impacts coastal resources. If the activity impacts coastal resources, a statement must be provided that the activity is consistent to the maximum extent practicable with the enforceable policies in the six laws. An enforceable policy is a state policy that is legally binding under state law and incorporated in the state's coastal management program as approved by the National Oceanic and Atmospheric Administration pursuant to CZMA Section 306.

The federal government is not subject to local or state land use or zoning regulations under the doctrine of federal supremacy, unless specifically consented to by Congress. However, the federal government takes state and local land use plans, guidelines, and ordinances into consideration and cooperates with agencies to avoid conflicts when practicable. The Navy and USCG incorporate sustainable planning practices into facility planning, construction, and operations as required under various environmental laws and executive orders (e.g., Naval Facilities Instruction 11010.45 [Navy 2003]). These address general principles and guidance for sustaining compatible conditions through coordination with neighboring communities. While USCG AIRSTA/SFO Port Angeles is exempt from local planning, the USCG works closely with the City of Port Angeles to accommodate city planning goals.

The City of Port Angeles has several planning documents that include Ediz Hook and USCG AIRSTA/SFO Port Angeles; these include the Comprehensive Plan (City of Port Angeles 2010), Zoning Code (2015), Shoreline Master Program (SMP) (City of Port Angeles 2014a), and Harbor Resources Management Plan (HRMP) (City of Port Angeles 2011a). The Comprehensive Plan designates Ediz Hook and USCG AIRSTA/SFO Port Angeles as Open Space, except for the area around the Puget Sound Pilots Station and Icicle Seafoods staging area, which are designated Commercial.

USCG AIRSTA/SFO Port Angeles is zoned Public Buildings and Parks and so is the rest of Ediz Hook, except for two areas on the south side of the hook that are designated as Commercial Office; these include the Puget Sound Pilots Station and the Icicle Seafoods staging area. The majority of the harbor including the area adjacent to USCG AIRSTA/SFO Port Angeles is zoned as Industrial. The SMP designates the shorelines at USCG AIRSTA/SFO Port Angeles as High-Intensity Marine and the rest of Ediz Hook west of USCG AIRSTA/SFO Port Angeles as Urban Conservancy – Recreation. Land uses in the project area are shown on Figure 3.1-1.

3.1.1.2 Recreation

Access to USCG AIRSTA/SFO Port Angeles is restricted, and public recreation is not allowed. Four documents—the SMP (City of Port Angeles 2014a), Comprehensive Plan for the City of Port Angeles (City of Port Angeles 2010), City of Port Angeles Parks and Recreation Master Plan (City of Port Angeles 2011b), and the HRMP (City of Port Angeles 2011a)—provide guidance for recreational uses on Ediz Hook.

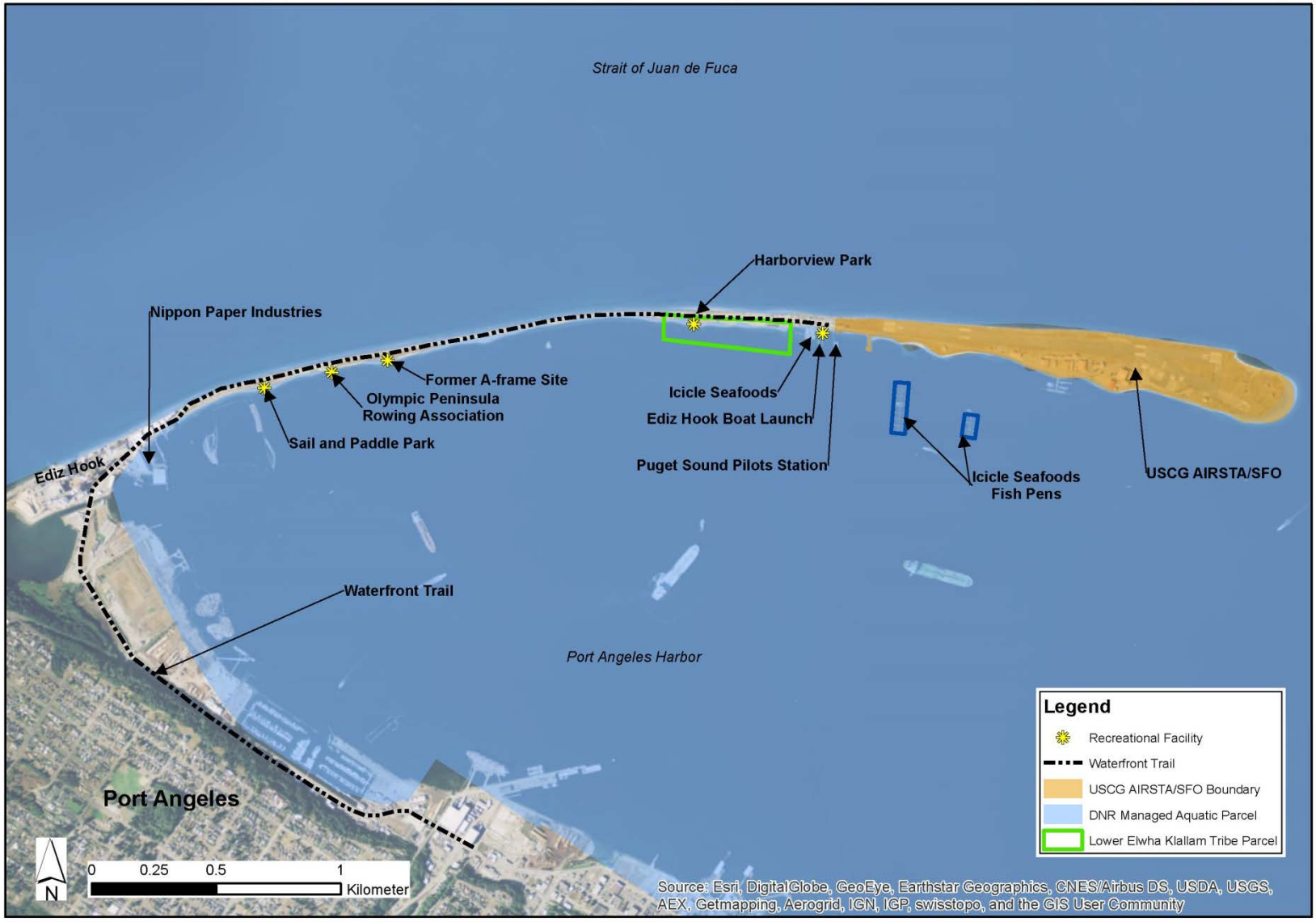

Figure 3.1-1. Land Uses in the Project Area

Ecology approved the City of Port Angeles' SMP comprehensive update; in accordance with the Revised Code of Washington (RCW) 90.58.090, the effective date of Port Angeles' shoreline program was November 17, 2014. The comprehensive update revises the existing shoreline program, including the goals, policies, regulations, shoreline environment designations, and administrative procedures and definitions. The updated program will work in tandem with other city plans for redevelopment, public access, and restoration in shoreline areas. It also promotes the conservation of native vegetation, provides stronger protection for wetlands in shoreline jurisdiction, and requires an assessment of legitimate need for new and replacement shoreline armoring while recognizing the city's historic land use pattern.

Goal A of the Comprehensive Plan for the City of Port Angeles contains an objective to develop an Ediz Hook Master Plan that designates land uses, improves public access to shorelines, abates deteriorating structures, and allows for expanded recreational and commercial uses. Recommendations for Ediz Hook in the Parks and Recreation Master Plan include replacing aging restrooms, replacing the west boat dock, and developing a Port Angeles Marine Park approximately two miles east of USCG AIRSTA/SFO Port Angeles. The HRMP recommendations for Ediz Hook include providing interpretive displays at the former A-frame site, improving access for scuba diving, constructing a dive park, improvements at the Waterfront Trail, and organizing and focusing car parking at certain locations.

3.1.2 Affected Environment

3.1.2.1 Land Use

USCG AIRSTA/SFO Port Angeles is the nation's oldest operating air-sea rescue station. It lies on the seaward (eastern) end of Ediz Hook and is responsible for SAR, law enforcement, homeland security, and resource protection for the area that includes the Strait of Juan de Fuca and the northwestern coast of Washington around the Olympic Peninsula to the mouth of Puget Sound. Approximately 250 to 300 men and women are based at the station, including helicopter rescue crews. USCG AIRSTA/SFO Port Angeles has a 24-hour operations center, military exchange, medical clinic, administrative building, and temporary quarters for personnel during their 24-hour shifts. There is also a 4,000-foot long runway and helipad for USCG use.

Adjacent land uses to the west of USCG AIRSTA/SFO Port Angeles on Ediz Hook include the Puget Sound Pilots Station, Ediz Hook Boat Launch, Harborview Park, Icicle Seafoods office and staging area, Sail and Paddle Park, Olympic Peninsula Rowers Association shell house, and the Waterfront Trail (Figure 3.1-1).

USCG AIRSTA/SFO Port Angeles and most of Ediz Hook are federally owned, except for Harborview Park, which is owned by the Lower Elwha Klallam Tribe. The USCG owns the tidelands out to -24 feet MLLW from the base. DNR manages the remaining State-owned aquatic lands (marine, tidal, and seabed land) in the harbor, and PoPA manages the harbor. The City of Port Angeles has a long-term lease from the federal government for Ediz Hook, except for the base and Harborview Park (City of Port Angeles 2011a). The city owns and operates the Ediz Hook Boat Launch (located just west of the entrance gate to USCG AIRSTA/SFO Port Angeles) and Sail and Paddle Park (located farther west near the base of Ediz Hook). The city rents out a boathouse at Sail and Paddle Park to the Olympic Peninsula Rowing Association. Upland facilities for the boat launch are located on land the city leases from the federal government, while facilities waterward of the shoreline, such as the docks, are located on aquatic lands the city leases from DNR. Icicle Seafoods leases upland areas from the City of Port Angeles. Its offices are predominantly located on land owned by the Bureau of Land Management, which is leased to the City of Port Angeles. Most of the Icicle Seafoods

upland laydown area is located on tidelands and filled tidelands owned by DNR. Icicle Seafoods has submitted a lease application (No. 20-087303) for use of this land. However, Aquatic Lands Net Pen Lease (22-B02777) executed between Icicle Seafoods and DNR on October 1, 2015 identifies that Lease No. 20-087303 remains pending and that "the tenant acknowledges that it has no right to use, possess, or occupy Ediz Hook tidelands." Icicle Seafoods leases aquatic bedlands offshore from USCG AIRSTA/SFO Port Angeles from DNR for the operation of their floating fish pens. The Puget Sound Pilots lease land from the City of Port Angeles for their onshore facilities, and aquatic lands (tidelands and bedlands) for their pier, piling, floats, and pilot station and moorage for pilots' boats from DNR (DNR 1997).

3.1.2.2 Recreation

There are no public recreation facilities on USCG AIRSTA/SFO Port Angeles. There are recreational facilities for USCG personnel, including a covered barbeque and picnic area, basketball hoop, horseshoe pits, and grassy areas.

West of the USCG AIRSTO/SFO Port Angeles entrance gate, Ediz Hook provides recreation opportunities and facilities for the public including two parks, a public boat launch, and a trail. Just west of the USCG facilities and the Puget Sound Pilots Station are Harborview Park and Ediz Hook Boat Launch. The 0.4-acre Harborview Park is on land owned by the Lower Elwha Klallam Tribe, and contains picnic tables, restrooms, and beach access (City of Port Angeles 2011a, 2011b, 2014b).

The Ediz Hook Boat Launch, located about 180 feet west of the existing USCG security gate, contains a restroom and a public boat launch with parking for about 50 vehicles with trailers (City of Port Angeles 2011a). The boat launch receives a consistent level of use, with 3,700 to 3,900 boats launched annually from the ramp in 2013 and 2014. The highest use occurred in May, when over 100 boats a day were launched (Washington Department of Fish and Wildlife [WDFW] 2014a).

Farther west on Ediz Hook is the Sail and Paddle Park, which contains picnic tables, an open grass area, and beach access for hand-launched watercraft (City of Port Angeles 2011a, 2014c). Both parks and the boat launch can be accessed via Ediz Hook Road or the Waterfront Trail, which is a 6.5-mile trail that runs from USCG AIRSTA/SFO Port Angeles to the Rayonier Mill site and connects to the Olympic Discovery Trail.

Other recreation activities that occur on or in the vicinity of Ediz Hook include fishing, boating (motorized/non-motorized), swimming, diving, picnicking, wildlife viewing, bird watching, and viewing scenery (City of Port Angeles 2011a).

Local scuba diving sites are located west of the public boat launch at an old dock and at the "rock pile" site located just off the end of the jetty where the Alternative 2 site is located. The rock pile was created by the USACE with excess riprap material from armoring the north side of Ediz Hook. This pile of rocks consists of excess riprap material left over from armoring the north shoreline of Ediz Hook and has developed into an artificial reef that supports a variety of sea life. This artificial reef is a popular dive location for both local and out-of-town divers. Access to the rock pile is by boat or by swimming from the Icicle Seafood staging area (Northwest Dive Club 2014).

3.1.3 Environmental Consequences

Impacts on land use would be significant if the Proposed Action were to:

- Conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project area.

- Conflict with any applicable habitat conservation plan or natural community conservation plan.
- Be incompatible with existing adjacent land uses such that the primary or critical land use activities would no longer be viable.

Impacts on recreation resources would be significant if the Proposed Action were to result in the loss of a designated recreation area or park.

3.1.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

Land Use

Construction activities would not conflict with applicable land use plans, policies, or regulations, or displace any adjacent land uses. Commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles (e.g., Puget Sound Pilots, Icicle Seafoods, Ediz Hook Boat Launch, and the Waterfront Trail) would experience temporary increases in noise levels, primarily during pile driving. However, noise-generating construction activities would be restricted to daytime hours (7:00 a.m. to 10:00 p.m.) and are therefore exempt from Washington State and City of Port Angeles noise regulations, and the temporary increase in noise levels would not be incompatible with existing adjacent land uses (see Section 3.4, *Noise*, for detailed information on construction noise and noise impacts). Construction activities would have no significant short-term impacts on land use under Alternative 1.

Recreation

Construction would not result in the loss of any recreational sites on Ediz Hook. Construction activities may have some temporary effects on the recreation experiences for visitors to Ediz Hook by generating noise and traffic and impairing views. These impacts would occur intermittently over the 18-month construction period. Noise from construction activities (e.g., pile driving, excavation, building construction) could be annoying to visitors who are engaged in quiet activities such as bird and wildlife viewing or seeking quiet and solitude. People at Harborview Park and the Waterfront Trail would be most impacted by noise (see Section 3.4, *Noise*, for detailed information on construction noise and noise impacts).

Construction would generate an increase in traffic on Ediz Hook Road. However, construction traffic would not substantially interfere with access to recreational facilities. Potential impacts would be primarily related to congestion through the Ediz Hook Boat Launch area just west of the entrance gate to USCG AIRSTA/SFO Port Angeles. To avoid congestion at the boat launch, construction vehicles would not stop within a 100-yard zone on the west side of the boat launch as they wait to clear the entrance gate. Construction vehicles awaiting entrance to USCG AIRSTA/SFO Port Angeles would wait on the shoulder of the road to allow users unrestricted access to the boat launch. Additionally, the construction contractor would coordinate with the City of Port Angeles to prepare a traffic control plan to minimize delays of traffic traveling to or accessing the boat launch. With these measures, construction traffic would not affect access to the boat launch or have a significant impact on recreational use.

Construction sites are typically out of place with their surroundings and visibly change the character and views of a site. Recreationists may find that construction at the site disrupts and impairs their views. This could affect people in watercraft, or at Harborview Park and the Waterfront Trail.

Small non-motorized craft such as kayaks and canoes and the crew shells of the Olympic Peninsula Rowers may traverse close to the shore. People in these craft may be affected during construction since the construction area would be off-limits. These craft would have to traverse the area around the construction site at a greater distance from shore.

Operation/Long-term Impacts

Land Use

Under Alternative 1, approximately 1.5 acres of undeveloped land at USCG AIRSTA/SFO Port Angeles would be developed for the upland support facilities (i.e., AFF, RSA, and DFM storage tank), associated site improvements, and access to the TPS pier. The sheet pile abutment to protect the shore and approach trestle would permanently alter approximately 110 linear feet of shoreline currently hardened with riprap, and the TPS pier would add approximately 25,465 ft^2 of new overwater coverage within aquatic tidelands and bedlands in Port Angeles Harbor. The proposed TPS pier would be the third pier structure along a 1-mile stretch of shoreline at the end of inner Ediz Hook.

The new upland, shoreline, and in-water structures, and proposed operations and maintenance activities would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles lands. Alternative 1 would not displace any existing adjacent land uses and would be compatible with the City of Port Angeles zoning and land use designations on and adjacent to USCG AIRSTA/SFO Port Angeles. USCG AIRSTA/SFO Port Angeles is zoned Public Buildings and Parks (PBP). Buildings added to USCG AIRSTA/SFO Port Angeles under Alternative 1 would be similar to existing buildings on the site, with the addition of temporary living quarters for approximately 20 to 30 TPS personnel. These uses are generally compatible with prescribed uses in PBP zones, which allow for very low-density residential uses. Additionally, because USCG AIRSTA/SFO Port Angeles is an active military installation, additional TPS personnel on site while TPS vessels are in port would not result in a change in land use function. The harbor adjacent to USCG AIRSTA/SFO Port Angeles is zoned Industrial Heavy (IH). The proposed structures, operations, and maintenance activities under Alternative 1 would be compatible with the goals and policies for industrial zoned lands in the city's Comprehensive Plan, which include locating industrial activity adjacent to the harbor (City of Port Angeles 2010). Similar to the existing T-Pier, the TPS pier would be compatible with prescribed uses for IH zones, which allow for heavy industry with adverse impacts. The SMP designates the shorelines at USCG AIRSTA/SFO Port Angeles as High-Intensity Marine, which allows for high-intensity, water-oriented commercial, transportation, recreation, and industrial uses while protecting or restoring ecological functions. Operation of the TPS pier would be compatible with this use. Overall, the proposed structures, operations, and maintenance activities under Alternative 1 would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles lands, would be typical of existing activities on the site, would not result in a perceptible change in land use function, and would be compatible with applicable zoning and land use designations on and adjacent to the project site.

Under Alternative 1, the TPS pier would extend into submerged land under the jurisdiction of DNR (in waters deeper than -24 feet MLLW). The TPS pier would extend approximately 40 feet into the area leased by DNR to Icicle Seafoods for their floating fish pens. This could potentially affect ongoing and future use of DNR's aquatic lease area near the TPS pier by constraining the location or configuration of aquaculture operations within the lease area. Alternative 1 was designed to minimize the distance the TPS pier would extend into the aquatic lease area to the

extent feasible given the depth requirements needed for safe maneuvering of the TPS vessels as they navigate to and from port.

As part of the proposed mitigation described in Section 2.6, removal of fill at the Icicle Seafoods laydown area would affect existing land uses in DNR aquatic tidelands. However, removal of this fill, and removal of fill associated with the existing jetty on USCG AIRSTA/SFO Port Angeles, would be consistent with the City of Port Angeles' (2010 and 2011a) and DNR's goals of removing fill and decaying structures, and restoration of the shoreline on Ediz Hook.

Recreation

Alternative 1 would not alter or displace any existing recreational sites, facilities, or uses on Ediz Hook in upland areas or on the shoreline. However, kayakers and other recreational boaters that navigate along the south shore of Ediz Hook would be restricted from entering the NVPZ while BVs are moored, and from entering the security zone that the USCG would establish around the TPS pier after it is constructed (see Section 2.7). This would reduce the aquatic areas open to public use by recreational boaters along the south shore of Ediz Hook adjacent to USCG AIRSTA/SFO Port Angeles in the future. However, this would not result in the loss of any designated recreation area or park, and would not be a significant impact on recreation.

Conclusion

Under Alternative 1, new facilities, operations, and maintenance activities would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles, and would be compatible with City of Port Angeles zoning and land use designations on and adjacent to the project site that are outlined in the Comprehensive Plan (City of Port Angeles 2010), Zoning Code (2015), SMP (City of Port Angeles 2014a), and HRMP (City of Port Angeles 2011a). Alternative 1 would not displace existing land uses on or adjacent to the project site. The TPS pier could constrain the ongoing and future use of the DNR lease area by constraining the location or configuration of aquaculture operations within the lease area. There would be no significant long-term impact on land use. Alternative 1 would reduce public access by kayakers and other recreational boaters along the south shore of Ediz Hook adjacent to USCG AIRSTA/SFO Port Angeles, but would not result in the loss of a designated recreational area or park. There would be no significant impacts on recreation.

3.1.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Land Use

Construction impacts on land use would be similar to those described for Alternative 1. Commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles (e.g., Puget Sound Pilots, Icicle Seafoods, Ediz Hook Boat Launch, and the Waterfront Trail) would experience temporary increases in noise levels greater than under Alternative 1 because construction activities would be closer. Pile driving, which generates the highest noise levels, would last 1/5 the time required under Alternative 1. As with Alternative 1, noise-generating construction activities would be restricted to daytime hours (7:00 a.m. to 10:00 p.m.) and are therefore exempt from Washington State and City of Port Angeles noise regulations, and the temporary increase in noise levels would not be incompatible with existing adjacent land uses (see Section 3.4, *Noise*, for detailed information on construction noise and noise impacts). Construction activities would have no significant short-term impacts on land use under Alternative 2.

Recreation

Construction impacts on recreation would be similar to those described for Alternative 1, except that scuba divers would not be able to access the rock pile, and construction noise levels would be higher at nearby recreational areas. Construction of the approach trestle and pontoon would be directly over the rock pile, and it would be too dangerous to allow diving during pile driving and construction of the overwater structures.

Alternative 2 would generate the highest noise levels at nearby recreational areas (e.g., the eastern end of the Waterfront Trail, Ediz Hook Boat Launch, and Harborview Park) because it is the closest alternative site. The Alternative 2 site is approximately 350 feet away from the closest public access. Impacts could include moderate to high annoyance and greater interference with outdoor communication. However, the duration of pile driving would be the shortest under Alternative 2, at 15 days over a period of 5 weeks (1/5 the time required under Alternative 1). While construction noise could temporarily impact recreational activities on adjacent lands, it would not displace any recreational uses, and there would be no significant short-term impact on land use during construction.

Operation/Long-term Impacts

Land Use

Operation impacts on land use would be similar to those described for Alternative 1. The upland facilities under Alternative 2 would be identical in size and location to Alternative 1, and the same amount of open space at USCG AIRSTA/SFO Port Angeles would be developed for the upland support facilities, associated site improvements, and access to the TPS pier. However, under Alternative 2, the TPS pier would add approximately 29,976 ft^2 of overwater coverage within aquatic tidelands and bedlands within Port Angeles Harbor. This is approximately 22 percent more overwater coverage than Alternative 1.

Similar to Alternative 1, the new upland, shoreline, and in-water structures, and proposed operations and maintenance activities under Alternative 2 would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles lands. Alternative 2 would not displace any existing adjacent land uses and is generally compatible with the City of Port Angeles zoning and land use designations on and adjacent to the site. Impacts on land use from the proposed treaty mitigation to remove fill at the Icicle Seafoods laydown area would be the same as under Alternative 1. Because the Alternative 2 design utilizes the proposed compensatory mitigation site, if this alternative is selected, other compensatory mitigation would need to be developed in consultation with the USACE to compensate for impacts on aquatic resources.

Recreation

Alternative 2 would have impacts on recreation similar to Alternative 1. These impacts would be limited to a loss of public access by kayakers and other recreation boaters in aquatic areas along the south shore of Ediz Hook within the NVPZ while TPS vessels are in port and within the security zone that the USCG would establish around the TPS pier after it is constructed. In addition to this impact, under Alternative 2 the TPS pier would be located directly over the rock pile. For security reasons, scuba divers would not be allowed to dive on the rock pile. Although Alternative 2 would effectively result in the loss of a recreational area, the rock pile is not a designated recreation area and is not identified in the Parks and Recreation Element of the Comprehensive Plan for the City of Port Angeles (City of Port Angeles 2010) or the City of Port Angeles Parks and Recreation Master Plan (City of Port Angeles 2011b). Because the rock pile is not a designated recreation area and there are other opportunities for diving along the inside of Ediz Hook, there would be no significant impacts on recreation.

Conclusion

Under Alternative 2, new facilities, operations, and maintenance activities would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles, and would be compatible with City of Port Angeles zoning and land use designations on and adjacent to the project site that are outlined in the Comprehensive Plan (City of Port Angeles 2010), Zoning Code (2015), SMP (City of Port Angeles 2014a), and HRMP (City of Port Angeles 2011a). Alternative 2 would not displace existing land uses on or adjacent to the project site. There would be no significant long-term impact on land use. Alternative 2 would reduce public access by kayakers and other recreational boaters along the south shore of Ediz Hook adjacent to USCG AIRSTA/SFO Port Angeles, and public access to the rock pile dive site would be lost. However, because the rock pile is not a designated recreational area or park, there would be no significant impacts on recreation.

3.1.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Land Use

Construction impacts on land use would be similar to those described for Alternative 1. However, commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles would experience lower noise levels during construction, including pile driving, than under Alternative 1 due to the greater distance from construction. As under Alternatives 1 and 2, noise-generating construction activities would be restricted to daytime hours (7:00 a.m. to 10:00 p.m.) and are therefore exempt from Washington State and City of Port Angeles noise regulations, and the temporary increase in noise levels would not be incompatible with existing adjacent land uses (see Section 3.4, *Noise*, for detailed information on construction noise and noise impacts). Construction activities would have no significant short-term impacts on land use under Alternative 3.

Recreation

Construction impacts on recreation would be similar to those described for Alternative 1. Impacts on nearby public recreation from construction noise would be lower than under Alternatives 1 and 2 because of the greater distance of the Alternative 3 site to the Ediz Hook Boat Launch, Harborview Park, and Waterfront Trail. Under Alternative 3, scuba divers would be able to access the rock pile. While construction noise could temporarily impact recreational activities on adjacent land uses, it would not displace any recreational uses, and there would be no significant short-term impacts during construction.

Operation/Long-term Impacts

Operation impacts would be similar to those described for Alternative 1. Approximately 1.5 acres of open space would be developed for the upland support facilities, associated site improvements, and access to the TPS pier; the same as under Alternative 1. However, under Alternative 3, overwater coverage from the TPS pier would be the largest of the three alternatives: 30 percent larger than Alternative 1, and 10 percent larger than Alternative 2.

Similar to Alternatives 1 and 2, the new upland, shoreline, and in-water structures, and proposed operations and maintenance activities under Alternative 3 would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles lands. Alternative 3 would not displace any existing adjacent land uses and would be compatible with the City of Port Angeles zoning and land use designations on and adjacent to the site. Impacts on land use from the

proposed mitigation to remove fill at the existing jetty on USCG AIRSTA/SFO Port Angeles and the Icicle Seafoods laydown area would be the same as under Alternatives 1 and 2.

Recreation

Alternative 2 would have impacts on recreation similar to Alternative 1. These impacts would be limited to a loss of public access by kayakers and other recreation boaters in aquatic areas along the south shore of Ediz Hook within the NVPZ while TPS vessels are in port and within the security zone that the USCG would establish around the TPS pier after it is constructed. Alternative 3 would have no impact on scuba diver access to the rock pile. Alternative 3 would not result in the loss of any designated recreation areas or parks, and there would be no significant impacts on recreation.

Conclusion

Under Alternative 3, new facilities, operations, and maintenance activities would be consistent with the federally designated use of USCG AIRSTA/SFO Port Angeles, and would be compatible with City of Port Angeles zoning and land use designations on and adjacent to the project site that are outlined in the Comprehensive Plan (City of Port Angeles 2010), Zoning Code (2015), SMP (City of Port Angeles 2014a), and HRMP (City of Port Angeles 2011a). Alternative 3 would not displace existing land uses on or adjacent to the project site. There would be no significant long-term impact on land use. Alternative 3 would reduce public access by kayakers and other recreational boaters along the south shore of Ediz Hook adjacent to USCG AIRSTA/SFO Port Angeles. However, this would not result in the loss of any designated recreation area or park, and would not be a significant impact on recreation.

3.1.3.4 No Action Alternative

Land Use

Under the No Action Alternative, a pier and support facility for the TPS would not be built, and land uses in the area would remain unchanged.

Recreation

Under the No Action Alternative, a support facility for the TPS would not be built and recreation in the area would not change.

Conclusion

Under the No Action Alternative, there would be no changes to land use and recreation, and therefore no significant impact on land use and recreation.

3.2 Water Quality and Sediments

This section addresses water quality and sediments in Port Angeles Harbor. No other surface waters or groundwater resources would be affected by the Proposed Action. Sediments are evaluated in the biologically active zone of substrate in the harbor. The biologically active zone is the area within the sediment where the majority of benthic macroinvertebrates are generally found. This is generally within the upper 4 inches in marine sediment, but can be adjusted to the site (Ecology 2015a). In some locations in Western Washington, sediment sampling where geoduck clams are present has been set from about 18 inches to 3 feet, and sediment caps have been designed to accommodate the biologically active zone of geoduck clams at depths up to 4 feet (Ecology 2014a).

3.2.1 Regulatory Setting

3.2.1.1 Water Quality

Water quality describes the chemical and physical composition of water as affected by natural conditions and human activities. Washington surface water quality standards contained in WAC-173-210A provide the basis for protecting and regulating the quality of surface waters in Washington State. The standards implement portions of the federal CWA by specifying the designated and potential uses of water bodies in the state. They set water quality criteria to protect those uses and acknowledge limitations. The standards also contain policies to protect high-quality waters (antidegradation) and specify how criteria are to be implemented.

The federal CWA requires that all states restore their waters to be "fishable and swimmable." Section 303(d) of the CWA establishes a process to identify and clean up polluted waters. Every two years, all states are required to perform a water quality assessment of the quality of surface waters in the state, including all the rivers, lakes, and marine waters where data are available. Ecology compiles its own water quality data, and invites other groups to submit water quality data they have collected.

Waters whose beneficial uses—such as for drinking, recreation, aquatic habitat, and industrial use—that are impaired by pollutants are placed in the "polluted water" category (Category 5) on the water quality assessment. Categories range from Category 1, waters that meet tested standards for clean waters, to Category 5, waters that fall short of state surface water quality standards and are not expected to improve within the next two years. The 303(d) list is comprised of waters that have been designated as Category 5, impaired.

Waters placed on the 303(d) list require the preparation of a water cleanup plan, such as a total maximum daily load (TMDL). The TMDL identifies how much pollution needs to be reduced or eliminated to achieve clean water. It identifies the maximum amount of a pollutant allowed to be released into a water body so that the beneficial uses of the water are not impaired.

The CWA contains the requirements to set water quality standards for all contaminants in surface waters. EPA is the designated regulatory authority to implement pollution control programs and other requirements of the CWA. However, EPA has delegated regulatory authority for the CWA to Ecology for implementation of pollution control programs, as well as other CWA requirements.

The addition of the 10,000-gallon DFM tank would raise the total amount of oil stored at AIRSTA/SFO Port Angeles above 42,000 gallons and require preparation of a Facility Response Plan. Section 311 of the CWA requires facilities that store oil in significant amounts (over 42,000 gallons) prepare spill prevention plans and adopt certain measures to keep accidental releases from reaching navigable waters. The Facility Response Plan provides for spill response actions, staff qualifications/training, and regular updates in accordance with EPA guidelines.

3.2.1.2 Sediments

The Washington State Sediment Management Standards (SMS) (WAC 173-204) provide the framework for the long-term management of marine sediment quality. The SMS were developed to reduce and ultimately eliminate adverse effects on biological resources and significant threats to human health from surface sediment contamination. The SMS take into account benthic, upper trophic level, and human health criteria. The two-tier framework establishes a lower level Sediment Cleanup Objective (SCO) and an upper level Cleanup Screening Level (CSL), with the SCO being the long-term sediment quality goal (Ecology 2013).

Ecology has given Port Angeles Harbor an excellent water quality designation for aquatic life uses. This designation requires any action affecting the harbor to maintain the standards for excellent water quality, which include the following:

- Temperature — 61 degrees Fahrenheit (°F) (highest 1-day maximum)
- Dissolved Oxygen — 6.0 mg/L (lowest 1-day minimum)
- Turbidity — +5 Nephelometric turbidity units (NTUs) or 10% (not to exceed)
- pH — 7.0 to 8.5

In addition, Ecology has designated the harbor for the following uses: primary and secondary recreational contact, shellfish harvesting, wildlife habitat, commerce and navigation, boating, and aesthetics (WAC 173-201A-210).

3.2.2 Affected Environment

The affected environment includes Port Angeles Harbor, as there are no other surface water bodies or groundwater resources in the project area (specifically, on Ediz Hook). For the purposes of this EA, Port Angeles Harbor is divided into the southern, western, central, northern, and outer harbor areas (see Figure 3.2-1). The alternative sites are located in the northern harbor area.

3.2.2.1 Tides and Circulation

The patterns of currents in Port Angeles Harbor are driven by the tidal flow in the Strait of Juan de Fuca (U.S. Department of the Interior [USDOI] 1967; Ebbesmeyer et al. 1979; Newfields 2012). During flood-tide, a large eddy is established between Dungeness Spit and Ediz Hook that extends a short way into the harbor and circulates water in a clockwise direction (Ebbesmeyer et al. 1979; Yang et al. 2004). The duration of the eddy typically lasts 6 hours during the flood period (Yang et al. 2004). The direction of the eddy is driven by water moving along the northern edge of the harbor during flood tides and along the southern edge of the harbor during ebb tides (USDOI 1967). The eddy circulates at a slower rate than the flows outside the harbor and is constrained by the size of the harbor itself. Surface currents within the harbor are generally slow (less than 0.8 feet/sec) with long periods of slack water, especially in the northern and western portions of the Harbor (USDOI 1967).

Shoreline modifications on the south side of Ediz Hook—armoring and jetties in particular—likely have a small, localized effect on currents (The Watershed Company 2010). Based on a review of recent aerial photographs, features in the area that could influence local currents include the following: (1) a wave barrier on the west side of the USCG dock that is roughly 160 feet long; (2) the pile-supported USCG T-Pier, which extends almost 200 feet into the harbor; (3) the rock riprap jetty just east of the USCG AIRSTA/SFO Port Angeles entrance gate (in the

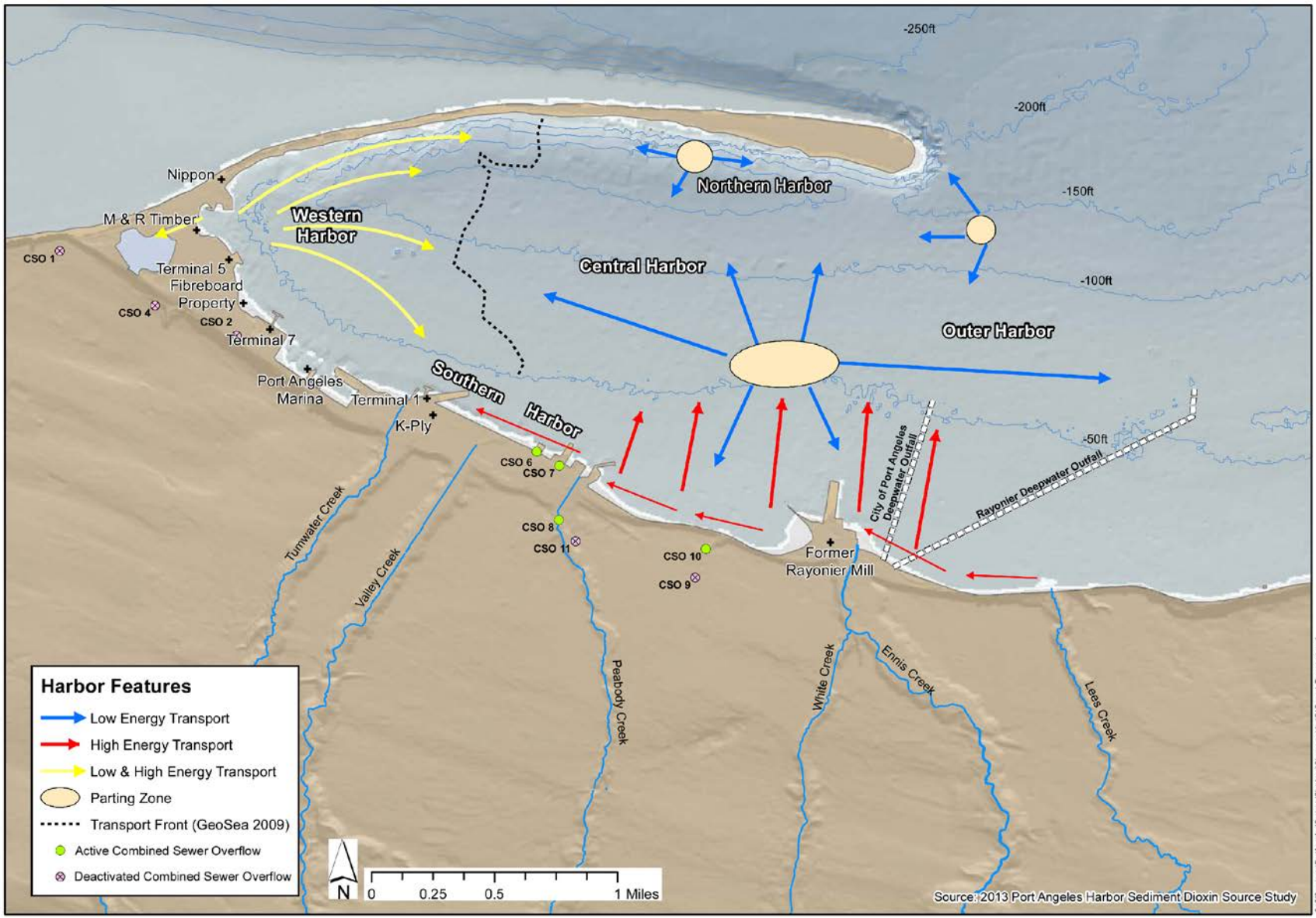

Figure 3.2-1. Water Circulation and Sediment Transport in the Project Area

vicinity of the Alternative 2 site); (4) the laydown area for the fish pens located west of the Puget Sound Pilots Station; and (5) the Pilots Station dock, which is about 260 feet long and is located to the west of the existing rock riprap jetty. The rock riprap jetty, breakwater, and fish pen laydown area create areas of slack water during tidal shifts. The dock piles create eddies around the piles, but generally have little effect on tides and currents beyond the end of the dock.

The in-water piles could alter currents and circulation based on the tidal event, depth of water, storm events, and time of year. In a recent study of currents at a trestle pier for a liquid natural gas facility (Hatch 2014), it was found that the average circulation with and without the trestle piles was similar or the same in deeper water (approximately 26 feet deep). For the trestle piles in the shallower areas (approximately 16 feet deep), the piles resulted in a temporary slowing of the current in the vicinity of the piles by as much as 19 inches/second during the average circulation period (at a distance of 410 feet up and down-current from the pier). During the maximum current event (a storm), the difference in the current was as much as 6.7 inches/second for the trestle piles as compared to no piles. Hatch (2014) shows a negligible effect to the current offshore from the pier. Because the proposed pier is in deeper water (greater than 26 feet deep), no effects to currents are anticipated.

Waves also affect circulation patterns. Waves produced by strong winds can induce bottom currents capable of re-suspending surface sediments in the shallow southern harbor area (Herrera 2011). These wind-induced waves can also strengthen the bottom currents responsible for sediment transport in the deeper parts of the harbor. Large wind-driven waves from the northeast, as well as refraction of the swell entering the harbor from the Strait of Juan de Fuca, result in westward longshore sediment transport along the southern harbor toward the western harbor (Newfields 2012).

Three spatially segregated sediment transport regimes in the southern, western, and central harbor areas transport sediment from sources to sinks (see Figure 3.2-1). In this figure, a parting zone refers to areas where sediment is both collected and dispersed. The transport front shows the division between sediment movement in the central and western harbor; sediments are unlikely to move between these two areas. In the southern harbor under low-energy conditions, particles entering the harbor from creeks or outfalls are deposited close to the discharge point. Fine-grained material may move in several directions subject to weak wind and tidal conditions. Sediment deposition continues this way until the onset of a high-energy storm event.

Larger storm events deliver fine and heavier grained sediment to the southern harbor. This influx of sediment is subjected to the higher wind- and wave-induced transport mechanisms that do not typically occur during low-energy conditions. Waves produced by strong winds can induce bottom currents capable of re-suspending sediments in the shallow southern harbor (Herrera 2011). These wind-induced waves can also enhance the bottom currents responsible for sediment transport in deeper areas of the harbor. Large wind-driven waves from the northeast, as well as the swell entering the harbor from the Strait of Juan de Fuca, result in westward longshore sediment transport in the southern harbor area.

The western harbor extending out approximately 1 mile from the shoreline serves as the long-term sink for depositional sediment within the harbor (see Figure 3.2-1). During low-energy conditions, sources of sediment are from nearby outfalls and sediment is deposited in close proximity to the discharge point. Under high-energy conditions, in addition to nearby outfalls, sediment is delivered by longshore transport from other areas of the harbor to the western

harbor. As sediment accumulates in the western harbor, intermittent mudflows occur to the east toward the central harbor and typically go no farther than one mile from the western shoreline.

In the central harbor area, both sediment depositional and sediment dispersal processes occur. This area is in a state of dynamic equilibrium with respect to sediment movement (GeoSea 2009). During higher energy events, sediment is eroded, particularly in the shallower areas of the southern harbor, and at the same time sediment is deposited from the higher sediment load from higher stormwater runoff rates entering the harbor from creeks and combined sewer overflows (CSOs).

Circulation patterns have a variety of influences on local water quality. The higher velocities reduce residence times, increase the re-suspension and transport of sediment, and more rapidly disperse pollutants. Lower velocities result in more deposition, less mixing, longer residence times, and lower transport rates. Near the project area, the net direction of sediment movement is from the tip of Ediz Hook toward the west (Ecology 2014b).

3.2.2.2 Water Quality

The majority of chemicals of potential concern and sediment sources to Port Angeles Harbor are located along the southern harbor shoreline, or in upland areas that contribute to runoff that enters the harbor along the southern shoreline (Ecology and Environment, Inc. 2008). Sources include CSOs, industrial outfalls, and runoff from residences and commercial areas that is transported to the harbor by creeks. Historically (between 1937 and 1972), five nearshore outfalls discharged untreated mill effluent into the harbor. After this period and until 1997 (when the mill was shut down), treated mill effluent was discharged through a deep water outfall.

Ecology's water quality status report (303d list) identifies several Category 5 ratings in Port Angeles Harbor (Ecology 2014c). Water in the western harbor has a Category 5 rating due to low dissolved oxygen levels from decaying wood debris in this area. Water in the southern harbor has a Category 5 rating due to the occasional presence of enterococcus and fecal coliform bacteria from CSOs onto Hollywood Beach (Ecology 2014c).

Water quality in the project area is strongly tied to water quality in the Strait of Juan de Fuca, which is good. The project area is located where greater mixing in the water column occurs, as well as tidal flushing (Floyd Snider 2007). Thus, it is not anticipated that there are water quality concerns at the eastern end of Ediz Hook in the vicinity of the project area.

In addition to the Category 5 ratings for water, there are also Category 5 ratings in the 303d list for the contaminants found in the tissue of clams and mussels. Contaminants in concentrations that exceed the National Toxics Rule criteria include benz[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[k]flourathene, and chrysene. The locations of these high ratings are near the Rayonier site in the southern harbor and in the western and central harbor.

3.2.2.3 Sediment Quality

Ecology's Puget Sound Initiative (Ecology 2014d) identifies Port Angeles Harbor as a priority bay for sediment cleanup, because of legacy sediment contamination above the Washington State SMS. Ecology identified two sites in the Port Angeles Harbor that require remedial action: the western harbor area, and the Rayonier Mill site in the southern harbor.

In 2008, Ecology launched a sediment investigation of the western Port Angeles Harbor and developed a strategy to clean up the harbor by identifying potentially liable parties (PLPs) and a remedial strategy. An Agreed Order issued by Ecology was signed on May 28, 2013 between PoPA, Georgia-Pacific LLC, Nippon Paper Industries, the City of Port Angeles, and Merrill & Ring (Ecology 2014e). These are the listed PLPs responsible for remedial action in the western

portion of Port Angeles Harbor. A Remedial Investigation was completed in 2013 by the PLPs (Ecology 2014e). A Remedial Investigation/Feasibility Study for this area has not yet been published.

The Rayonier Mill site on the southern shoreline of Port Angeles Harbor is the second identified sediment cleanup site in the harbor. In 2010, Rayonier signed an Agreed Order with Ecology to prepare an interim action plan for the Rayonier Mill Study Area. The full extent of the Rayonier Mill Site has not been determined, and an additional order is needed to implement the plan (Ecology 2016). Ecology completed sediment investigations in 2008, and all existing marine data were compiled in the Marine Data Summary Report in November 2014 (Windward 2014). Ecology expects to release the public comment report for the Marine Data Summary Report in 2016 (Ecology 2016).

Surface and subsurface sediment in Port Angeles Harbor has been affected by historical industrial activities near the western portion of Port Angeles Harbor and the activities at the Rayonier Mill site located south of Ediz Hook as described above. The sediment quality within Port Angeles Harbor is above the Washington State SMS cleanup levels based on benthic toxicity (Ecology 2012b). A sediment investigation that focused on several areas within the Port Angeles Harbor identified several contaminants of concern (Ecology 2012c):

- Dioxins and furans
- Polychlorinated biphenyls (PCBs)
- Semi-volatile organic compounds
- Ammonia and sulfides
- Metals (arsenic, mercury, and zinc)
- Petroleum hydrocarbons

A 2013 sediment source survey found dioxins/furans in sediments above background levels in samples located approximately 1/2 mile to the south of USCG AIRSTA/SFO Port Angeles and 1 mile west of the base (Newfields 2013). The study interpolated that dioxins/furans were likely spread throughout the harbor, and noted the following: *Federal and state environmental regulatory and health agencies are interested in dioxins/furans because they are toxic to humans and wildlife. Once released into the environment, dioxins/furans resist degradation, do not dissolve in water, and attach strongly to particles such as soil, dust, and sediment* (Newfields 2013). Dioxins/furans are present at some level throughout the environment in air, food, water, soils, and sediments; however, they have been declining since the 1970s due to improved pollution control. Sampling for several other chemicals was also conducted, and PCBs were also detected in the harbor sediments. The greatest concentrations of dioxins/furans and PCBs were in the western harbor and near the Rayonier Mill site.

Surface sediments near the project area generally consist of sand and silt, with increasing amounts of gravel closer to the shoreline. Three surface sediment samples collected in a 2012 sediment investigation, located within 1,000 feet of each of the three alternative sites, were not found to exceed benthic criteria. This investigation did not include an evaluation of human health criteria under the revised SMS (Ecology 2016). Surface sediment results may not be a good indicator of the potential for underlying subsurface contamination (Ecology 2012b); however, subsurface sediment samples indicate that sediments are less impacted farther from the source areas, which in this case are located well away from the project area (e.g., the Rayonier Mill on southern shore and Nippon Paper on the western shore).

Turbidity is a measure of the amount of light scatter related to total suspended solids in the water. The suspension of fine-grained sediments can affect water quality in several ways. The

re-suspension of organically rich sediments can cause increased biological oxygen demand and result in lowering the dissolved oxygen concentration. Also, turbidity reduces light penetration into the euphotic zone (i.e., close to the water surface) causing a reduced rate of photosynthetic production of oxygen. Oxygen production by rooted aquatic plants may be impacted by a loss of habitat in the euphotic zone.

Suspended particles can also contribute to pollution impacts by binding contaminants such as heavy metals, PCBs, pesticides, and some radionuclides. Nutrients may absorb onto fine-grained particles or be desorbed from them. Contaminants are affected by the distribution and transport of fine suspended sediments. Often, contaminants are transferred to higher trophic levels by their association with suspended particles that are ingested by filter feeders. Such increases in concentration at each trophic level are referred to as "biological magnification" (Schubel 1977). Other effects of turbidity include disruptions to food web dynamics through decreased predator feeding success and enhanced prey survival (Vineyard and O'Brien 1976) (see Section 3.3, *Biological Resources*, for further discussion of turbidity effects on fish).

3.2.3 Environmental Consequences

The evaluation of impacts on marine water quality and sediments considers whether construction activities and operations associated with the Proposed Action would create conditions, such as water or sediment contamination or physical changes, that violate state standards. Impacts would be considered significant if they violated state water quality or sediment quality standards (Surface Water Quality Standards, WAC 173-201A; Sediment Quality Standards, WAC 172-204-320) or reduced Port Angeles Harbor's ability to support its designated uses. Based on the absence of chemical contamination in nearby surface sediment samples, the analysis of environmental consequences focuses on the physical effects of sediment disturbance and water quality impacts during construction and operations.

3.2.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

<u>Construction/Short-term Impacts</u>

Impacts on water quality would be limited to short-term and relatively localized turbidity changes resulting from the re-suspension of bottom sediments caused by pile driving and barge and tug operations, including propeller wash and anchoring. This alternative would produce the most turbidity out of the three action alternatives because the greatest number of piles would be needed. In the project area, periods of higher currents and tidal change would provide adequate mixing in the water column to diminish turbidity effects, and a Sediment Management Plan would be implemented to control the spread of sediments. There is some potential for spills of construction materials or leaks from construction equipment such as hydraulic fluid, oil, concrete, or other matter into the water. Spills and leaks may have small localized effects on water quality, which would dissipate rapidly due to mixing in the water column and have no lasting effects. BMPs would be in place during the in-water and overwater construction to avoid or minimize spills into the water (see Chapter 2 for a list of BMPs). A SWPPP would be implemented that includes specific erosion control measures to prevent the release of soil and other pollutants into surface water via stormwater runoff from construction sites.

There would be no planned direct discharges of wastes or contaminants to sediments during construction.

<u>Operation/Long-term Impacts</u>

The in-water structures would have some localized effect on circulation, mainly creating small eddies around the piling during tidal movements. However, these effects should not decrease

longshore currents south of the new pier extent; if anything, the new pier might marginally accelerate the current as it passes the southern extent. Longshore currents are possibly already being diverted from the nearshore by the wave attenuator wall at the existing USCG T-Pier. The removal of existing in-water structures along the inner shore of Ediz Hook in the North Harbor area is being considered as compensatory mitigation for the loss of aquatic resources and treaty mitigation (see Section 2.6). This mitigation would include removing the rock-lined jetty on inner Ediz Hook and the Icicle Seafoods laydown area. These in-water structures currently affect circulation in the North Harbor area. Their removal would offset the localized circulation impacts created by the piling of the proposed pier and would provide an overall benefit to circulation in the North Harbor area.

Although the new piling would create localized circulation impacts, these impacts are not expected to influence the area waterward of the new pier nor affect the longshore currents in the area of the Icicle Seafoods fish pens.

The steel piles proposed for the project are composed of iron and carbon that corrode over time and leach metals into the water. However, the steel piles would have an aluminum coating to slow the rate of corrosion and avoid adversely affecting water quality. Corrosion would not cause water quality parameters to be violated.

Alternative 1 would generate stormwater runoff from the pier. The pier would be sloped to capture stormwater, which would be filtered for basic treatment prior to discharge into the harbor per Ecology's SWMMWW (Ecology 2012a). On upland areas, stormwater would be collected and infiltrated into the ground, with no direct discharge to the harbor.

During long-term operations and maintenance, there would be a potential for spills associated with the DFM storage tank and with supplying and distributing fuels from the DFM fueling system. TPS vessels would be fueled at the new pier, but the large blocking vessels would not. The smaller vessels that would be fueled at the new pier are currently being fueled at existing Port Angeles Harbor facilities. The new facility would be built with state-of-the-art purpose-built equipment to fuel the vessels, minimizing spill potential. The DFM storage tank would be placed on an 8-foot by 27-foot concrete pad with curbing to contain spills. Stormwater runoff from the fueling area would be captured and run through an oil/water separator. Catch basins in the concrete pad would be connected by pipe to a coalescing oil/water separator, with stormwater piped to a small, shallow infiltration with a bioretention mix to provide the Basic Treatment required by Ecology. The USCG would implement BMPs and fueling safeguards to avoid and minimize the risk of spills. Measures would include the placement of containment booms around vessels in advance of fueling operations and reporting of spilled oil or other hazardous substances in accordance with 40 CFR 112.4. In the event of a spill, the USCG would implement response measures in accordance with the existing Spill Prevention, Control, and Countermeasures (SPCC) Plan (USCG 2015).

Conclusion

Changes to water quality would be temporary, small, and localized. Impacts would not violate federal or state standards for water quality or sediment. Alternative 1 would not have a significant impact on water quality or sediments. The removal of existing in-water structures on inner Ediz Hook in the North Harbor area as compensatory mitigation n for the loss of aquatic resources and treaty mitigation (see Section 2.6) would offset localized circulation impacts from the proposed pier, and would have an overall benefit on water quality and sediments from improved circulation. The new pier is not expected to affect the longshore current at the Icicle Seafoods fish pens.

3.2.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Potential construction impacts on water quality and sediments would be similar to those described for Alternative 1. There would be less turbidity created from pile driving as compared to Alternative 1 due to fewer piles required for Alternative 2 (144 in-water piles for Alternative 1 compared to 17 piles for Alternative 2). This alternative would create some additional turbidity impacts separate from pile driving caused by the removal of the bulkhead at the end of the jetty (piles would be cut off below the mud line). Even though there would be a temporary increase in turbidity, turbidity impacts would be short term and localized, as suspended sediments would disperse with tidal flow and currents, and a Sediment Management Plan would be implemented to control the spread of sediments. Other construction impacts and construction BMPs would be similar to those under Alternative 1.

Operation/Long-term Impacts

Similar to Alternative 1, the new in-water structure would have a localized effect on water circulation due to the new piles. There would be more impact on surface currents compared to Alternative 1 due to the greater area of the floating pontoon, which would sit on the surface and approximately 10 feet below the water level. This would create some localized splitting of the surface current, and the northern-most fish pens closest to the Alternative 2 site may experience a small acceleration in the surface current as it is diverted from the pontoon. Other operational impacts and the proposed treaty mitigation would be identical to those under Alternative 1. Because the Alternative 2 design utilizes the proposed compensatory mitigation site, if this alternative is selected, other compensatory mitigation would need to be developed in consultation with the USACE to compensate for impacts on aquatic resources.

Conclusion

Changes to water quality would be temporary, small, and localized. Impacts would not violate federal or state standards for water quality or sediment. Alternative 2 would not have a significant impact on water quality or sediments. The removal of existing in-water structures on inner Ediz Hook in the North Harbor area as treaty mitigation (see Section 2.6) would offset localized circulation impacts created by the piling and impacts on the surface current from the floating pontoon, and would have an overall benefit on water quality and sediments from improved circulation. Alternative 2 would not have an adverse effect on longshore currents.

3.2.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Potential construction impacts on water quality and sediments would be similar to those described for Alternative 1. There would be less turbidity created from pile driving compared to Alternative 1 because fewer piles would be required (144 in-water piles for Alternative 1 compared to 57 in-water piles for Alternative 3 [17 for the pier and 40 for the breakwater]). Although there would a temporary increase in turbidity, turbidity impacts would be short term and localized, as suspended sediments would disperse with tidal flow and currents, and a Sediment Management Plan would be implemented to control the spread of sediments. Other construction impacts and construction BMPs would be similar to those under Alternatives 1 and 2.

Operation/Long-term Impacts

Alternative 3 would have the greatest effect on circulation and sediment transport due to the breakwater. The current at the breakwater would be diverted around and under the structure (the structure would not extend to the bottom). The breakwater would have some localized effect on sediment transport since it would create an area of relative calm behind the breakwater, which would allow the settlement of heavier grained sediment. Other operational impacts and the proposed compensatory mitigation and treaty mitigation would be identical to those under Alternative 1. No effects on water velocities at the fish pens are expected since the new pier would be more than 2,500 feet east of the nearest pens and would not extend south far enough to provide an obstruction to a longshore current running east-west.

Conclusion

Similar to Alternatives 1 and 2, Alternative 3 would cause short-term changes to water quality. However, these changes would not violate federal or state standards for water quality or sediment. Therefore, Alternative 3 would not have a significant impact on water quality or sediments. The removal of existing in-water structures on inner Ediz Hook in the North Harbor area as compensatory mitigation for the loss of aquatic resources and treaty mitigation (see Section 2.6) would offset localized circulation and sediment transport impacts created by the piling and breakwater, and would have an overall benefit on water quality and sediments from improved circulation. The Alternative 3 pier is more than 2,500 feet east of the nearest Icicle Seafoods fish pens and is not expected to have an effect on the longshore current.

3.2.3.4 No Action Alternative

Under the No Action Alternative, there would be no in-water construction or new in-water structures that would impact water circulation, water quality, or sediment quality. The No Action Alternative would have no impact on water quality or sediments.

3.3 Biological Resources

This section describes the regulatory setting, affected environment, and environmental consequences of the Proposed Action on biological resources in the action area. For the analysis of biological resources, the action area includes the three dimensional extent of all physical, biological, and chemical effects of the Proposed Action on the environment. The action area includes, but is not limited to, all project components, including equipment staging, roads used by the project, water bodies and uplands affected by the project, and mitigation sites (if applicable). The farthest reaching impact of all project activities was determined to be the temporary extent of airborne and underwater noise from pile driving at the USCG AIRSTA/SFO Port Angeles site. The action area for the Proposed Action is therefore defined as the combination of the farthest extent of airborne and underwater noise associated with proposed pile driving (see Section 3.3.3, *Environmental Consequences)*. In addition, the project area is defined as the area within the immediate vicinity of proposed in-water and upland activities on Ediz Hook associated with the Proposed Action.

3.3.1 Regulatory Setting

The analysis of biological resources focuses on the potential impacts on fish and wildlife and habitat under the following regulatory laws:

- Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703–712)
- Bald and Golden Eagle Protection Act (16 U.S.C. 668–668d)
- Endangered Species Act (ESA) (16 U.S.C. 1531 et seq.)
- Marine Mammal Protection Act (MMPA) (16 U.S.C. 1361 et seq.)
- Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801–1884)

3.3.1.1 Migratory Bird Treaty Act

The MBTA of 1918 is the primary U.S. legislation established to protect migratory birds. Migratory birds are any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual lifecycle. The MBTA protects and prohibits the “take” of over 800 species of birds. Under 50 CFR 10.12 “take” means to pursue, hunt, shoot, wound, kill, trap, capture or collect (collect only applies to nests [U.S. Fish and Wildlife Service [USFWS] 2003]) migratory birds, or to attempt of any of these, unless permitted by regulation. The current list of species protected under the MBTA was released in November 2013 (USFWS 2013). USCG AIRSTA/SFO Port Angeles is located in western Washington State which generally falls within the Pacific Migratory flyway. Birds utilize this flyway primarily in the fall and spring during their southward and northward migrations, respectively.

3.3.1.2 Bald and Golden Eagle Protection Act

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are afforded federal protection by the Bald and Golden Eagle Protection Act. This law prohibits anyone from taking, possessing, or transporting a bald eagle or golden eagle, or the parts, nests, or eggs of such birds, without prior authorization. This includes inactive nests as well as active nests. To “take” means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, or disturb. To “disturb” means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with the normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. Although bald eagles regularly occur in Port Angeles Harbor,

golden eagles are considered very rare transient visitors to the Port Angeles Harbor area and are not addressed further in this EA.

3.3.1.3 Endangered Species Act

Federally listed threatened and endangered species are those listed for protection under the federal ESA. The USFWS and the National Marine Fisheries Service (NMFS) jointly administer the ESA and are also responsible for the listing of species (i.e., the labeling of a species as either threatened or endangered). The USFWS has the primary management responsibility for terrestrial and freshwater species, while NMFS has primary responsibility for marine species and anadromous fish species (species that migrate from saltwater to freshwater to spawn). The ESA allows the designation of geographic areas as critical habitat for threatened and endangered species as well as the protection from "take." Under ESA, to "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Section 7(a)(2) of the ESA requires federal agencies to consult with USFWS and NMFS to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such a species. A Biological Assessment and Essential Fish Habitat assessment (BA-EFHA) will be submitted to NMFS and USFWS for the Proposed Action.

3.3.1.4 Marine Mammal Protection Act

The MMPA of 1972 established, with limited exceptions, a moratorium on the "taking" of marine mammals in waters or on lands under U.S. jurisdiction. To "take," as defined in Section 3 of the MMPA, means "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill" any marine mammal. "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of harassment, Level A (potential injury) and Level B (potential behavioral disturbance).

3.3.1.5 Section 101(a) (5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing), if certain findings are made and regulations are issued. Permission will be granted by the Secretary for the incidental take of marine mammals if the taking will have a negligible impact on the species stock and will not have an immitigable adverse impact on the availability of such species or stock for taking for subsistence uses. In accordance with the MMPA, the Navy has applied for an Incidental Harassment Authorization (IHA) for potential Level B behavioral harassment of marine mammals from pile driving noise (Navy 2016).Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires that regional Fishery Management Councils (FMCs), through federal Fishery Management Plans (FMPs), describe and identify Essential Fish Habitat (EFH) for each federally managed species; minimize, to the extent practicable, adverse effects on such habitat caused by fishing; and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802[10]). The term "fish" is defined in the MSA as "finfish, mollusks, crustaceans, and all other forms of marine animals and plant life other than marine mammals and birds." The regulations for implementing EFH clarify that "waters" include all aquatic areas and their biological, chemical, and physical properties, while "substrate" includes the associated biological communities that make these areas suitable fish habitats (50

CFR 600.10). Habitats used at any time during a species' life cycle (i.e., during at least one of its life stages) must be accounted for when describing and identifying EFH (NMFS 2002).

Pursuant to the MSA, the Pacific FMC (PFMC) has designated EFH for federally managed species within the waters of Washington, Oregon, and California. The waters of the greater Puget Sound and the project area are designated EFH for Pacific Coast groundfish, coastal pelagic species, and Pacific Coast salmon (PFMC 2011a, 2014a, 2014b).

3.3.2 Affected Environment

This section describes the terrestrial and aquatic species that occur within the action area where potential direct or indirect impacts on biological resources may occur from proposed construction and operation activities associated with the Proposed Action. For the purposes of this EA, biological resources are divided into six categories: (1) birds, (2) marine vegetation, (3) marine invertebrates, (4) marine fish, (5) special-status species, and (6) EFH. Because the upland portion of the project area is predominantly developed and landscaped, and in general provides sparse habitat for wildlife species other than birds, the following discussion of terrestrial species presence is focused solely on birds (i.e., shorebirds, seabirds, and waterfowl) that occur along Ediz Hook and the marine waters of Port Angeles Harbor. Aquatic species described include marine vegetation as well as marine fish and invertebrates. Special-status species are those species listed as threatened or endangered under the ESA, or proposed as such, including associated designated critical habitat; marine mammals listed under the MMPA; and the bald eagle. Lastly, EFH is analyzed and summarized as required under MSA, with more detailed analysis provided in a separate BA-EFHA (Appendix B).

3.3.2.1 Birds

More than 180 bird species (including shorebirds, wading birds, waterfowl, seabirds, and raptors) potentially occur in the action area. These birds utilize the shorelines and adjacent marine environment for foraging, nesting, wintering, and/or migration. Table 3.3-1 lists the more common species that have been observed over the last five years within the vicinity of Ediz Hook and the associated marine waters and the corresponding months in which they have been sighted (Seattle Audubon Society 2014; eBird 2015). All of these species except for the European starling are protected under the MBTA.

Bald Eagle

The bald eagle is protected under the Bald and Golden Eagle Protection Act. Bald eagles are regularly observed near Ediz Hook and are likely to be present flying over the project area either to forage or when traveling to nesting sites. The bald eagle nesting period is from January 1 through August 31. Two bald eagle nest sites are approximately 3 miles (5 kilometers [km]) west of USCG AIRSTA/SFO Port Angeles (WDFW 2014b).

3.3.2.2 Marine Vegetation

Aquatic vegetation includes intertidal and subtidal species as well as floating and attached species. Macroalgae species such as *Laminaria*, a genus of brown algae commonly referred to as "kelp," are common in the area. Kelp are large brown seaweeds that attach to bedrock or cobbles in high wave energy areas within shallow waters; they are typically found at depths less than 66 feet (20 meters [m]) (Mumford 2007).

Table 3.3-1. Bird Species Observed in the Action Area

Common Name (*Scientific Name*)	*Months Observed*
American wigeon (*Anas americana)*	Jan - Apr, Oct - Nov
Bald eagle (*Haliaeetus leucocephalus*)	Jan - Jul, Oct - Nov
Black-bellied plover (*Pluvialis squatarola)*	January - Apr, Jul - Dec
Brant (*Branta bernicla)*	Jan - Apr
Bufflehead (*Bucephala albeola)*	Jan - Apr, Oct, Nov
California gull (*Larus californicus)*	Year round
Canada goose (*Branta canadensis)*	Year round (rare in Sep)
Common goldeneye (*Bucephala clangula)*	Jan - Apr, Nov - Dec
Common loon (*Gavia immer)*	Jan - May, Aug - Dec
Common merganser (*Mergus merganser)*	Jan - Mar (rare in Jul, Aug, Oct, Dec)
Common murre (*Uria aalge)*	Year round (rare in Jun)
Double-crested cormorant (*Phalacrocorax auritus)*	Year round (rare in May)
European starling (*Sturnus vulgaris*)	Year round
Glaucous-winged gull (*Larus glaucescens)*	Year round
Greater scaup (*Aythya marila)*	Jan - May, Aug, Oct - Dec
Green-winged teal (*Anas crecca*)	Jan - March, May, Oct - Nov
Harlequin duck (*Histrionicus histrionicus)*	Year round
Heermann's gull (*Larus heermanni)*	June - Nov
Horned grebe (*Podiceps auritus)*	Jan - Apr, Sept - Nov
Lesser scaup (*Aythya affinis*)	Jan - Feb, Apr, May, Oct - Dec
Mallard (*Anas platyrhynchos*)	Year round (rare in Jun and Jul)
Northern shoveler (*Anas clypeata*)	Jan - May, Oct - Dec
Pacific wren (*Troglodytes pacificus*)	Feb - Mar, Nov
Pelagic cormorant (*Phalacrocorax pelagicus)*	Year round
Red-breasted merganser (*Mergus serrator)*	Jan - May (rare), Jun - Aug, Sep - Dec
Red-necked grebe (*Podiceps grisegena)*	Jan - May, Aug - Dec
Savannah sparrow (*Passerculus sandwichensis*)	Apr - May, Sep - Oct
Surf scoter (*Melanitta perspicillata)*	Year round (rare in Jun)
Western grebe (*Aechmophorus occidentalis*)	Jan - May, Aug - Dec
Western sandpiper (*Calidris mauri*)	Jan - April, Jul - Oct
White-winged scoter (*Melanitta fusca*)	Jan - Jun, rare in Jul, Oct - Dec
Yellow-rumped warbler (*Dendroica coronata*)	Jan - Mar, Sep - Dec

Sources: Seattle Audubon Society 2014; eBird 2015.

Eelgrass (*Zostera* spp.) creates high-quality aquatic habitat and is most abundant in low-wave energy areas. It occurs in the lower intertidal and shallow subtidal photic zone, where organic matter and nutrients are abundant (Johnson and O'Neil 2001). Eelgrass is found in sediments ranging from mud to clean sand, with its upper limit distribution within the intertidal zone and its lower limit distribution controlled by light limitation in the shallow subtidal zone. The depth of eelgrass presence is typically less than 32 feet (10 m) (Mumford 2007).

Eelgrass and macroalgae surveys were conducted along the south side of Ediz Hook in 1993, 2003, 2012, and 2015 (Shreffler 1993; MCS Environmental 2003; Grette Associates 2012; SEE LLC 2015) (Figure 3.3-1). Video and diver surveys were conducted along the south side of Ediz Hook within the action area in July 2015. The surveys documented eelgrass presence on the west side of the jetty/rock pile, but in relatively small and discontinuous patches. On the east side of the jetty, one dense, contiguous bed of eelgrass was recorded between approximately -1 foot and -20 feet (-0.3 m and -6 m) MLLW. Solitary patches of eelgrass were observed as shallow as -0.5 foot (-0.15 m) MLLW and as deep as -30 feet (-9 m) MLLW. Eelgrass density was measured using turion counts, defined as the number of eelgrass shoots per 0.25 square meter (m^2).

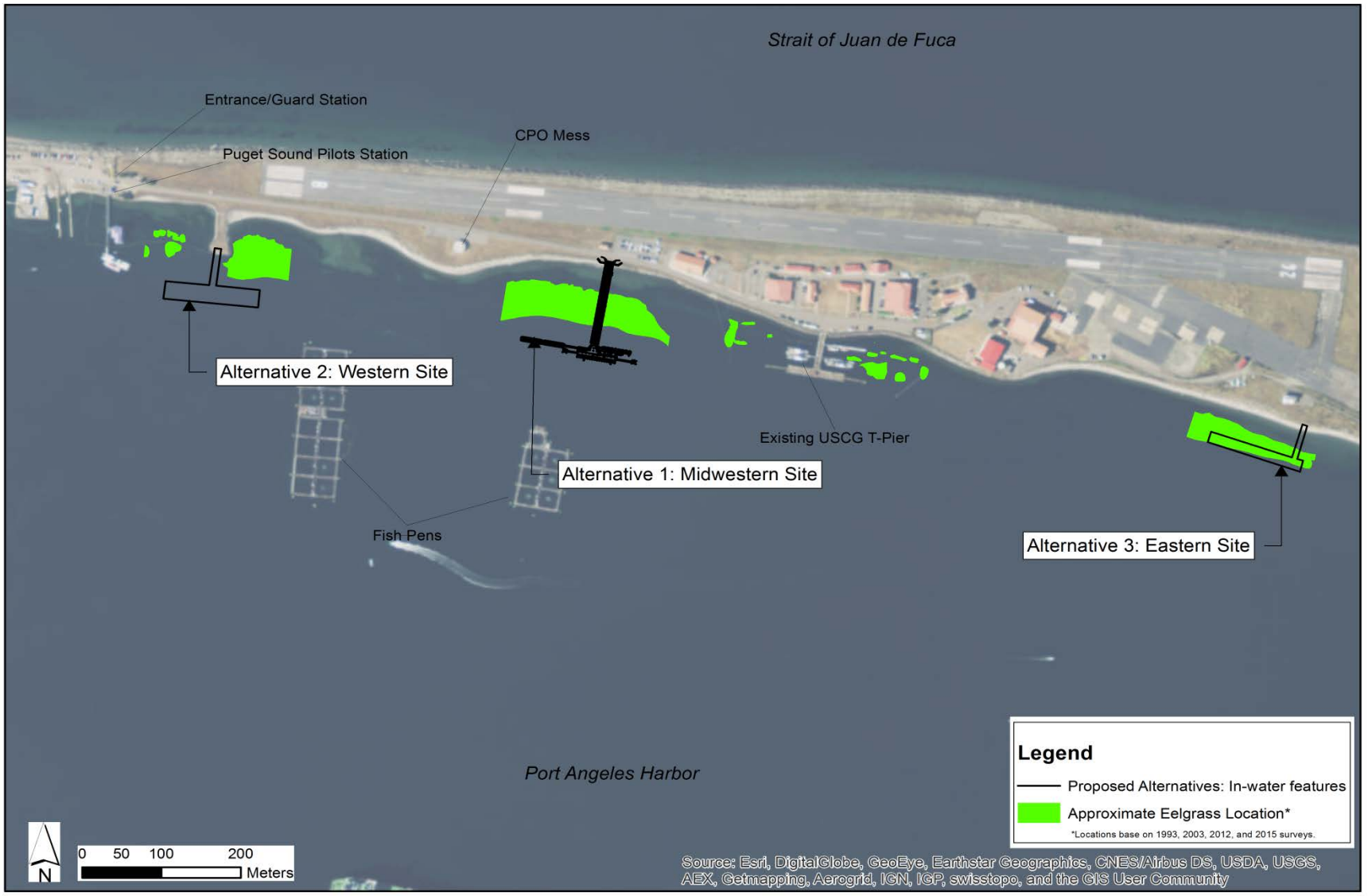

Figure 3.3-1. Eelgrass Presence in the Project Area

(*Sources*: Shreffler 1993; MCS Environmental 2003; Grette Associates 2012; SEE LLC 2015)

Turion counts along the upper intertidal limit of the eelgrass beds were from 13 to 19 per 0.25 m^2 to the west of the jetty, and from 14 to 52 turions on the eastern side of the jetty. The total eelgrass within the surveyed transects of the jetty in 2015 was 49,693 ft^2 (4,616 m^2) (SEE LLC 2015).

Eelgrass surveys along approximately 1,600 feet (488 m) east of the jetty recorded a continuous bed, primarily occurring between 0 and -20 feet (0 and -6 m) MLLW. Individual plants were observed in a video survey down to as deep as -35 feet (-10.7 m) MLLW, but were found at a lower limit of -20 feet (-6 m) MLLW during a diver survey. Turion counts along the upper intertidal limit of the eelgrass beds were 23 to 40 per 0.25 m^2. The average eelgrass density of the area was 18 turion counts per 0.25 m^2. The total eelgrass within the footprint of the project area is 98,873 ft^2 (9,186 m^2) (SEE LLC 2015).

At the east end of Ediz Hook, eelgrass occurs in a relatively narrow bed between approximately -1.5 feet and -19 feet (-0.4 m and -5.8 m) MLLW but becomes limited to approximately -3 feet to -19 feet (-0.9 m to -5.8 m) MLLW at the easternmost surveyed location where the shore becomes steep and dominated by large cobble. Turion counts averaged 30 per 0.25 m^2 quadrat. Total eelgrass at the eastern end of Ediz Hook was 47,909 ft^2 (4,451 m^2) (SEE LLC 2015).

Macroalgae coverage near the existing jetty and eastern end of Ediz Hook was 55 percent and 19 percent, respectively (Grette Associates 2012). Macroalgae was observed in a dense layer throughout both the east and west sides of the existing T-Pier. Algae recorded was predominantly sea lettuce (*Ulva lactuca*) and kelp (*Laminaria* spp.), accounting for 71 percent and 20 percent, respectively. Some red algae (2 percent) was also present (MCS Environment 2003).

During the 2015 survey, macroalgae coverage within the area of the jetty and west primarily consisted of *Ulva, Laminaria*, and *Sarcodiotheca* spp. Macroalgae occurring east of the jetty and extending toward the T-Pier consisted mainly of *Ulva* and *Laminaria* as well as *Sargassum* spp. At the eastern end of Ediz Hook, the main macroalgae species observed were *Laminaria, Nereocystis, Ulva*, and *Sarcodiotheca* spp. (SEE LLC 2015). A summary of macroalgae species observed within the project area is provided in Table 3.3-2.

Table 3.3-2. Summary of Macroalgae Species Observed within the Project Area

Common Name	Scientific Name
Bleachweed	*Prionitis lanceolata*
Brown algae	*Leathesia difformis*
Bull kelp	*Nereocystis* spp.
Callophyllis	*Callophyllis* spp.
Coralline algae	*Corallinaceae* spp.
Gracilaria	*Gracilaria* spp.
Kelp	*Laminaria* spp.
Palmaria	*Palmaria* spp.
Plocamium	*Plocamium* spp.
Red Iridescent algae	*Iridea codata*
Sarcodiotheca	*Sarcodiotheca* spp.
Sargassum	*Sargassum* spp.
Seagrass laver	*Smithora naiadum*
Sea lettuce	*Ulva lactuca*
Seersucker kelp	*Costaria costata*
Splendid iridescent seaweed	*Mazzaella splendens*
Sugar kelp	*Saccharina latissima*

Source: Grette Associates 2012; SEE LLC 2015.

3.3.2.3 Invertebrates

Bottom substrate in the project area is highly varied. Silty sand is predominant, and patches of sand, silt, clay, a sticky sand-clay mixture, shells, gravel, and wood debris are also found (MCS Environmental 2003; Berger Abam 2014). Pandalid shrimp (*Pandalus* spp.), Dungeness crab (*Cancer magister*), and hard shell clam (*Mercenaria mercenaria)* occur south of Ediz Hook and into Port Angeles Harbor (WDFW 2015a).

Surveys in 2003 recorded an abundance of Sitka periwinkle turban snail (*Littorina sitkana*) occurring on *Laminaria* and eelgrass at the existing T-Pier site. Other species observed included leopard dorid nudibranch (*Diaulula sandiegensis*), Monterey sea lemon nudibranch (*Archidoris montereyensis*), slender tube worms (*Phyllochaetopterus prolifica*), slender kelp crab (*Pugettia gracilis*), helmet crab (*Telmessus cheiragonus*), plumrose anemone (*Metridium senile*), painted anemone (*Urticina crassicornis*), leafy hornmouth snail (*Ceratastoma foliatum*), and smooth pink scallop (*Chlamys rubida*) (MCS Environmental 2003). Dive surveys in 2014 along Ediz Hook recorded the presence of crabs and starfish, as well as an abundance of coral attached to existing piles (Berger Abam 2014). Additional surveys within the project area observed approximately 20 different species of invertebrates, including red rock crab (*Cancer productus*), northern kelp crab (*Pugettia producta*), Dungeness crab, spiny pink sea star (*Pisaster brevispinus*), leather sea star (*Dermasterias imbricata*), sunflower sea star (*Pycnopodia helianthoides*); and various species of anemones, shrimp, and jellyfish (Reef.org 2015).

Benthic surveys conducted in 2002-2003 and 2013 as part of the Puget Sound Ecosystem Monitoring Program included samples collected in the Port Angeles Harbor. These studies found that within the inner Port Angeles Harbor, benthic assemblages that appear to be adversely affected by natural and/or human-caused stressors were present (Ecology 2015b).

3.3.2.4 Marine Fish

Over 50 different species of fish have been documented within the nearshore habitat of the project area. Fish species that occur within the project area include various salmonid species (salmon, trout), groundfish, and forage fish. Juvenile and adult salmonids occur in the project area and are described in more detail in Section 3.3.2.5, *Special-Status Species.* Between 2006 and 2014, Fresh (2015) conducted monthly surveys from April to September within the nearshore of the project area. The surveys involved fish collection via a seine set approximately 98 feet (30 m) from shore. With the exception of forage fish, the majority of the species collected were at the juvenile stage. The most common species collected were adult and juvenile surf smelt (*Hypomesus pretiosus*) and Pacific sand lance (*Ammodytes hexapterus*), English sole (*Parophrys vetulus*), pink salmon (*Oncorhynchus gorbuscha*), and juvenile Chinook salmon (*Oncorhynchus tshawytscha*).

Forage fish are an important and abundant group of species that occur in the marine waters of Washington. As the name implies, forage fish are important as prey for a variety of other marine organisms, including birds, fish, and marine mammals. The most common forage fish in Puget Sound include Pacific herring (*Clupea harengus pallasi*), surf smelt, and Pacific sand lance. All three forage fish species occur in Port Angeles Harbor (Shaffer and Galuska 2009; Fresh 2015).

The majority of spawning by herring in Washington State waters occurs annually from late January through early April (Bargmann 1998). Herring deposit their transparent eggs on intertidal and shallow subtidal eelgrass and marine algae. Although no herring spawning locations have been documented along Ediz Hook (WDFW 2015a), juvenile herring have been caught during seining just off Ediz Hook (Shaffer and Galuska 2009).

Surf smelt are most abundant in the Port Angeles Harbor in late spring through summer. Surf smelt are believed to spawn throughout the year, with the heaviest spawn occurring from mid-October through December. Although no surf smelt spawning locations have been documented along Ediz Hook (WDFW 2015a), adult, juvenile, and larval surf smelt may be present year round.

Sand lance spawning activity occurs annually from early November through mid-February. They deposit eggs on a range of nearshore substrates, from soft, pure, fine sand beaches to beaches armored with gravel (Bargmann 1998). Bargmann (1998) indicates that 35 percent of all juvenile salmon diets and 60 percent of the juvenile Chinook diet, in particular, are sand lance. Other regionally important species (such as Pacific cod, Pacific hake, and dogfish) feed heavily on juvenile and adult sand lance. The closest documented sand lance spawning area is a 1,000-foot (305-m) long area on the south side of Ediz Hook approximately 0.6 mile (1 km) west of USCG AIRSTA/SFO Port Angeles (WDFW 2015a) (Figure 3.3-2). Adult, juvenile, and larval sand lance are expected to be present within Port Angeles Harbor throughout the year.

Based on recreational dive surveys over the last 5 years within the project area and vicinity from the jetty/rock pile out to depths of 135 feet (40 m), the most common species observed were copper rockfish (*Sebastes caurinus*), kelp greenling (*Hexagrammos decagrammus*), black rockfish (*Sebastes melanops*), great sculpin (*Myoxocephalus polyacanthocephalus*), and blackeye goby (*Rhinogobiops nicholsii*) (Reef.Org 2015).

3.3.2.5 Special-Status Species

Special-status species include ESA-listed species and associated critical habitat and marine mammals.

ESA-Listed Species and Critical Habitat

Nine ESA-listed species either occur or have the potential to occur in the action area. These species include two Evolutionarily Significant Units (ESUs) and four Distinct Population Segments (DPSs) for six fish species, two marine mammal species (including one DPS), and one bird species. The ESA listing status and presence of critical habitat (if designated) in the action area are provided in Table 3.3-3. Additional information regarding the distribution and likely presence of these species is described in the following sections.

Puget Sound Chinook Salmon ESU

The Puget Sound Chinook salmon ESU (hereafter PS Chinook ESU) was listed as threatened under the ESA in June 2005 (NMFS 2005a). The listing includes all naturally spawned populations of Chinook salmon from rivers and streams flowing into Puget Sound, including the Strait of Juan de Fuca from the Elwha River, eastward, including rivers and streams flowing into Hood Canal, South Sound, North Sound, and the Strait of Georgia in Washington, as well as 26 artificial propagation programs.

Critical Habitat

Critical habitat was designated for the PS Chinook ESU in September 2005 (NMFS 2005b). Critical habitat consists of water, substrate, and the adjacent riparian zone of accessible estuarine and riverine reaches. In marine areas, critical habitat includes all nearshore marine areas (including areas adjacent to islands) of the Strait of Georgia (south of the Canada-US border), Puget Sound, Hood Canal, and the Strait of Juan de Fuca (to the western end of the Elwha River delta) from the line of extreme high tide out to a depth of 98 feet (30 m). Critical habitat for PS Chinook ESU occurs within Port Angeles Harbor, along Ediz Hook and extending north, south, and east to -98 feet (-30 m) MLLW (Figure 3.3-3).

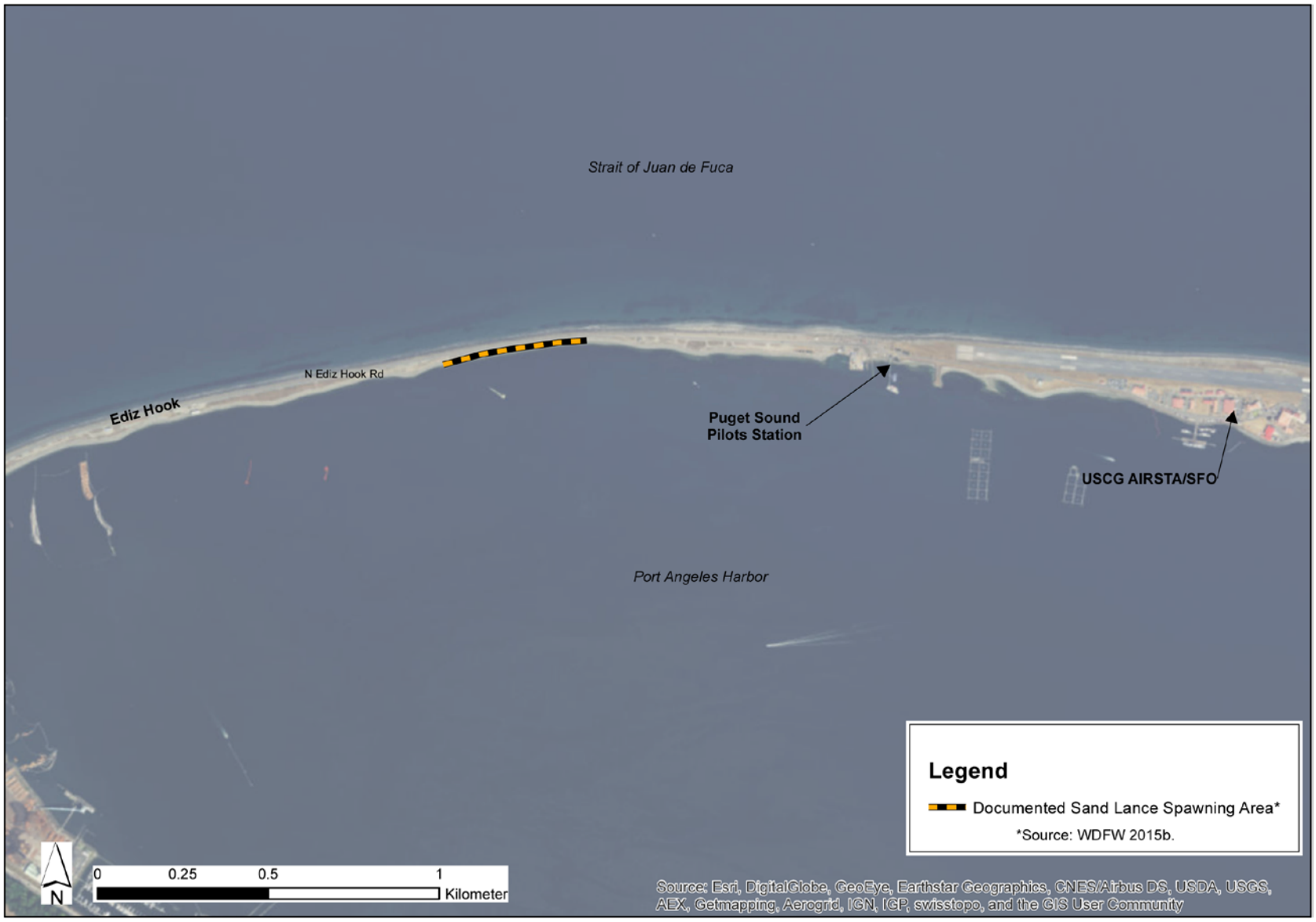

Figure 3.3-2. Pacific Sand Lance Spawning Area within the Vicinity of the Project Area

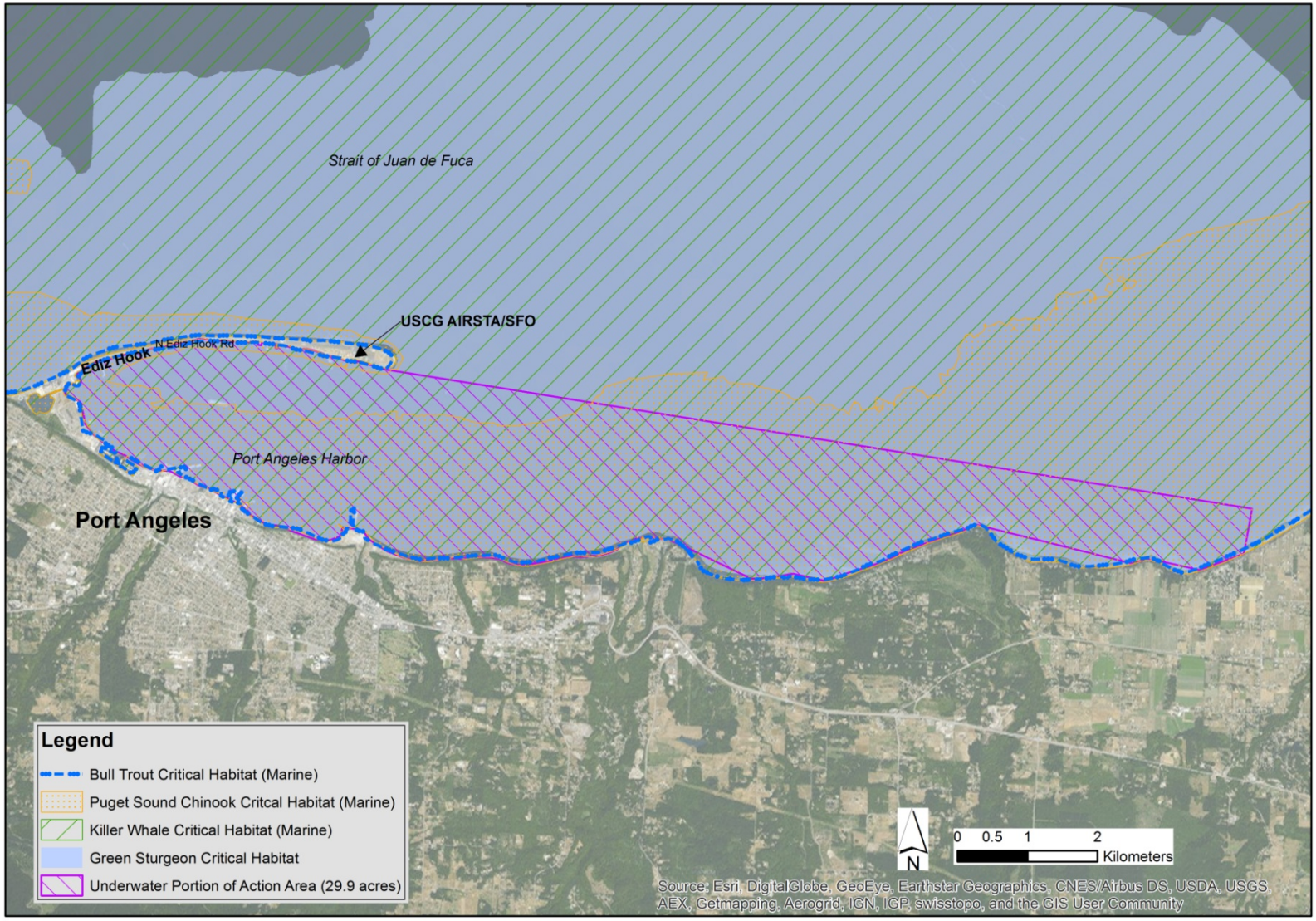

Figure 3.3-3. Designated Critical Habitat for Bull Trout, Puget Sound Chinook Salmon ESU, Southern Resident Killer Whale DPS, and Green Sturgeon Southern DPS

(*Sources*: NMFS 2005b, 2006b, 2009a; USFWS 2010a)

Table 3.3-3. ESA-listed Species and Critical Habitat Present within the Action Area

Common name (*Scientific name)*	ESA Status	Designated Critical Habitat within or in Vicinity of the Project Area
NMFS-Regulated Species		
Puget Sound Chinook Salmon ESU (*Oncorhynchus tshawytscha*)	T	Yes – along the shoreline from a line of extreme high tide out to a depth of 98 feet (30 m).
Hood Canal Summer-Run Chum Salmon ESU (*Oncorhynchus keta*)	T	No.
Puget Sound Steelhead DPS (*Oncorhynchus mykiss*)	T	No.
Pacific Eulachon Southern DPS (*Thaleichthys pacificus*)	T	No.
North American Green Sturgeon Southern DPS (*Acipenser medirostris*)	T	Yes – within Port Angeles Harbor and on the north side of Ediz Hook in Strait of Juan de Fuca out to 360 feet (110 m) or within 100 miles (161 km) of shore.
Southern Resident Killer Whale DPS (*Orcinus orca*)	E	Yes – within Port Angeles Harbor and the Strait of Juan de Fuca in waters deeper than 20 feet (6 m).
Humpback Whale (*Megaptera novaeangliae*) Western North Pacific DPS Central America DPS	E PT PT	No.
USFWS-Regulated Species		
Bull Trout (*Salvelinus confluentus*)	T	Yes – within Port Angeles Harbor and nearshore marine areas of the Strait of Juan de Fuca out to a depth of 33 feet (10 m).
Marbled Murrelet (*Brachyramphus marmoratus*)	T	No.

Notes: E = endangered; PT = proposed threatened; T = threatened.
Sources: USFWS 1970, 1992, 1999, 2010a; NMFS 2005a, 2005b, 2005c, 2006a, 2006b, 2007, 2008, 2009a, 2010a, 2015.

Six Primary Constituent Elements (PCEs) were identified in the designation (NMFS 2005b). These include:

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;

(2) Freshwater rearing sites with (i) water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility; (ii) water quality and forage supporting juvenile development; and (iii) natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks;

(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;

(4) Estuarine areas free of obstruction and excessive predation with: (i) water quality and quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater; (ii) natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders side channels; and (iii)

juvenile and adult forage, including aquatic invertebrates and fishes, supporting grown and maturation;

(5) Nearshore marine areas free of obstruction and excessive predation with: (i) water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and (ii) natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels; and

(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.

Only PCEs 5 and 6 occur in the action area.

Occurrence in the Action Area

The Strait of Juan de Fuca contains two of the 22 independent populations that the Puget Sound Technical Recovery Team (PSTRT) identified within the PS Chinook ESU (Ruckelshaus et al. 2006). The independent populations in the Strait of Juan de Fuca are the Dungeness River population and the Elwha River population. Figure 3.3-4 shows the location of these rivers in reference to the project area.

The Elwha River population is believed to be comprised of two subpopulations: an early and a late returning run. Chinook return to the Elwha River from late spring through late-September and spawn from late-August through mid-October (Puget Sound Indian Tribes and WDFW 2004). Schools of Chinook fry congregate in nearshore areas prior to their offshore migration to feed in open water (Nightingale and Simenstad 2001). Smaller outmigrants tend to migrate along nearshore areas and use river deltas and pocket estuaries as rearing areas (Beamer et al. 2003). Larger outmigrants are not as associated with the nearshore. Chinook salmon have been observed utilizing the upper Elwha River since dam removal was completed in 2014. Chinook had not had access to the upper Elwha River in over 100 years (Leach 2014).

The Dungeness River population is comprised of a single population of native origin fish with spring/summer run timing. Chinook return to the Dungeness River in the late spring to mid-summer, with spawning occurring in early August through early October. Fry emerge in the early spring, with a majority emigrating to rear in the estuary during their first year of life, while remaining fry will rear in the river for a year and emigrate out as yearlings. Fish spend the first year of their life within estuarine nearshore habitat (Puget Sound Indian Tribes and WDFW 2004).

Both the Elwha and Dungeness populations likely occur in the project area. During nearshore surveys conducted from 2006 through 2014, juvenile Chinook salmon were recorded from April to September. Out of approximately 40 species collected during these surveys, Chinook were among the most abundant species collected (Fresh 2015).

Hood Canal Summer-Run Chum Salmon ESU

The Hood Canal summer-run chum salmon ESU (hereafter HC chum ESU) was listed as threatened in June 2005 (NMFS 2005a). The listing includes all naturally spawned populations of summer-run chum salmon in Hood Canal and its tributaries, as well as populations in Olympic Peninsula rivers between Hood Canal and Dungeness Bay, Washington. Eight artificial propagation programs are also considered to be part of this ESU.

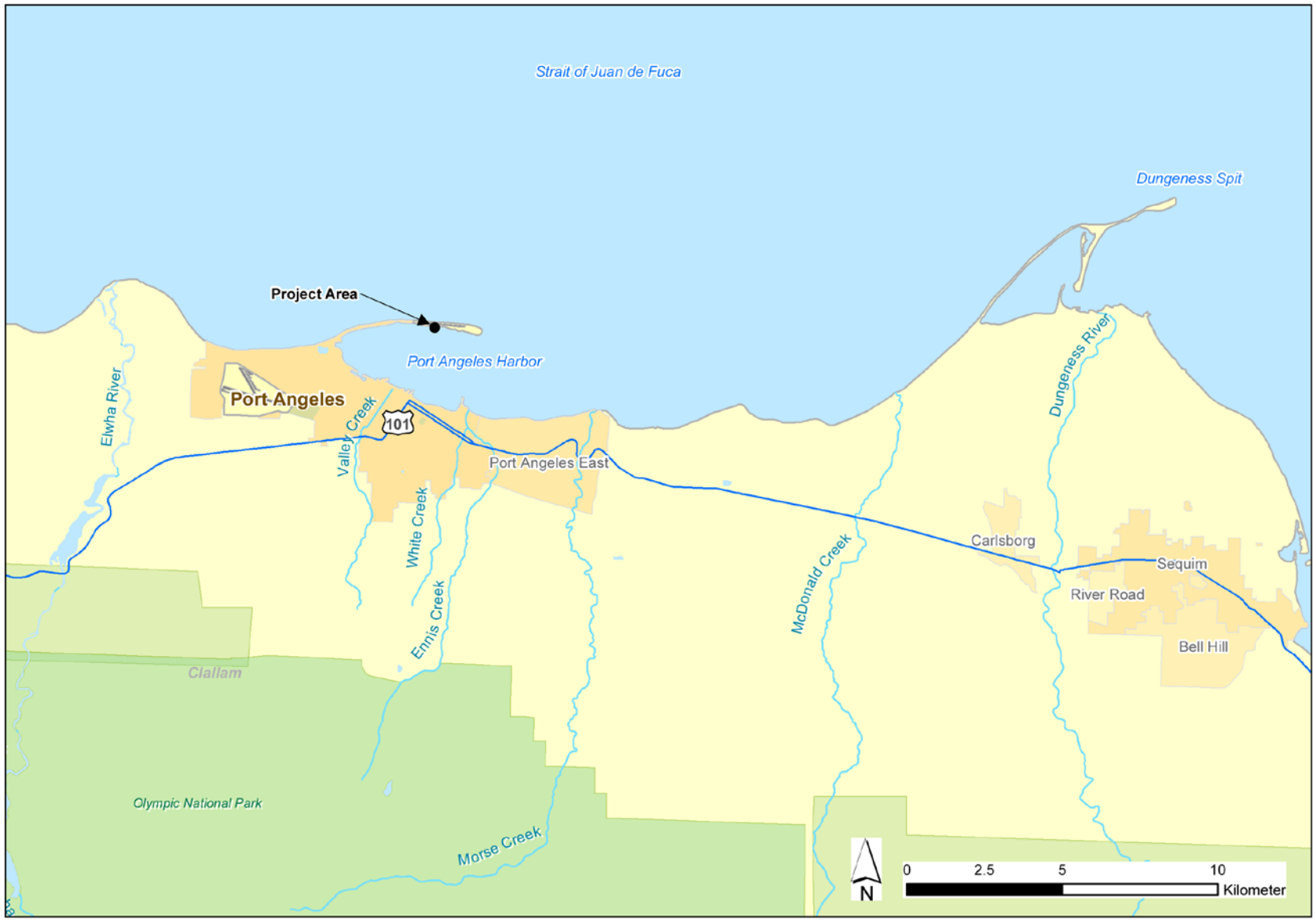

Figure 3.3-4. Surface Waters in the Vicinity of the Project Area

Critical Habitat

Critical habitat is designated for the HC chum ESU (NMFS 2005b), but it does not overlap or fall within the action area.

Occurrence in the Action Area

The PSTRT designated two independent populations of HC chum ESU: one that includes spawning aggregations in Hood Canal and one that includes the spawning aggregations from rivers and creeks draining into the Strait of Juan de Fuca (Ford 2011). The Strait of Juan de Fuca summer chum population is composed of five spawning aggregations (Dungeness River, Jimmycomelately Creek, Salmon Creek, Snow Creek, and Chimacum Creek). Summer chum enter the Dungeness River in late August through late October and spawn in the main channel through September. Some spawn in the tributaries of the river within low gradient, low mainstem reaches where low flows are encountered in late summer and early fall. Eggs incubate in redds for 5 to 6 months, with fry emerging between January and May. After hatching, fry migrate rapidly downstream and out to the estuary and nearshore areas (National Oceanic and Atmospheric Administration [NOAA] Fisheries 2005). During nearshore surveys conducted from 2006 through 2014, juvenile chum salmon were recorded from April through September, with higher abundances during the spring months (April through June) (Fresh 2015). HC chum ESU likely occur in the action area.

Puget Sound Steelhead DPS

The Puget Sound steelhead DPS (hereafter PS steelhead DPS) was listed as threatened under the ESA in 2007 (NMFS 2007). The PS steelhead DPS includes all naturally spawned anadromous steelhead originating below natural and manmade impassable barriers from rivers flowing into Puget Sound from the Elwha River eastward, including rivers in Hood Canal, South Sound, North Sound, and the Strait of Georgia. Steelhead from six artificial propagation programs are also included.

Critical Habitat

Critical habitat for the PS steelhead DPS was proposed in January 2013 (NMFS 2013a) but does not overlap with the action area.

Occurrence in the Action Area

The PS steelhead DPS exhibits two distinct life history strategies: summer- and winter-run migrations. Winter-run steelhead are ocean-maturing fish, returning to freshwater to spawn during the winter and early spring-months and relatively soon after entering freshwater. Summer-run steelhead are stream-maturing fish that return to freshwater during the late spring at an immature state, where they remain in freshwater to continue maturing, and spawn the following winter or spring. Winter-run steelhead are the predominant life history type that occurs in Puget Sound (Puget Sound Steelhead Technical Recovery Team [PSSTRT] 2013).

Of the 32 independent populations of the PS steelhead DPS, 3 may occur in the vicinity of the action area. These include the Dungeness River summer/winter run, Strait of Juan de Fuca Independent Tributaries winter run, and the Elwha River winter run (PSSTRT 2013).

The Dungeness River summer/winter-run population spawns in the mainstem of the Dungeness and Grey Wolf rivers. Given that historical records indicate the presence of summer-run steelhead in the 1940s, further monitoring is needed to determine if they are still present in the basin. Within the Dungeness River, spawning occurs from mid-March to early June. Genetically, the Dungeness River steelhead most closely cluster with other collections from the Strait of Juan de Fuca and Elwha River populations (PSSTRT 2013).

The Strait of Juan de Fuca Independent tributaries winter-run steelhead population consists of steelhead spawning in small independent tributaries of the Strait of Juan de Fuca between the Dungeness and Elwha rivers, including Ennis, White, Morse, Siebert, and McDonald creeks (Figure 3.3-4) (PSSTRT 2013).

The Elwha River winter-run steelhead population consists of a native late-winter run and one early-winter hatchery-origin run. Natural spawning occurs in the mainstem and tributaries in mid-March for early returning steelhead, and from April to June for late returning steelhead (PSSTRT 2013).

Although Shaffer and Galuska (2009) recorded presence of steelhead during the summer, occurrence was identified as rare as only one fish was identified. Fresh (2015) did not record any presence of steelhead during spring and summer months of 2006 through 2014; sampling data are not available for the other months.

Pacific Eulachon Southern DPS

The Pacific eulachon southern DPS (hereafter southern eulachon DPS) was listed as threatened under the ESA in March 2010 (NMFS 2010a). This DPS includes all eulachon originating from the Skeena River in British Columbia south to and including the Mad River in northern California.

Critical Habitat

Critical habitat has been designated for the southern eulachon DPS (NMFS 2011) but does not overlap with the action area.

Occurrence in the Action Area

Eulachon inhabit the nearshore ocean waters to a depth of 1,000 feet (300 m). They spend 3 to 5 years in saltwater before returning to freshwater to spawn. Eulachon spawn in lower reaches of larger snowmelt-fed rivers in water temperatures between 39 and 50°F. Spawning occurs over sand or coarse gravel substrates and most adults die after spawning. Eggs are fertilized in the water column and sink following fertilization, then adhere to the river bottom. Eggs hatch in 20 to 40 days, and larvae are then carried downstream and disperse on estuarine and ocean currents. Juvenile eulachon move from shallow nearshore areas to mid-depth areas, and both juveniles and adults commonly forage within depths ranging from 66 to 292 feet (20 to 150 m) (NMFS 2014).

Prior to dam removal, eulachon were rare in the Elwha River system for the past 60 years and only occasional spawning had been reported (Gustafson et al. 2010). Removal of the dam has restored eulachon habitat that was altered by the dams. In January 2015, seining surveys in the lower Elwha River estuary collected hundreds of egg-bearing and spent eulachon, indicating that local spawning was occurring (Coastal Watershed Institute 2015).

Larvae and young juveniles become widely distributed in coastal waters once they enter the ocean. Larvae, measuring 1 to 1.1 inches (25 to 30 millimeters), have been caught via incidental plankton net catch in the Strait of Juan de Fuca on the north side of Ediz Hook (Fisheries and Oceans Canada 2014).

North American Green Sturgeon Southern DPS

The North American green sturgeon southern DPS (hereafter southern green sturgeon DPS) was listed under the ESA as threatened in April 2006 (NMFS 2006a). This DPS includes all green sturgeon originating from the Sacramento River basin and from coastal rivers south of the Eel River in northern California.

Critical Habitat

Critical habitat for the southern green sturgeon DPS was designated in October 2009 and includes the marine waters within the 360-foot (110-m) depth isobaths from Monterey Bay to the U.S.-Canada border, including Port Angeles Harbor (NMFS 2009a) (Figure 3.3-3).

Three PCEs were identified that are essential for conserving the southern green sturgeon DPS in coastal marine areas (NMFS 2009a). These include:

(1) Migratory Corridor – a safe and timely migratory pathway within marine and between estuarine and marine habitats. Safe and timely passage is achieved when human-induced impediments (physical, chemical, or biological) do not alter migratory behavior of the fish.

(2) Water Quality – Coastal marine waters with adequate dissolved oxygen levels and acceptably low levels of contaminants.

(3) Food Resources – abundant prey items for subadults and adults, which may include benthic invertebrates and fish.

Of the three PCEs described above, PCEs 2 and 3 occur in the action area.

Occurrence in the Action Area

Green sturgeon are the most wide-ranging and most marine-oriented species of the sturgeon family and are believed to spend a majority of their lives in nearshore oceanic waters, bays, and estuaries. Spawning occurs from March through July in the mainstem of the Sacramento River, California. Juveniles rear in the Sacramento River and the Delta and bays for 1 to 4 years before migrating out to sea as subadults. While at sea, green sturgeon inhabit coastal bays and estuaries and coastal marine waters from the Bering Sea to southern California, primarily occurring within depths of 360 feet (110 m) (NMFS 2010b).

Subadult and adult green sturgeon make annual migrations along the coast in the spring and fall, spending winters in the marine waters north of Vancouver Island and south of southeast Alaska, and summers in coastal waters, bays, and estuaries of Washington, Oregon, and California. Sturgeon have been observed on a southward migration within the Strait of Juan de Fuca waters during summer. It is assumed that most green sturgeon migrating between Canadian and U.S. waters cross the Strait of Juan de Fuca over deep water to the west of the Strait of Juan de Fuca line (Lindley et al. 2008). There have been no sightings of green sturgeon within Port Angeles Harbor (Longenbaugh 2015).

Southern Resident Killer Whale DPS

The Southern Resident killer whale DPS (hereafter SRKW DPS) was listed under the ESA as endangered in November 2005 (NMFS 2005c). This DPS is comprised of three pods, designated as J, K, and L pods. The SRKW DPS is one of three forms, or ecotypes (Resident, Transient, and Offshore) occurring in the Eastern North Pacific region (NMFS 2005c).

Critical Habitat

Critical habitat was designated for the SRKW DPS in November 2006 (NMFS 2006b). This designation includes 2,560 square miles (6,630 square kilometers [km^2]) of marine waters deeper than 20 feet (6 m) within three areas: (1) Summer Core Area in Haro Strait and waters around the San Juan Islands; (2) Puget Sound; and (3) the Strait of Juan de Fuca, including Port Angeles Harbor (Figure 3.3-3).

Three PCEs were identified that are essential for conserving SRKW DPS (NMFS 2006b). These include:

(1) Water quality to support growth and development;

(2) Prey species of sufficient quantity, quality, and availability to support individual growth, reproduction, and development, as well as overall population growth; and

(3) Passage conditions to allow for migration, resting, and foraging.

All three PCEs described above occur in the action area.

Occurrence in the Action Area

Prior to the 1960s, the SRKW DPS was estimated to be approximately 140 whales. Approximately 50 whales were removed during the live-capture fishery in the 1960s before it ended in the mid-1970s when there was an estimated total wild population of 71 whales. By 1995, the population peaked at 98 animals and then dropped by 20 percent between 1996 and 2001 (NMFS 2014a). This drop in population is what ultimately resulted in the endangered listing status under ESA in 2005.

As of the summer of 2014, the population was estimated at 79 individuals (Center for Whale Research 2014). In December 2014, the carcass of a 19-year old pregnant female member of J pod was found along a shoreline in British Columbia (Balcomb 2014). After reviewing sighting summaries that include the addition of one calf in 2014 and three calves in 2015, the current population is estimated at approximately 81 whales in July 2015 (Seattle Times 2015).

The SRKW DPS is found during the spring, summer, and fall months in the Salish Sea, which includes the inland waters of Puget Sound, the Northwest Straits, and the southern Georgia Strait. Between 1976 and 2014, SRKW were observed within the areas of the Strait of Juan de Fuca, passing by Ediz Hook during the summer months of June through September, with peak occurrence in spring (March). SRKW have not been sighted during the month of February and are generally less common during the winter months (The Whale Museum 2015). Their coastal distribution during the winter is not completely confirmed, but the population has been observed south in Monterey Bay, California and north in Chatham Strait in southeast Alaska (NMFS 2014a).

Humpback Whale

Humpback whales were listed in 1970 as endangered under the Endangered Species Conservation Act of 1969 (USFWS 1970), the predecessor to the ESA. When the ESA was passed in 1973, the humpback whale was listed as endangered throughout its range. In April 2015, NMFS proposed to divide the globally listed endangered humpback whale species into 14 DPSs, remove the current species-level listing, and in its place list 2 DPSs as endangered and 2 DPSs as threatened. The remaining 10 DPSs are not proposed for listing based on their current statuses (NMFS 2015). Based on the fidelity of humpback whales to feeding grounds, two of the DPSs proposed for threatened status (Western North Pacific and Central America) are known to use the Eastern North Pacific waters of Alaska, British Columbia, and Washington for feeding. Two additional DPSs that are not proposed for listing (Hawaii and Mexico) are also known to use Eastern North Pacific waters for feeding (NMFS 2015).

Critical Habitat

Critical habitat has not been designated for humpback whale.

Occurrence within the Action Area

The primary threats to humpback whales are entanglement in fishing gear, ship strikes, whale watch harassment, harvest, and habitat impacts. Entanglement in gear from several fisheries can occur along their long migration from Hawaii to Alaska. Longline gear, crab pots, and other

non-fishery related lines have impacted the species. The population was estimated at 1,400 whales in 1966. Shipping traffic, or low- and mid-frequency active sonar have had a potential impact on humpback whale habitat. Studies have not been conducted on humpback whales, but data collected on blue whales (*Balaenoptera musculus*) showed signs of disturbance by way of increasing swimming speed, moving away from the source, and cessation of feeding (Carretta et al. 2014).

The number of humpback whales potentially present within the action area is expected to be low. The closest and most recent sightings of humpback whales to the action area have been within the deep waters of the Strait of Juan de Fuca, approximately 20 miles (32 km) north of the Ediz Hook during the month of May (Orca Network 2015).

Bull Trout

Bull trout was listed under the ESA as threatened in 1999 (USFWS 1999).

Critical Habitat

Critical habitat was originally designated for bull trout in September 2005 (USFWS 2005), with a revision to the designation published in October 2010 (USFWS 2010a). The Olympic Peninsula critical habitat unit is bordered by Hood Canal to the east, Strait of Juan de Fuca to the north, the Pacific Ocean to the west, and the lower Columbia River basins and Puget Sound to the south. In the marine nearshore areas of the action area, the inshore extent of critical habitat is the MHHW line, including the uppermost reach of the saltwater wedge within tidally influenced, freshwater heads of estuaries. Critical habitat extends offshore to the depth of 33 feet (10 m) relative to the MLLW line (USFWS 2010a) (Figure 3.3-3).

Of the nine PCEs identified as essential for conserving bull trout, five PCEs occur in marine waters (USFWS, 2010a). These include:

(1) Migratory habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including, but not limited to permanent, partial, intermittent or seasonal barriers.

(2) An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

(3) Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and substrates, to provide a variety of depths, gradients, velocities, and structure.

(4) Water temperatures ranging from 36 to 59 °F, with adequate thermal refugia available for temperatures at the upper end of this range. Specific temperatures within this range will vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.

(5) Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

Occurrence in the Action Area

The Olympic Peninsula Management Unit includes all watersheds within the Olympic Peninsula and the nearshore marine waters of the Pacific Ocean, Strait of Juan de Fuca, and Hood Canal (USFWS 2010a). The Dungeness River and Elwha River core areas occur within the vicinity of the action area. The Dungeness River core area is expected to support as many as 500 but fewer than 1,000 adult bull trout. In the Elwha River core area, moderately low numbers of bull

trout have been observed. Snorkel surveys in 2003 documented 31 bull trout. There is no information on trends in abundance of the Elwha River bull trout, and the status of this core area is unknown (USFWS 2008).

Bull trout exhibit both resident and migratory life-history patterns. Resident forms complete their entire life cycle in the tributary or nearby stream. Migratory forms spawn in tributary streams, where juvenile fish rear for 1 to 4 years before migrating to either a lake (adfluvial), river (fluvial), or coastal areas to saltwater (anadromous). Bull trout typically spawn from August to November during periods of decreasing water temperatures. Migratory bull trout may begin spawning in April, and move upstream as far as 155 miles (250 km) into spawning grounds in some areas of their range. Temperatures during spawning are typically from 39 to 50°F (USFWS 1999).

The Dungeness River and Elwha River core areas' spawning populations are the only core areas connected to the Strait of Juan de Fuca. Bull trout distribution is patchy, and hence precise population estimate information is unavailable. Spawning does occur in the mainstem Dungeness River (USFWS 2008). The Strait of Juan de Fuca and associated independent tributaries are used for foraging, migration, and overwintering. Bull trout have been documented in the Strait of Juan de Fuca drainages of Bell, Siebert, Morse, and Ennis creeks. However, current and historical habitat conditions of these creeks are not believed to support spawning populations of bull trout (USFWS 2004).

The Elwha River and Dungeness bull trout populations represent 4 of the 11 local populations of the Olympic Peninsula region of the Coastal Recovery Unit identified in the recent revised recovery plan (USFWS 2014a). These populations exhibit fluvial and adfluvial life history strategies and may be anadromous, as a bull trout was captured at the mouth of the river in 2010 (Crain and Brenkman 2010). Spawning in the Elwha River system occurs in October.

Bull trout are not expected within the nearshore areas of the harbor. Surveys conducted by Shaffer and Galuska (2009) and Fresh (2015) did not record any presence of bull trout during spring and summer months of 2006 through 2014; sampling data are not available for the other months. WDFW (2015b) documents bull trout occurrence within Ennis Creek and they may be present and foraging occasionally within the harbor during migration to and from the Strait of Juan de Fuca.

Marbled Murrelet

The Washington, Oregon, and California DPS of marbled murrelet was federally listed as threatened in October 1992 (USFWS 1992).

Critical Habitat

Critical habitat for nesting marbled murrelets was designated in May 1996 (USFWS 1996) and was revised in Oregon and California in 2011 (USFWS 2011). Designated critical habitat in Washington remained unchanged from the 1996 ruling and does not overlap with the action area.

Occurrence in the Action Area

The breeding population in Washington State was determined to be approximately 5,000 birds in 1992. Loss or modification of nesting habitat from commercial timber harvests, human-induced fires, land use changes, and mortality associated with net fisheries and oil spills have been the primary cause of decline. The geographical area of suitable marbled murrelet nesting habitat (old-growth and mature forests) was drastically reduced during the 1800s and 1900s due to timber harvest. The establishment of Olympic National Park was significant for preserving old-growth forest habitat on the Olympic Peninsula that may have otherwise been heavily harvested (USFWS 1997).

A 1997 recovery plan for the marbled murrelet focuses on: (1) establishing conservation zones; (2) identifying and protecting terrestrial and marine habitat areas within each marbled murrelet conservation zone; (3) monitoring nesting and breeding habitat; (4) implementing short-term actions to stabilize the populations; (5) implementing long-term actions to stop the decline and increase populations; (6) initiating research on survey and monitoring protocols; and (7) establishing a Regional West Coast Data Center (USFWS 1997). A five-year review (USFWS 2009) determined that the recovery objectives and delisting criteria have not been met. However, the recovery actions, with the exception of establishing Regional Coordination body, have been implemented. Specifically, six marbled murrelet conservation zones identified within the recovery plan were established, and at-sea marbled murrelet monitoring surveys were developed and have been implemented.

In addition to meeting the requirements of the ESA, long-term marbled murrelet monitoring was designed to evaluate the effectiveness of the Northwest Forest Plan, which encompasses 24 million acres of federal lands. Management objectives of the Northwest Forest Plan focus on protecting and enhancing habitat for mature and old-growth forests and related species, including the marbled murrelet. Five of the six conservation zones established fall within the scope of the Northwest Forest Plan. Annual monitoring has been conducted within these zones since 2000 as part of the Northwest Forest Plan Interagency Monitoring Program (Pearson et al. 2014). The density of marbled murrelets for all conservation zones combined was 22,200 birds in 2001 and 19,600 in 2013 (Pearson et al. 2014). For the combined five-conservation zone area for the monitoring years of 2001 through 2013, a weak downward trend of 1.2 percent decline per year occurred (Falxa et al. 2014).

There is no suitable nesting habitat for marbled murrelets in the action area. However, they use the marine environment of the Strait of Juan de Fuca for courtship, loafing, and foraging and may occur in the offshore areas of the action area. In the Strait of Juan de Fuca and Puget Sound, their nesting season is between April 1 and September 23 (USFWS 2012). During the breeding season, murrelets tend to forage in well-defined areas along the shoreline in relatively shallow marine waters (usually within 1.2 miles [2 km] of shore and in water less than 164 to 328 feet [50 to 100 m] deep) (USFWS 1997). Throughout their range, marbled murrelets are opportunistic feeders and utilize prey of diverse sizes and species but feed primarily on small fish such as Pacific sand lance and smelt species, as well as on various invertebrates in coastal and nearshore marine waters. Murrelets forage at all times of the day and in some cases at night (Strachan et al. 1995; USFWS 2010b). Murrelets typically forage in pairs during the summer, with singles and flocks of three or more birds occurring less often (Strachan et al. 1995; Merizon et al. 1997). During the pre-basic (post-breeding season) molt, murrelets are essentially flightless and must select foraging sites that provide adequate prey resources within swimming distance (Carter 1984; Carter and Stein 1995). During the non-breeding season, murrelets typically disperse and are found farther from shore (Strachan et al. 1995).

The Strait of Juan de Fuca, Puget Sound, Hood Canal, and the San Juan Islands encompass Conservation Zone 1, which overlaps the action area. Surveys conducted May 15 through July 31, 2013 estimated a population of approximately 4,395 birds (Pearson et al. 2014). Surveys conducted during the same sampling window and zone in 2014 showed a decline of 35 percent from the previous year, with 2,822 birds estimated for Zone 1 (Lance and Pearson 2015).

Marine Mammals

Marine mammals are separated into two groups: cetaceans (whales, porpoises, and dolphins) and pinnipeds (sea lions and seals). This is important to the analysis because these two marine mammal groups have different sound thresholds, hearing, and vocalization ranges (NOAA 2013), and perceive and react to sound generated from construction activities (e.g., pile driving) differently. A summary of distribution and occurrence of each of these marine mammal species

within the project area is provided below. A detailed description of the status, abundance, and hearing and vocalization ranges for each marine mammal species and group is provided in a separate Incidental Harassment Authorization Application that was prepared by the Navy (Navy 2016).

Ten non-ESA listed marine mammal species occur in the Strait of Juan de Fuca and have a reasonable potential to occur within the project area. A "reasonable potential" of occurrence is defined as having any regular occurrence in the Strait of Juan de Fuca since 1995. These species include minke whale (*Balaenoptera acutorostrata*), gray whale (*Eschrichitius robustus*), killer whale (West Coast transient DPS), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), Steller sea lion (*Eumetopias jabatus*), California sea lion (*Zalophus californianus*), northern elephant seal (*Mirounga angustirostris*), and harbor seal (*Phoca vitulina*).

Although the minke whale, gray whale, West Coast transient killer whale, Dall's porpoise, and Pacific white-sided dolphin occur in the Strait of Juan de Fuca, these marine mammals would be an extremely rare occurrence in Port Angeles Harbor. Characteristics of Port Angeles Harbor that inhibit or deter use by these marine mammals include the semi-enclosed embayment with no through access and high volume of vessel traffic that include tankers, dry bulk cargo carriers, barges, tugs, fishing boats, leisure craft, Puget Sound Pilots craft, and ferry service, as well as USCG and Navy vessels. The relatively smaller sized Dall's porpoise and Pacific white-sided dolphin prefer deep, offshore waters not present in the harbor. In addition, the larger whales are highly visible and more likely to be detected outside of the monitoring zones by marine mammal observers (protected species observers [PSOs]); therefore, exposure would be avoided and behavioral harassment would not occur. The smaller Dall's porpoise and Pacific white-sided dolphin are considered offshore, deepwater species and would likely avoid the embayment of Port Angeles Harbor. These species also exhibit fidelity to foraging areas, and there are no know foraging areas in Port Angeles Harbor.

Therefore, only the following non-ESA listed marine mammal species have a reasonable potential to occur in the Port Angeles Harbor and the action area and are described in detail below: harbor porpoise, Steller sea lion, California sea lion, northern elephant seal, and harbor seal.

Harbor Porpoise

In the eastern North Pacific Ocean, harbor porpoise are found in coastal and inland waters from Point Barrow, along the Alaskan coast, and down the west coast of North America to Point Conception, California. Two harbor porpoise stocks occur in Oregon and Washington waters. These include an Oregon/Washington Coast stock (between Cape Blanco, Oregon and Cape Flattery, Washington) and the Washington Inland Waters stock (in waters east of Cape Flattery). Only individuals from the Washington Inland Waters stock are expected to occur in the project area. Harbor Porpoise are generally found in cool temperature to subarctic waters over the continental shelf in both the North Atlantic and North Pacific. This species is seldom found in waters warmer than 63°F (17°C). Harbor porpoises can be found year round primarily in the coastal shallow waters of harbors, bays, and river mouths (Carretta et al. 2014).

Harbor porpoise are typically observed in small groups of two to five animals and are one of the most frequently sighted cetaceans in the Salish Sea (Pacific Biodiversity Institute et al. 2013). Harbor porpoise can be opportunistic foragers but primarily feed on schooling forage fish including on Pacific herring, market squid (*Loligo opalescens*), and smelt (Carretta et al. 2014). The closest recent sighting of harbor porpoises near the project area was in April 2015 near Discovery Island, approximately 21 miles (35 km) across the Strait (Orca Network 2016).

Harbor porpoises could forage within Port Angeles Harbor, following local prey availability; however, because of the strong site fidelity and lack of sightings in the harbor, use of the project area would be rare.

Steller Sea Lion

The eastern Steller sea lion DPS was delisted in 2013 after 23 years of threatened status under the ESA (NMFS 2013b). The eastern DPS is distributed east of 144° west longitude and includes southeast Alaska, Canada, Washington (including inland waters), Oregon, and California (NMFS 1997).

In Washington, Steller sea lions use haul-out sites primarily along the outer coast from the Columbia River to Cape Flattery (Jeffries et al. 2000). Smaller numbers use the Strait of Juan de Fuca (Wiles 2015). Numbers vary seasonally in Washington, with peak numbers present in the fall and winter months and a decline in the summer months, which corresponds to the breeding season at Oregon and British Columbia rookeries (approximately late May to early June) (Jeffries et al. 2000). In the Puget Sound, Jeffries (2012) identified five winter haul-out sites used by adult and sub-adult Steller sea lions. Numbers of animals observed at all of these sites combined were less than 230 individuals.

Steller sea lions can arrive in Washington inland waters by late September (Jeffries 2012). By May, most Steller sea lions have left inland waters and returned to their rookeries to mate. Occasionally, however, sub-adult (immature or pre-breeding animals) or non-breeding adults will remain in Puget Sound over the summer (Gearin 2008). There are no known haul-out sites in the vicinity of Port Angeles Harbor. The nearest haul-out to the project area is approximately 13 miles (20 km) north at Race Rocks, British Columbia (Wiles 2015).

California Sea Lion

California sea lions breed on islands located in southern California, western Baja California, and the Gulf of California during the summer. The primary rookeries are located on the California Channel Islands of San Miguel, San Nicolas, Santa Barbara, and San Clemente, and California sea lions seldom travel more than 31 miles (50 km) from the islands during the breeding season. Large numbers of adult and subadult male and juvenile sea lions migrate north after the breeding season and winter from central California to Washington State, returning south in the spring (Jeffries et al. 2000). There are no known California sea lion haul-outs in Port Angeles Harbor (WDFW 2015a). The nearest haul-out is approximately 40 miles (64 km) east of the project area near Admiralty Inlet (Jeffries et al. 2000).

California sea lions feed on a variety of fish and shellfish, including salmon, steelhead, herring, mackerel, and squid. It has been documented that salmon and steelhead comprise 10 to 30 percent of their diet in Washington State (WDFW 2010). The U.S. population of California sea lions is considered to be near the highest level the environment can sustain (Carretta et al. 2014).

California sea lions are typically present between August and June in Washington inland waters, with peak abundance numbers occurring between October and May (NMFS 1997; Jeffries et al. 2000). California sea lions could forage within Port Angeles Harbor, following local prey availability, but because their haul-outs are far away, use of the area is likely limited. During the summer months and associated breeding periods, the inland waters would not be considered a high-use area, because California sea lions would be returning to rookeries in California waters. However, surveys at Navy facilities indicate that a few individuals are present through mid-June to July, with some arrivals in August and in some cases individuals present year round (Navy 2014b).

Northern Elephant Seal

Northern elephant seals are found in the eastern and central North Pacific Ocean and can range from as far north as Alaska and as far south as Mexico. They typically breed in the Channel Islands of California or Baja California in Mexico (NMFS 2014b). Northern elephant seals spend most of the year (approximately 9 months) in the ocean. When on land they prefer sandy beaches (NMFS 2014b).

In Washington inland waters, there are regular haul-out sites at Smith and Minor islands, Dungeness Spit, and Protection Island in the Strait of Juan de Fuca that are thought to be used year round (Jeffries et al. 2000; Jeffries 2012). Typically, 2 to 10 individuals are present at these sites. The closest haul-out to the project area is at Dungeness Spit, approximately 14 miles (22 km) east of the project area (Jeffries 2012). Northern elephant seals are not expected to occur within Port Angeles Harbor because there are no known haul-outs in the vicinity and they typically use the same sites repeatedly; however, it is possible a juvenile could haul out near the project site and once on shore would likely stay for the duration of the project. In addition, elephant seals could forage within Port Angeles Harbor, following local prey availability.

Harbor Seal

Harbor seals are the most common, widely distributed marine mammal found in Washington marine waters and are frequently observed in the nearshore marine environment. Harbor seals are a coastal species, rarely found more than 12 miles (20 km) from shore, and frequently occupy bays, estuaries, and inlets where they feed on crustaceans, squid, mollusks, and a variety of fish (Baird 2001; Carretta et al. 2014). Harbor seals are generally non-migratory, and local occurrence varies with changes in the tides, weather, season, reproduction, and food availability. Harbor seals generally haul out on rocks, reefs, and beaches during the day and forage in marine and estuarine waters at dawn and dusk. Numerous harbor seal haul-outs occur in Washington inland waters with numbers of individuals using these haul-outs ranging from a few to 100 to 500 individuals (Jeffries et al. 2000).

Harbor seals are frequently observed swimming along Ediz Hook. They haul out year round on log booms and beach areas located approximately 1.5 to 2 miles (2.4 to 3.2 km) west, and on the fish pens immediately south of the project area (WDFW 2015a). Harbor seals may also use other undocumented haul-out sites near the project area.

3.3.2.6 Essential Fish Habitat (EFH)

The PFMC has designated EFH for each of the four primary fisheries that it manages within its FMPs: Pacific Coast groundfish, coastal pelagic species, Pacific Coast salmon, and West Coast highly migratory species (PFMC 2011a, b; 2014a, b, c). Of these fisheries, only three (Pacific Coast groundfish, coastal pelagic species, and Pacific Coast salmon) contain species for which EFH has been designated within the waters of Port Angeles Harbor. The federally managed species, life stages, and habitats, as indicated by PFMC FMPs, are summarized for the project area in Table 3.3-4.

Table 3.3-4. Fish Species with Designated EFH in Project Area

Species	Applicable Life Stages	Habitat
Pacific Coast Groundfish		
Arrowtooth flounder *(Atheresthes stomias)*	A, J, L, E	Unconsolidated bottom, epipelagic zone.
Big skate *(Raja binoculata)*	A, J, E	Unconsolidated and soft bottom sediments.
Black rockfish *(Sebastes melanops)*	A, J	Vegetated bottom, hard bottom, unconsolidated sediment.
Blue rockfish *(Sebastes mystinus)*	A, L	Vegetated bottom, hard bottom, epipelagic zone.
Butter sole *(Isopsetta isolepis)*	A	Muddy or silty sediment.
Bocaccio *(Sebastes paucispinis)*	J, L	Vegetated bottom, hard bottom, epipelagic zone.
Cabezon *(Scorpaenichthys marmoratus)*	A	Hard bottom.
California skate *(Raja inornata)*	A, J, E	Soft (muddy) bottom sediments.
Chilipepper *(Sebastes goodie)*	J	Sandy vegetated bottoms (kelp), epipelagic zone.
China rockfish *(Sebastes nebulosus)*	A, J	Rocky reef, vegetated bottoms (kelp).
Curlfin sole *(Pleuronichthys decurrens)*	A	Soft bottoms.
Darkblotched rockfish *(Sebastes cramen)*	A, J, L	Soft bottoms near cobble or boulders, epipelagic zone.
Dover sole *(Solea solea)*	A, J	Muddy bottom.
English sole *(Parophrys vetulus)*	A, J, L	Unconsolidated bottom, epipelagic zone.
Flathead sole *(Hippoglossoides elassodon)*	A, J	Unconsolidated sediments.
Greenstriped rockfish *(Sebastes elongates)*	A, J	Rocky reefs, soft bottoms.
Kelp greenling *(Hexagrammos decagrammus)*	A, L	Rocky reefs near dense algae or kelp, epipelagic zone.
Lingcod *(Ophiodon elongates)*	A, J, L, E	Unconsolidated sediments, rocky reefs, kelp and eelgrass beds, epipelagic zone.
Longnose skate *(Raja rhina)*	A, E, J	Mixed sediments.
Pacific cod *(Gadus microcephalus)*	A, J, E, L	Unconsolidated sediments.
Pacific grenadier *(Coryphaenoides acrolepis)*	E, L	Unconsolidated sediments, epipelagic zone.
Pacific hake *(Merluccius productus)*	A, E	Epipelagic zone.
Pacific ocean perch *(Sebastes alutus)*	L	Epipelagic zone.
Pacific sanddab *(Citharichthys sordidus)*	A	Sandy sediments.
Petrale sole	A, J	Soft sediments.

Table 3.3-4. Fish Species with Designated EFH in Project Area

Species	Applicable Life Stages	Habitat
(Eopsetta jordani)		
Quillback rockfish *(Sebastes maliger)*	A	Artificial structure, mixed bottom, vegetated bottom.
Rex sole *(Glyptocephalus zachirus)*	A, J	Unconsolidated sediments.
Rock sole *(Lepidopsetta bilineata)*	A	Hard bottom.
Rougheye rockfish *(Sebastes aleutianus)*	A, J	Steeply sloped bottom and muddy bottom.
Sablefish *(Anoplopoma fimbria)*	A, J, E	Unconsolidated sediments, drifting kelp, epipelagic zone.
Sand sole *(Psettichthys melanostictus)*	A, J, L	Unconsolidated sediments, epipelagic zone.
Sharpchin rockfish *(Sebastes zacentrus)*	A, J	Unconsolidated sediments.
Shortspine thornyhead *(Sebastolobus alascanus)*	J	Muddy bottom near rocks.
Soupfin shark *(Galeorhinus galeus)*	A, J	Unconsolidated sediments, epipelagic zone.
Spiny dogfish *(Squalus acanthias)*	A, J	Unconsolidated sediments, epipelagic zone.
Splitnose rockfish *(Sebastes diploproa)*	A, J, L	Muddy, vegetated bottoms (specifically eelgrass and kelp), epipelagic zone.
Spotted ratfish *(Hydrolagus colliei)*	A, J, E	Unconsolidated sediments, low-rocky relief.
Starry flounder *(Platichthys stellatus)*	A, J, E	Unconsolidated sediments, epipelagic zone.
Stripetail rockfish *(Sebastes saxicola)*	A, J	Unconsolidated sediments.
Widow rockfish *(Sebastes entomelas)*	J	Sand channels among rocks, soft substrata.
Coastal Pelagic		
Anchovy *(Engraulis mordax)*	A, L, E	All estuarine waters above the thermocline and falling between 50 and 68^{o}F (10 and 20^{o}C).
Market squid *(Loligo opalescens)*	A	Same as above.
Pacific Coast Salmon		
Coho *(Oncorhynchus kisutch*	A, J	Estuarine waters and substrates, including the nearshore and tidal submerged environments, and most freshwater bodies historically accessible to salmon (except above certain impassable natural barriers).
Chinook *(Oncorhynchus tshawytscha)*	A, J	
Pink *(Oncorhynchus gorbuscha)*	A, J	

Notes: A = adult, E = eggs, J = juvenile, L = larvae.
Sources: PFMC 2005a, b; 2014a, b, c.

EFH Designations

Pacific Coast Groundfish. Groundfish EFH is designated for species and life stages and includes the following primary habitats:

- The epipelagic zone of the water column (including macrophyte canopies and drift algae).
- Unconsolidated sediments consisting of mud, sand, or mixed mud/sand.
- Hard bottom habitats composed of boulder, bedrock, cobble, gravel, or mixed gravel/cobble.
- Mixed sediments composed of sand and rocks.
- Vegetated bottoms consisting of algal beds, macrophytes, or rooted vascular plants (PFMC 2014a).

The groundfish FMP provides habitat suitability maps indicating probability of occurrence of more than 90 species in Puget Sound (PFMC 2005a, b). This group of groundfish species was further refined for evaluation of the project area to a total of 40 groundfish species based on review of habitat suitability maps specific to the area surrounding Ediz Hook and including Port Angeles Harbor. Those species with a habitat suitability probability percentage of less than 1 percent were not included for analysis, as their presence in the action area would be very rare.

Coastal Pelagic. The coastal pelagic EFH consists of all estuarine and marine waters from the shoreline along the coasts of California, Oregon, and Washington offshore to the limits of the Exclusive Economic Zone (EEZ) and above the thermocline where sea surface temperatures range from 50 to 68ºF (10 to 20ºC) (PFMC 2011a). These boundaries include the waters surrounding Ediz Hook. The coastal pelagic FMP includes four finfish (Pacific sardine [*Sardinops sagax*], northern anchovy [*Engraulis mordax*], Pacific [chub] mackerel [*Scomber australasicus*], and jack mackerel [*Trachurus symmetricus*]). Also included is one invertebrate (market squid) and all euphausiid (krill) species that occur in the West Coast EEZ. The four finfish species are treated as a single species complex because of similarities in life histories and habitat requirements. Anchovy and market squid are expected to occur in the waters surrounding Ediz Hook (Table 3.3-4).

Pacific Coast Salmon. The Pacific Coast salmon EFH includes all estuarine and marine environments extending from nearshore and tidal submerged environments within state territorial waters out to the full extent of the EEZ offshore (PFMC 2014b, c). Chinook, coho, and pink salmon are the salmonid species with designated EFH. All three species use the marine environment for rearing as juveniles and offshore environment for migration as adults. All streams, estuaries, marine waters, and other water bodies occupied or historically accessible to salmon in Washington, Oregon, Idaho, and California are included within the EFH description (NMFS 2008).

Habitat Areas of Particular Concern (HAPCs)

In addition to EFH designations, the regional FMCs designated HAPCs, which are discrete subsets of EFH that provide extremely important ecological functions or are especially vulnerable to degradation (50 CFR 600.805 to 600.815). Regional FMCs may designate a specific habitat area as an HAPC based on one or more of the following reasons: (1) importance of the ecological function provided by the habitat; (2) the extent to which the habitat is sensitive to human-induced environmental degradation; (3) whether, and to what extent, development activities are, or will be, stressing the habitat type; and (4) rarity of the habitat type (NMFS 2002). Categorization as an HAPC does not confer additional protection or restriction to the

designated area. HAPCs have been designated for Pacific Coast groundfish and Pacific Coast salmon

Pacific Coast Groundfish. Designated HAPCs for Pacific groundfish include seagrass, canopy kelp, rocky reef, and estuarine habitats along the Pacific coast. The estuarine habitat HAPC extends landward to the MHHW or the upriver extent of saltwater intrusion. The closest estuarine HAPC is associated with the Elwha River, which empties into the Strait of Juan de Fuca, approximately 7 miles (11.5 km) west of the project area. Small populations of canopy kelp and seagrass (eelgrass) HAPCs occur in the project area. An underwater rock structure located just offshore of the jetty is inhabited by juvenile and adult groundfish.

Pacific Coast Salmon. Five HAPCs have been designated for Pacific Coast salmon: (1) complex channels and floodplain habitats; (2) thermal refugia; (3) spawning habitat; (4) estuaries; and (5) marine and estuarine submerged aquatic vegetation (PFMC 2014c). Eelgrass and kelp are HAPCs within the project area that provide important nursery, foraging, and shelter habitats to a variety of fish species, including salmon, as well as spawning substrate to Pacific herring, which is an important prey species for all marine life stages of Pacific salmon. Juvenile salmon utilize eelgrass beds as migratory corridors as they transition to the open ocean, and the beds provide both refuge from predators and an abundant food supply.

Description of Habitats

The existing conditions of EFH designated habitats are described in the following sections: Section 3.2, *Water Quality and Sediments*; Section 3.3.2.2, *Marine Vegetation*; and Section 3.4, *Noise.*

3.3.3 Environmental Consequences

Impacts on biological resources would be considered significant if there were a loss of high value habitat for fish or wildlife, or loss of a population or species, including through injury or noise harassment that would result from the Proposed Action. The evaluation of impacts on biological resources and their habitat considers whether the species is listed under the ESA or afforded federal protection under other regulations (e.g., Bald and Golden Eagle Protection Act, MMPA, MSA). Also considered is whether the species has a particular sensitivity to stressors of the Proposed Action, and/or a substantial or important component of the species' habitat (i.e., designated critical habitat and/or EFH) would be lost as a result of the Proposed Action. The main stressor to biological resources would be elevated noise and vibrations within the airborne and aquatic habitat during impact and vibratory pile driving. Before all environmental consequences of the Proposed Action are described for biological resources, a summary of the criteria for underwater and airborne noise impacts on fish, marine mammals, and the marbled murrelet is provided below.

3.3.3.1 Noise Level Criteria for Evaluation of Impacts

This section describes noise as it relates to fish and wildlife species. Noise effects on human populations are described in Section 3.4.

Fish

The degree to which an individual fish exposed to underwater sound is affected depends on numerous variables, including: species of fish, including presence of a swimbladder; size of fish; physical condition of the fish; maximum sustained sound pressure and frequency of the sound; shape of the sound wave (rise time); depth of the water; depth of the fish in the water column; amount of air in the water; size and number of waves on the water surface; bottom substrate composition and texture; water temperature and salinity; effectiveness of bubble curtain sound/pressure attenuation technology; tidal currents; and presence of predators. Depending on

these factors, effects on fish can range from changes in behavior to immediate mortality. There has been no documented injury or mortality resulting from the use of vibratory pile drivers; however, fish injury from impact hammers has been documented (California Department of Transportation [Caltrans] 2009a).

Three metrics are commonly used to evaluate noise impacts on fish (Caltrans 2009a):

- Peak Sound Pressure Level (L_{peak}) – Peak sound pressure level based on the largest absolute value of the instantaneous sound pressure over the frequency range from 20 to 20,000 hertz (Hz). Pressure is unweighted and measured as decibels referenced 1 microPascal (dB re 1µPa).
- Root Mean Square (RMS) – RMS level is the square root of the energy divided by a defined time period.
- Sound Exposure Level (SEL) – Constant level over 1 second that has the same amount of acoustic energy, as indicated by the square of the sound pressure, as the original sound.

The Fisheries Hydroacoustic Working Group (FHWG) is a multi-agency group that includes members from Caltrans, Oregon Department of Transportation, the Washington State Department of Transportation (WSDOT), Federal Highway Administration (FHWA), NMFS, USFWS, California Department of Fish and Wildlife, and the USACE. This technical working group is responsible for determining the criteria for noise effects on fish from underwater noise associated with pile driving activities. The FHWG developed the Agreement in Principle for *Interim Criteria for Injury to Fish from Pile Driving Activities* that establishes a 206-dB peak and a 187-dB cumulative SEL for all fish greater than 2 grams (g) (0.07 ounces [oz]) and a 183-dB cumulative SEL for fish less than 2 g (0.07 oz) (FHWG 2008).

Marine Mammals

NMFS uses sound exposure thresholds to determine when an anthropogenic activity in the ocean that produces sound might result in impacts on a marine mammal such that a take by harassment might occur (NMFS 2005d). These thresholds are used to determine compliance with the MMPA (16 U.S.C. § 1362 Sec. 3 (13)) and the ESA (7 U.S.C. § 36 and 16 U.S.C. § 1531 et seq.), but the effects determinations and language used to report exposure to harmful noise levels are different for the two statutes. As described in Section 3.3.1, the MMPA imposes a moratorium on the taking of marine mammals, where “take” means to harass, among other actions. The MMPA defines two levels of harassment, each of which has been assigned noise exposure thresholds.

> **Injury thresholds** are applied to a situation where the noise has the potential to injure a marine mammal or marine mammal stock in the wild (16 U.S.C. §1362 Sec. 3 (18)(A)(i)). Previously NMFS used the following sound exposure thresholds: cetaceans and pinnipeds exposed to underwater sound pressure levels (SPLs) of 180 and 190 dB RMS or above, respectively, were considered to be exposed to injurious level of sound (Level A harassment). On August 4, 2016, NMFS released its Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (NMFS 2016). The guidance established new thresholds for predicting auditory injury, which equates to Level A harassment under the MMPA.

- **Behavioral disturbance thresholds** are applied to situations where the noise “has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of natural behavior patterns, including, but not limited to, migration, breathing, nursing, breeding, or sheltering” (16 U.S.C. §1362 Sec. 3 (18)(A)(ii)). Behavioral

disturbance (Level B harassment) occurs when marine mammals are exposed to impulsive underwater sounds above the 160-dB RMS threshold from impact pile driving, and to non-impulsive underwater sounds above the 120-dB RMS threshold from vibratory pile driving.

NMFS has identified behavioral harassment threshold criteria for airborne noise generated by pile driving for pinnipeds regulated under the MMPA. Level A injury threshold criteria for airborne noise have not been established. The Level B behavioral harassment threshold for harbor seals is 90 dB RMS re 20 µPa (unweighted), and for all other pinnipeds is 100 dB RMS re 20 µPa (unweighted).

The application of the 120-dB RMS threshold can sometimes be problematic because this threshold level can be either at or below the ambient noise level of certain locations. As a result, these levels are considered precautionary (NMFS 2009b).

Marbled Murrelet

Airborne Noise

Pile driving can generate airborne noise that could potentially result in masking of communication between marbled murrelets when on the water. A Marbled Murrelet Science Panel was convened to review noise levels that may result in masking of marbled murrelet calls. The panel issued a report, which provided a recommendation for a threshold value and calculation instructions (SAIC 2012). The USFWS further developed the guidance for marbled murrelet communication masking as a result of impact pile driving (USFWS 2014b). The distance to the marbled murrelet airborne masking threshold is set at a radius of 138 feet (42 m) from an impact-driven steel pile smaller than 36 inches in diameter. For piles that are 36 inches or larger, the masking threshold is set at a radius of 550 feet (168 m) from the pile during impact pile driving (USFWS 2014b).

Underwater Noise

Underwater onset of injury thresholds for marbled murrelets only apply to impact pile driving of steel piles, and the distance to the injury criterion depends on the number of strikes of the impact hammer that are carried out in a 24-hour period. The USFWS uses thresholds for two general forms of injury: (1) auditory injury (generally damage to sensory hair cells of the ear) beginning at 202 dB SEL cumulative; and (2) non-auditory injury (trauma to non-auditory body tissues/organs) of 208 dB SEL cumulative. The onset of auditory injury is defined as the loss of hair cells due to impulsive acoustic overexposure. Injuries associated with non-auditory injury (barotrauma) could include bruising, hemorrhaging, rupture of internal organs, and/or death. Since the underwater criterion for auditory injury was the lower of the two thresholds, this is the criterion used for assessing injurious impacts on the marbled murrelet in this analysis. Airborne and underwater noise injury and disturbance thresholds for fish, marine mammals, and marbled murrelets applicable to impact pile driving are summarized in Table 3.3-5.

A conservative approach was used to select source levels for analyzing impacts on marine species. Available information from various pile driving studies was reviewed, and the most relevant to the Proposed Action in terms of pile type and size, water depth, and substrate was used. The reference source levels were further reduced assuming that a bubble curtain attenuation rate of 7 dB for 66-inch diameter steel piles (Caltrans 2012), and 8 dB for 24-inch, 30-inch, and 36-inch diameter steel piles could be achieved during impact pile driving (Navy 2014c).

Table 3.3-5. Airborne and Underwater Noise Injury and Disturbance Thresholds for Fish, Marine Mammals, and Marbled Murrelets during Impact Pile Driving

Hearing Group	Airborne Noise Thresholds (dB re 20 µPa) Sound Pressure Level		Underwater Noise Thresholds (dB re 1 µPa) Injury Threshold	Underwater Noise Thresholds (dB re 1 µPa) Behavioral Harassment Threshold
Cetaceans (whales, dolphins, porpoises)	NA		180 dB RMS	160 dB RMS
Pinnipeds (sea lions)				
Seals and sea lions	100 dB RMS		190 dB RMS	160 dB RMS
Harbor seal	90 dB RMS			
Fish ≥ 2 grams	NA		187 dB Cumulative SEL	150 dB RMS
Fish < 2 grams			183 dB Cumulative SEL	
Fish all sizes			206 dB Peak	
Foraging marbled murrelets	*Masking Zone*		202 dB SEL	150 dB RMS (guideline)
	Piles <36 inches	42 m		
	Piles ≥36 inches	168 m		

Notes: NA = not applicable, no established threshold.
Sources: NMFS 2005d; FHWG 2008; USFWS 2014b; WSDOT 2014.

3.3.3.2 Alternative 1: Midwestern Site (Preferred Alternative)

Birds

Noise generated during pile driving activities proposed under Alternative 1 would be the primary source of disturbance to birds that may be present within the project area or immediately adjacent to it. There are no established noise thresholds for birds other than marbled murrelet (refer to the analysis on ESA-listed species below for marbled murrelet). As described in Section 3.4.2.1, ambient airborne noise levels were recorded at 52.1 A-weighted decibels (dBA) re 20 µPa on Ediz Hook (Sargeant 2013). Other sounds generated at USCG AIRSTA/SFO Port Angeles would be from common industrial and maintenance equipment and vehicles, with helicopter operations likely producing the highest noise levels. Noise levels were recorded as high as 88.9 dBA re 20 µPa when a USCG Dolphin helicopter flew over during sound level measurements (Sargeant 2013). Airborne noise levels from impact pile driving would be approximately 112 dBA re 20 µPa at a distance of 50 feet (15 m) from the pile, and from vibratory pile driving would be approximately 95 dBA re 20 µPa at a distance of 50 feet (15 m) from the pile. Other construction activities may utilize heavy machinery (e.g., cranes), trucks, or generators, which would also create noise. However, this noise level would be lower compared to noise produced from an impact hammer pile driver. In the absence of pile driving noise, maximum construction noise would be approximately 94 dBA re 20 µPa at a distance of 50 feet (15 m) from the activity, computed as the summation of noise of all equipment operating simultaneously (WSDOT 2015).

Various birds utilize the upland and shoreline areas of the project area as well as the nearshore marine areas for resting, nesting, and foraging, and would likely be within the vicinity of the Alternative 1 site during proposed construction operations. The presence of construction activity and additional personnel in general would likely deter many birds from occurring within the immediate area. As described above, impact pile driving would generate the highest noise levels (112 dBA re 20 µPa). Since noise levels decrease by approximately 6 dBA with each doubling of distance, the average airborne sound levels would not attenuate down to ambient levels until a distance of approximately 50,000 feet (15,240 m). However, as the airborne noise crosses the harbor and approaches the industrial noise generated from the Port of Port Angeles

and noise from the City of Port Angeles, in general, ambient noise levels of 52.1 dBA re 20 µPa would likely not be achieved. Therefore, pile driving noise disturbance may cause some bird species to temporarily avoid the project area, but they would likely move to other habitat along Ediz Hook with very little behavioral disturbance expected. Foraging bald eagles may temporarily avoid the area within the immediate vicinity of pile driving, but this is not expected to result in significant impacts as eagles could continue to forage within Port Angeles Harbor and other nearby areas. Therefore, there would be short-term and localized disturbance to resting and foraging birds, including bald eagles, but no significant long-term impacts would result.

The upland areas of USCG AIRSTA/SFO Port Angeles are primarily previously disturbed areas with no vegetation that would provide suitable nesting habitat (i.e., tall trees). The closest bald eagle nest site is approximately 3 miles (4.8 km) west of the Alternative 1 site, near the Port of Port Angeles (WDFW 2014b). Considering that the nests are located closer to industrial areas at the Port of Port Angeles than to the project area, nesting eagles have likely habituated to higher background noise levels than they would be exposed to from the proposed project. Therefore, no significant impacts on nesting birds, including nesting bald eagles, would occur.

There would be short-term and localized impacts on resting and foraging birds, as they would likely move to other nearby habitats during construction. No long-term impacts on birds (including bald eagles) would result post construction. No significant impacts on birds would result with implementation of Alternative 1.

Marine Vegetation

Marine vegetation is present in the project area, encompassing various species of eelgrass, kelp, and algae (SEE LLC 2015). A survey conducted in July 2015 documented a total of 98,873 ft^2 (9,185 m^2) of eelgrass occurring in a continuous bed primarily between 0 and -20 feet (0 and -6 m) MLLW, with some plants occurring as deep as -35 feet (-10.7 m) MLLW. Impacts from sediment turbidity during pile driving and shading from construction barges could occur but would be temporary. Avoidance and minimization measures would be implemented to avoid directly damaging or minimize impacts on eelgrass in the project area during construction. For example, construction barges would avoid anchoring or spudding in eelgrass areas and would likely be farther offshore and away from potential shading of eelgrass during trestle installation.

Pile installation would occur within documented eelgrass beds. Approximately 745 ft^2 (69 m^2) of eelgrass is expected to be lost due to the placement of piles. After construction, the new pier would create overwater coverage within the project area and over existing eelgrass beds. Overwater coverage reduces light penetration and leads to a reduction in vegetation or compromised benthic vegetation function (Haas et al. 2002). Following completion of the TPS pier, 8,650 ft^2 (803 m^2) of permanent shading would result over the nearshore areas shallower than -30 feet (-9 m) MLLW. The total amount of eelgrass impacted from pile placement and shading is expected to be 4,595 ft^2 (427 m^2). Proposed compensatory mitigation for the loss of aquatic resources and treaty mitigation are expected to create a net gain of 38,255 ft^2 (3,177 m^2) of unshaded nearshore habitat suitable for eelgrass colonization. With the implementation of the proposed compensatory mitigation and treaty mitigation (see Section 2.6), no significant impacts on marine vegetation would result with implementation of Alternative 1.

Marine Invertebrates and Fish

Underwater Noise

Construction activities associated with Alternative 1 would result in temporary increases of underwater noise levels in the project area, due primarily to impact pile driving activity. Some noise would also be generated from support vessels, small boat traffic, and barge-mounted

equipment such as generators or cranes. The in-water noise with the greatest potential for affecting marine fish would be from impact pile driving, which is analyzed below.

Piles ranging in size from 18 to 36 inches would be installed under Alternative 1. However, a conservative approach of modeling noise levels generated from 24-inch and 30-inch diameter steel piles was used, as source levels evaluated from past acoustic studies determined that these two pile sizes typically generated higher noise levels than 18-inch and even 36-inch diameter steel piles (Navy 2014c). These source levels were used to model noise from impact pile driving that would exceed the thresholds established for fish. Because a bubble curtain or other attenuation device would be used to minimize the noise generated by driving steel piles, an expected attenuation of 8 dB SPL for 24-inch and 30-inch diameter piles was first subtracted from the source levels (Navy 2014c). As described in Section 2.4, proofing each pile would require up to 1,600 strikes. This noise analysis is based upon a maximum of 7,000 strikes per day under Alternative 1.

The distances to the thresholds are shown in Table 3.3-6. Since the cumulative SEL formula takes into account all impact pile strikes within a 24-hour period, the area depicted in Figures 3.3-5 and 3.3-6 is the size of the injury zone as it has increased to its maximum extent through the course of a pile driving day. As a result, during the early portion of the construction day, the injury zone would be smaller and would only gradually increase out to the final distance.

Table 3.3-6. Maximum Range to Fish Sound Criteria Thresholds during Pile Driving – Alternative 1: Midwestern Site

Method and Pile Size	Criteria Threshold (distance/area)			
	206 dB PEAK (injury)	187 dB Cumulative SEL for fish >2g (injury)	183 dB Cumulative SEL for fish <2g (injury)	150 dB RMS (behavioral)
Impact Pile Driving				
24 inches	5 m/<0.01 km^2	341 m/0.25 km^2	341 m/0.25 km^2	2.5 km/9.8 km^2
30/36 inches	14 m/<0.01 km^2	736 m/0.99 km^2	736 m/0.99 km^2	2.9 km/11.8 km^2
Vibratory Pile Driving				
24 inches	NA	NA	NA	63 m/0.01 km^2
30/36 inches	NA	NA	NA	136 m/0.06 km^2

Notes: NA = not applicable. Source levels for 30-inch piles were modeled but threshold distance calculated also encompasses 36-inch piles as their SPLs were found to be lower than 30-inch piles (Navy 2014c). All SPLs expressed in dB re 1 µPa; SEL are expressed in dB re 1 μPa^2*sec. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distance) used for calculations. Assumes 8 dB attenuation with use of a bubble curtain. Cumulative SEL calculated as Single Strike SEL + 10 * log (# of pile strikes), assumes eight piles installed/day at 7,000 pile strikes/day.

Impacts on juvenile salmonids would be minimized by pile driving only during the in-water work window of July 16 through February 15. However, other juvenile fish species as well as adult fish species may be exposed to injury and behavioral disturbance thresholds. Adult species would likely swim away and/or avoid the area in general with very little disturbance. Juvenile forage fish and groundfish have the potential to occur within the behavioral or injury zones during pile driving. In-water noise from pile driving would most likely impact sand lance for which the peak spawning periods (November to mid-February) coincide with the in-water construction period, as well as juvenile rockfish and other groundfish that occur year round at the underwater rock pile near the jetty (approximately 1,600 feet [488 m] west of the Alternative 1 site). These fish would be exposed to injurious and behavioral noise impacts that could cause injury to or death of these fish. Since vibratory pile drivers typically generate noise levels lower than impact pile drivers and do not produce waveforms with sharp rise times like impact pile driving, impacts on fish are typically not observed in association with vibratory pile driving (WSDOT 2015).

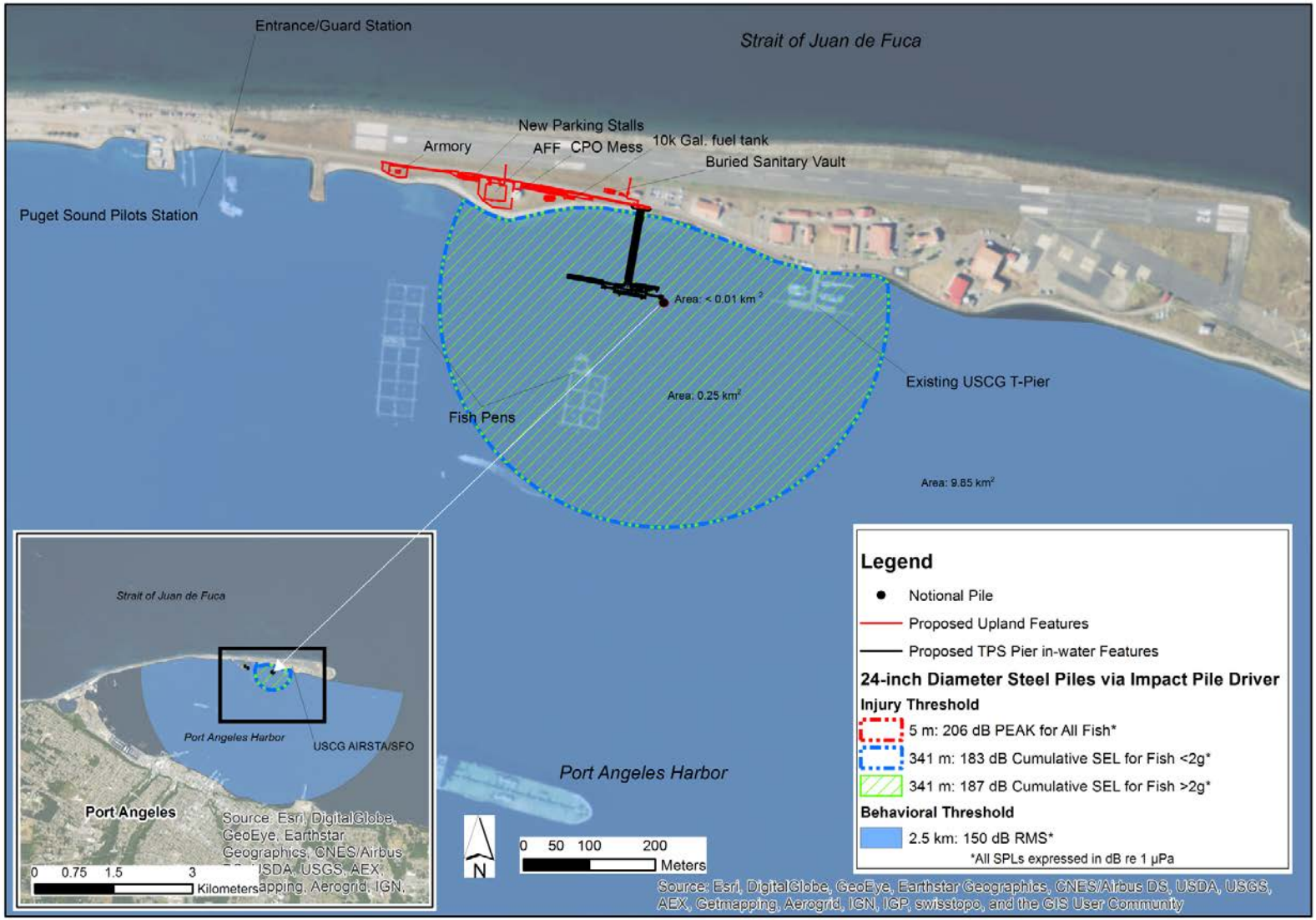

Figure 3.3-5. Representative View of Affected Areas for Fish Due to Underwater Noise from Impact and Vibratory Pile Driving, 24-inch Diameter Steel Piles

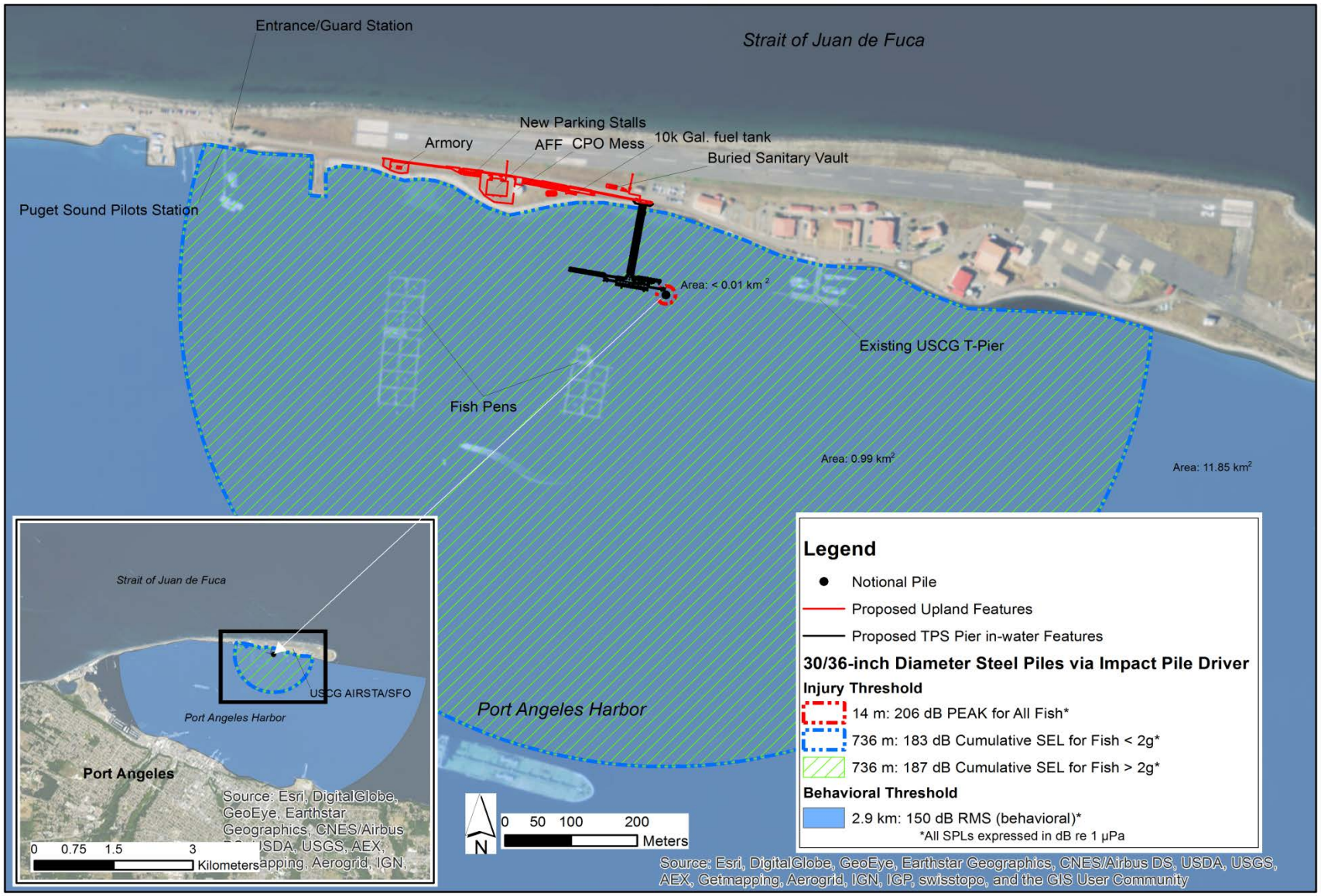

Figure 3.3-6. Representative View of Affected Areas for Fish Due to Underwater Noise from Impact and Vibratory Pile Driving, 30/36-inch Diameter Steel Piles

To minimize underwater noise impacts during pile driving, the majority of pile driving activity would be conducted using a vibratory pile driver, with impact pile driving only to proof piles or under hard substrate conditions that require additional impact pile driving. All pile driving would require approximately 75 days, with an estimated duration of impact pile driving ranging from several minutes to a maximum of 4 hours per day for up to 75 days. A bubble curtain would be used to attenuate underwater noise during impact pile driving. In addition, the bubble curtain would be turned on prior to initiation of pile strikes and would likely flush fish away from the injury zone near the pile. Impacts from noise disturbance would be short term and localized.

Turbidity

Temporary increases of suspended sediment would likely occur from pile driving and anchor placement/removal. The extent of suspended sediment would be increased above baseline conditions, primarily in the immediate construction area, with the duration of suspension dependent on the substrate at the site being disturbed; in general, coarser substrates exhibit relatively quick settling times, and finer substrates exhibit longer suspension times. Impacts on benthic organisms potentially include physical damage, burial, and foraging impacts for filter feeders, but these effects would be spatially limited to the area immediately surrounding pile work.

Physical Barriers and Overwater Shade

In-water construction would affect benthic organisms through bottom disturbance from pile placement and pile driving as well as anchor placement/removal. Approximately 745 ft^2 (69 m^2) of benthic habitat would be displaced by piles. Benthic communities occurring within the footprint of the piles would be at risk of direct mortality during pile installation or loss of habitat due to seafloor displacement. These disturbances would be localized, and previous studies of disturbed sites show that benthic and epibenthic invertebrates recolonize disturbed bottom areas within 2 years of disturbance (CH2M Hill 1995; Parametrix 1994, 1999; Anchor Environmental 2002; Romberg 2005). Therefore impacts on existing benthic communities, their habitat, or available benthic prey base for juvenile fish would not be significant. In addition, Alternative 1 construction activities would occur during the in-water work window and therefore avoid the time period when smaller nearshore-dependent juvenile salmonids would forage on intertidal and shallow subtidal benthic invertebrates as a prey source during their out-migration.

Upon completion of the TPS pier, approximately 745 ft^2 (69 m^2) of benthic habitat would be displaced by piles, and the resulting total overwater coverage for the trestle, fixed pier, and associated floats would be 25,465 ft^2 (2,365 m^2). The trestle component would create approximately 8,650 ft^2 (803 m^2) of permanent overwater shade within the nearshore areas shallower than -30 feet (-9 m) MLLW where eelgrass and other vegetation are present (see the *Marine Vegetation* subsection above) as well as benthic species. The reduction in light would cause vegetation within the proposed footprint of the trestle to die off. In addition, shadows cast by overwater structures create a light/dark interface that allows ambush predators to remain in darkened areas to wait for prey (Helfman 1981). Kahler et al. (2000) found that pier lighting may increase nocturnal predation on juvenile Chinook and coho salmon by visual predators like trout and piscivorous birds. Therefore, prey become more susceptible to predation when moving around the structure and unable to locate the predator. Further, shadows from large overwater structures built within nearshore environments can disrupt juvenile Pacific salmon migratory behavior. A study conducted at ferry terminals found that juvenile salmon (predominantly pink salmon [*O. gorbuscha*]) would avoid swimming under docks and shaded areas, causing delay in migration by several hours during the daytime at high tide periods and on sunny days (Ono et al. 2010). Overwater coverage would reduce vegetation and refugia, and alter the existing species composition inhabiting the area to more shade-preferring species, as well as potentially

affect juvenile salmon migration behavior. This reduction in vegetation would be localized to 8,650 ft^2 (803 m^2) of the Alternative 1 site, which would not significantly reduce marine vegetative communities within the action area or significantly alter juvenile migration behavior. Further, proposed compensatory mitigation for the loss of aquatic resources and treaty mitigation would create approximately 34,200 ft^2 (3,177 m^2) of new unshaded nearshore habitat to minimize and offset the loss of aquatic resources from the TPS pier (see Section 2.6).

Avoidance and minimization measures identified in Section 2.5 include the following:

- Avoiding long-term shading of existing eelgrass from barges.
- Avoiding spudding or anchoring within eelgrass.
- Conducting in-water work from July 16 through February 15 (USACE 2012) to avoid juvenile salmonids.
- Using a bubble curtain during impact pile driving.

With the implementation of these avoidance and minimization measures, no significant impacts on marine vegetation, marine fish, or invertebrates would result with the implementation of Alternative 1.

Special-Status Species

ESA-listed Species and Critical Habitat

Fish Species

Impacts described above for fish species would also apply to the ESA-listed PS Chinook ESU, PS steelhead DPS, HC chum ESU, bull trout, southern eulachon DPS, and southern green sturgeon DPS. Pile driving would increase underwater noise levels above established impact thresholds for fish. Approximately 75 days of pile driving would occur during the in-water work window when juvenile salmonids are least likely to be present. As previously stated, juvenile Chinook and chum have been documented in the area during spring and summer. Therefore, juvenile salmon could still potentially be exposed to effects of underwater sound despite adherence to the work windows. Resident and returning Chinook, returning summer-run chum, and steelhead that occur within the harbor could be present during the period of in-water construction and would be exposed to elevated underwater sound levels during pile driving. These fish would not be protected by the work windows, although the majority exposed would be larger in size, would not be nearshore dependent, and would not be expected to remain in the work area for any extended period of time. However, these fish would still be exposed, temporarily, to injurious levels of underwater sound from impact pile driving as the injurious threshold zone extends out into deeper water. As noted above, these fish could display either a startle or behavioral response. The southern green sturgeon and eulachon DPSs are not expected to occur in the project area; therefore, impacts on these species from in-water construction are not expected.

PS Chinook salmon ESU, bull trout, and southern green sturgeon DPS have designated critical habitat within the action area. Small numbers of nearshore-dependent juvenile PS Chinook salmon could be present in the area during the in-water work window and hence injurious noise level impacts would occur for the nearshore PCE during construction. Adult PS Chinook occurring within the offshore marine areas of the harbor as well as bull trout migrating through the area would likely be exposed temporarily to injurious noise levels that extend offshore over deeper water, impacting the offshore PCE for PS Chinook Salmon ESU and migrating habitats PCE for bull trout. Impacts on the water quality and food resource PCEs for southern green sturgeon DPS would be insignificant as sturgeon have not been observed in the harbor but more likely would occur within the Strait of Juan de Fuca, outside of any injurious or behavioral noise disturbance. Further, their rare occurrence in the harbor makes it unlikely they would

regularly forage within the harbor. Therefore, there would be no impacts on water quality (i.e., noise and turbidity) or food resource PCEs for the southern green sturgeon DPS.

The completion of the TPS pier would result in overwater shade that could potentially impact juvenile ESA-listed salmon through prey and habitat reduction and altering migration behavior. However, these potential impacts would be localized to 8,650 ft^2 (803 m^2) within the nearshore areas shallower than -30 feet (-9 m) MLLW and would not significantly impact juvenile ESA-listed salmonids within the action area. Following completion of construction, the nearshore PCE for PS Chinook salmon ESU and abundant food base PCE for bull trout may be affected through the addition of barriers (piles) and shade. However, the new TPS pier would be localized to the Alternative 1 footprint (within 25,465 ft^2 [2,365 m^2] of total overwater coverage) and would have no significant impact on these designated critical habitat PCEs in the action area.

Avoidance and minimization measures identified in Section 2.5 include the following:

- Conducting in-water work from July 16 through February 15 to minimize impacts on juvenile salmonids.
- Using a bubble curtain for attenuation during impact pile driving.

While there would be temporary, short-term impacts on ESA-listed salmonids and designated critical habitat, with the implementation of avoidance and minimization measures, as well as implementation of the proposed compensatory mitigation and treaty mitigation, no significant long-term impacts would result under Alternative 1.

Southern Resident Killer Whale

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NMFS has identified different thresholds for behavioral disturbance for vibratory pile driving versus impact pile driving. There is a potential for behavioral disturbance as the 120-dB zone for vibratory pile driving encompasses a larger area within the action area (Port Angeles Harbor and extending out to the east) (Table 3.3-7; Figures 3.3-7 and 3.3-8). Marine mammal monitoring would shut-down pile driving if SRKWs approach the behavioral disturbance zone. SRKW would never be exposed to injurious effects of pile driving because pile driving would be shut-down for any marine mammal within 100 m of pile driving. In addition, SRKW would be rare in the area and pile driving would only occur for up to 75 days.

Table 3.3-7. Calculated Distances to Underwater Marine Mammal Noise Thresholds during Pile Driving – Alternative 1: Midwestern Site

Method	Injury – Pinnipeds: 190 dB RMS (distance/area)	Injury – Cetaceans: 180 dB RMS (distance/area)	Behavioral Disturbance (Impact) – 160 dB RMS (distance/area)	Behavioral Disturbance (Vibratory) – 120 dB RMS (distance/area)
Impact Pile Driving				
24 inches	5 m/<0.01 km^2	22 m/<0.01 km^2	464 m/ 0.4 km^2	NA
30/36 inches	6 m/<0.01 km^2	29 m/<0.01 km^2	631 m/ 0.7 km^2	NA
Vibratory Pile Driving				
24 inches	NA	NA	NA	6.3 km/20.4 km^2
30/36 inches	NA	NA	NA	13.5 km/29.9 km^2

Notes: NA = Not Applicable. Assumes 8 dB attenuation. All source levels relative to 1 µPa. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distance) used for calculations.

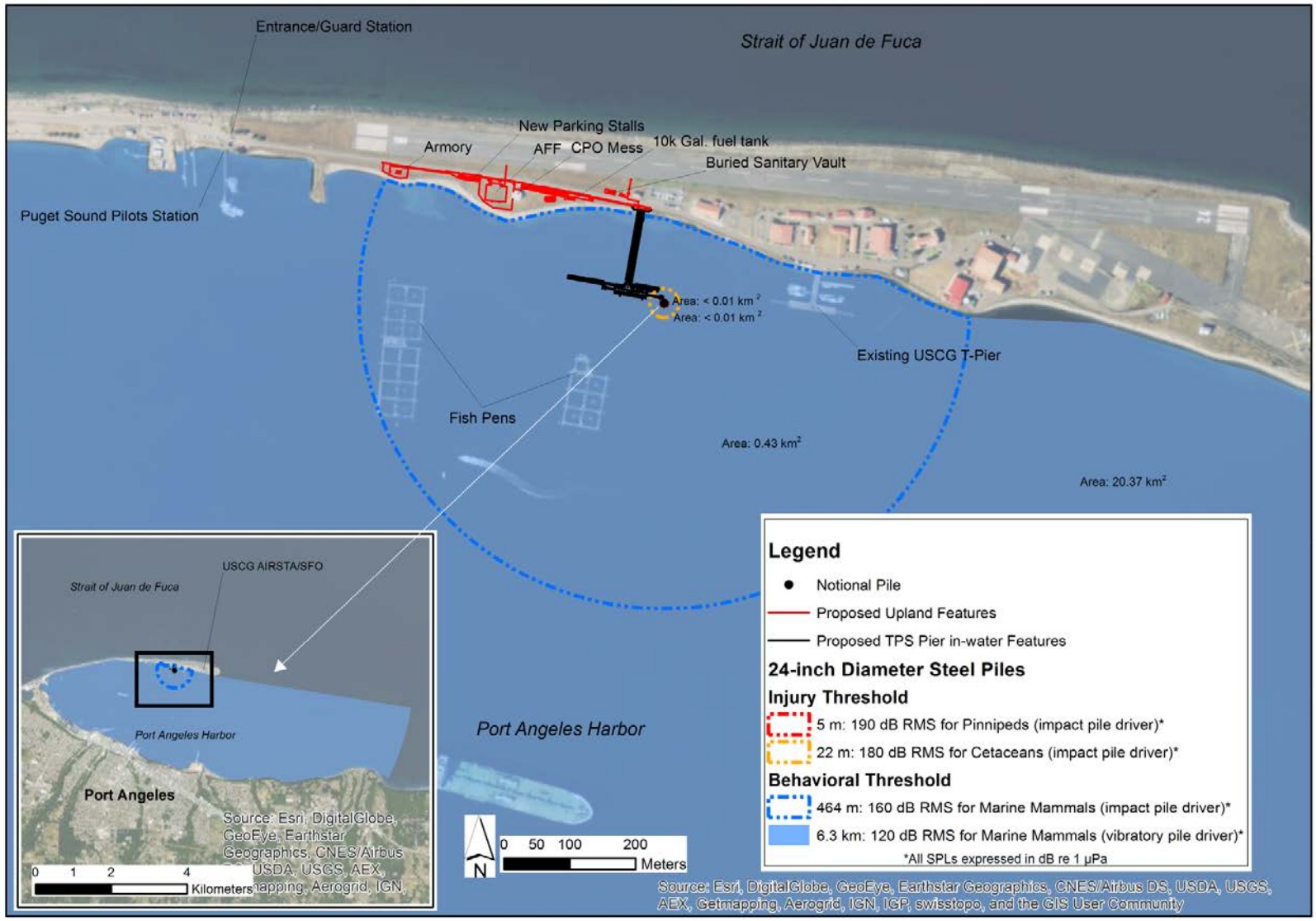

Figure 3.3-7. Representative View of Affected Areas for Marine Mammals Due to Underwater Noise from Pile Driving, 24-inch Diameter Steel Piles

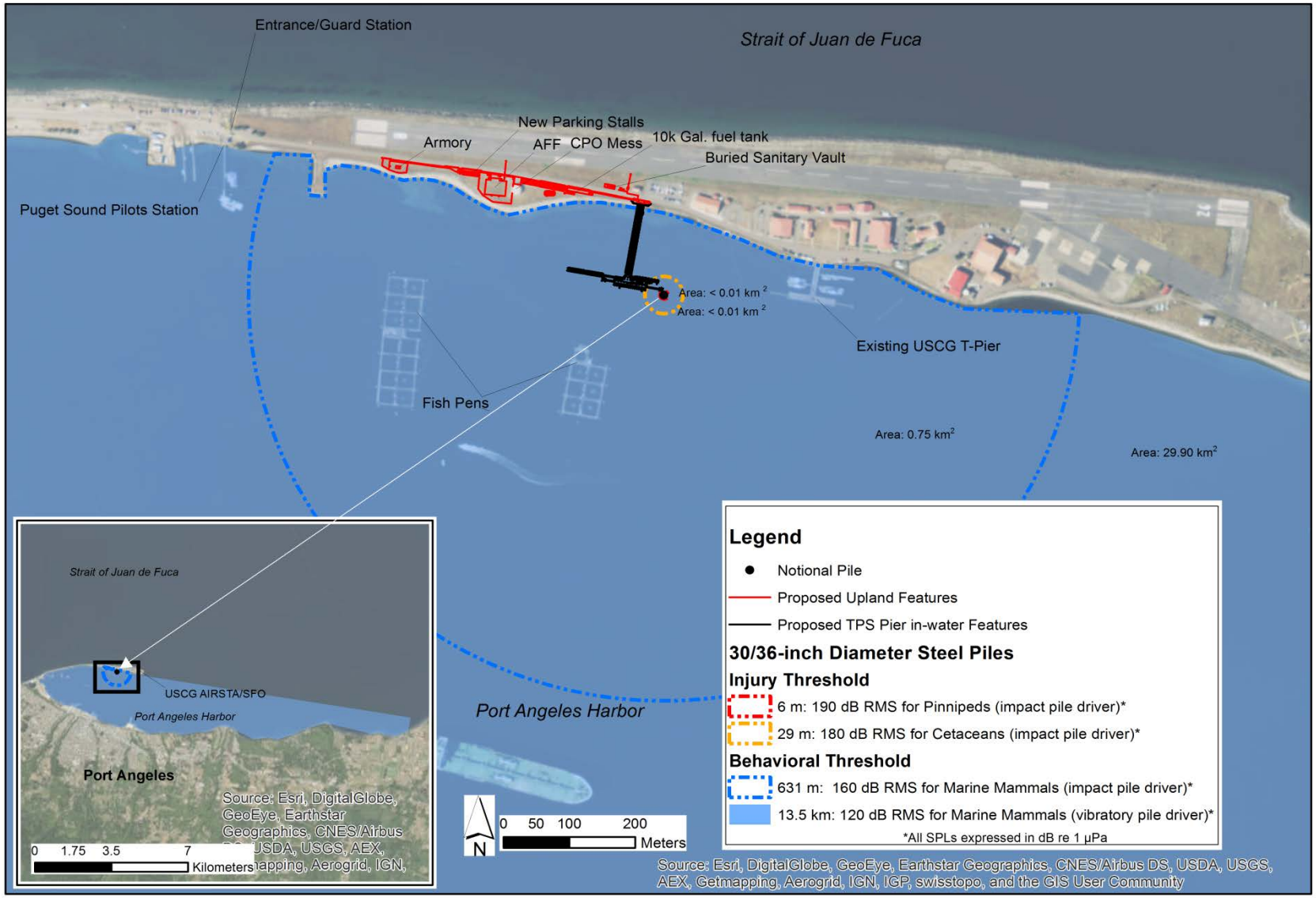

Figure 3.3-8. Representative View of Affected Areas for Marine Mammals Due to Underwater Noise from Pile Driving, 30/36-inch Diameter Steel Piles

Water deeper than 20 feet (6 m) in Port Angeles Harbor is designated SRKW critical habitat and includes the following PCEs: (1) water quality to support growth and development; (2) prey species of sufficient quantity, quality, and availability to support growth; and (3) passage conditions to allow for migration, resting, and foraging. No significant impacts on critical habitat would occur, as increased turbidity during pile driving would be localized and short term (lasting a maximum of 75 days) and would not degrade water quality where SRKW would occur. Further, pile driving would occur during the in-water work window, when juvenile salmonids (prey) are least likely to be present. Lastly, the passage of killer whales may occur within the farthest extent of the 120-dB behavioral zone (see Figures 3.3-7 and 3.3-8), but their presence would only be short term and temporary.

Humpback Whale

There are no recorded sightings of humpback whales within Port Angeles Harbor. The nearest sightings to the action area have been within the deep waters of the Strait of Juan de Fuca.

Avoidance and minimization measures listed in Section 2.5 include the following:

- During impact pile driving, visual monitoring would be conducted for the 160-dB RMS behavioral disturbance zone of 2,070 feet (631 m). Pile driving would cease should a humpback whale approach the behavioral disturbance zone.
- During vibratory pile driving, visual monitoring of the 120-dB RMS behavioral disturbance zone of 8.5 miles (13.6 km) would be conducted. Pile driving would cease should a humpback approach the behavioral disturbance zone.
- A bubble curtain would be used during impact pile driving.

With the implementation of these avoidance and minimization measures, no significant impacts on SRKW or humpback whales would result with the implementation of Alternative 1.

Marbled Murrelet

Little is known about the general airborne hearing or underwater hearing capabilities of birds. What has been determined is that there are three classes of potential effects identified for birds from noise (e.g., traffic or construction): (1) physiological and behavioral effects; (2) damage to hearing from acoustic over-exposure; and (3) masking of important bioacoustic and communication signals (Dooling and Popper 2007). Past research was not specific to seabirds or shorebirds, with studies done on other avian species (i.e., owls and songbirds); however, guidance provided by the Marbled Murrelet Science Panel has recently become available (SAIC 2011, 2012) (see Table 3.3-5).

The distances to the auditory threshold were calculated using the same methods previously described for fish. The auditory injury threshold (cumulative SEL = 202 dB) is estimated to extend 301 feet (92 m) during impact pile driving of a 30-inch diameter pile, and 223 feet (68 m) during 36-inch diameter pile driving (Table 3.3-8). Therefore, marbled murrelets could be exposed to injurious noise levels if they were at or within 301 feet (92 m) of a pile during impact pile driving after all strikes were completed (Figures 3.3-9 and 3.3-10). Because the cumulative SEL formula takes into account all impact pile strikes within a 24-hour period, the 301-foot (92-m) area is the size of the injury zone as it has increased to its maximum extent through the course of the pile driving day. As a result, during the early portion of the construction day, the injury zone would be smaller and would only gradually increase out to a distance of 301 feet (92 m) after all strikes have been completed.

Table 3.3-8. Maximum Range to Marbled Murrelet Underwater Injury and Airborne Masking Sound Thresholds during Impact Pile Driving – Alternative 1: Midwestern Site

Steel Pile Size	Underwater Injury Threshold: 202 dB SEL (distance/area)	Airborne (Masking) (distance/area)
24 inches	43 m/<0.01 km^2	42 m (<0.01 km^2)
30 inches	92 m/0.03 km^2	42 m (<0.01km^2)
36 inches	68 m/0.01 km^2	168 m (0.09 km^2)

Notes: Assume 8 dB attenuation. All SPLs expressed in dB re 1 µPa; SEL are expressed in dB re 1 μPa^2*sec. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distanced) used for calculations. Cumulative SEL calculated as Single Strike SEL + 10 * log (# of pile strikes) and assumes 7,000 pile strikes/day.

In addition, airborne pile driving noise has the potential to affect foraging behavior and efficiency through masking effects because murrelets forage in pairs and masking would impact their ability to communicate (SAIC 2012). Based on USFWS guidance for marbled murrelet communication masking as a result of impact pile driving (USFWS 2014b), the distance to the marbled murrelet airborne masking threshold is set at a radius of 138 feet (42 m) from an impact driven pile less than 36 inches in diameter (Table 3.3-5). In addition, for the larger 36-inch piles, the masking threshold would be 550 feet (168 m) from the pile. All other construction noise associated with Alternative 1 would attenuate by the time noise reached any foraging murrelets, as they tend to forage farther offshore and away from human activity.

All other upland or overwater construction noise is expected to be significantly lower than estimated for pile installation. In addition, USCG and recreational boat traffic transit the area routinely, as do helicopter operations, and this baseline level of activity would not change significantly. Temporary increases in suspended sediment would likely occur during pile driving and anchor placement/removal; however, turbidity would be localized to the immediate in-water construction site and is not expected to impact prey availability for marbled murrelets. To further minimize potential impacts on foraging marbled murrelets, pile driving activity would begin two hours after sunrise and cease two hours before sunset during the portion of the in-water work window that overlaps the marbled murrelet nesting season (April 1 through September 23).

In addition, the Navy would comply with any requirements resulting from consultation with the USFWS.

With the implementation of minimization measures as well as implementation of the proposed compensatory mitigation for the loss of aquatic resources and treaty mitigation (see Section 2.6), no significant impacts on marbled murrelets would occur under Alternative 1.

Marine Mammals

Underwater Noise

Cetaceans may be exposed to behavioral disturbance if they were to come 2,070 feet (631 m), respectively, of a 30-inch diameter pile during impact pile driving (Table 3.3-7; Figures 3.3-7 and 3.3-8). This zones is confined within Port Angeles Harbor, and cetaceans are not likely to come into the harbor, as they are typically sighted farther offshore within the Strait of Juan de Fuca. However, harbor porpoises are small and cryptic, so they could be missed by monitors within the harbor. Therefore, some exposure of harbor porpoises to behavioral disturbance from pile driving could occur. Harbor porpoises are unlikely to occur close to construction, but if they occurred, marine mammal monitors would shut-down impact pile driving if harbor porpoises were within 150 m of pile driving.

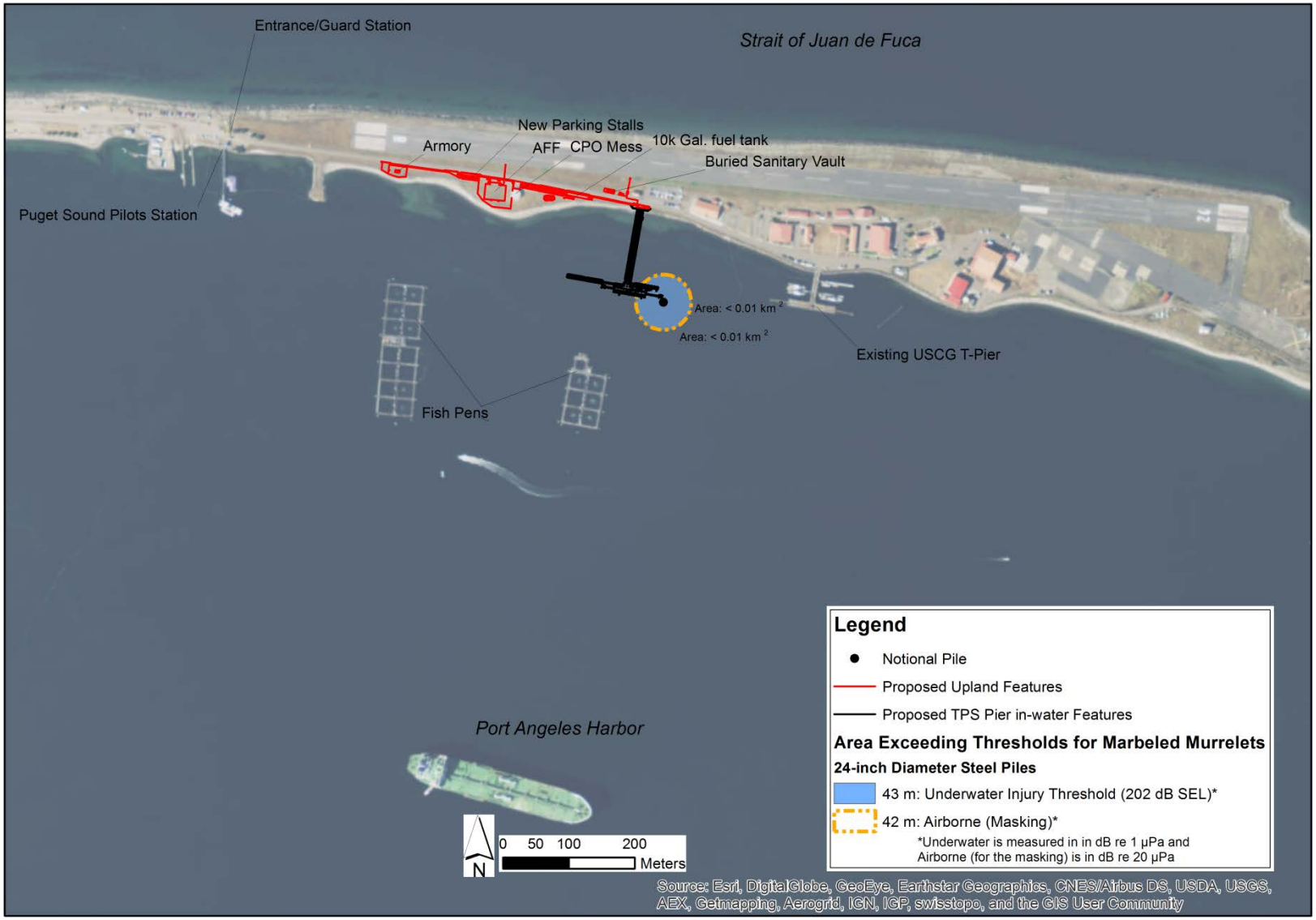

Figure 3.3-9. Representative View of Affected Areas for Marbled Murrelet from Underwater and Airborne (Masking) Noise due to Impact Pile Driving, 24-inch Diameter Steel Piles

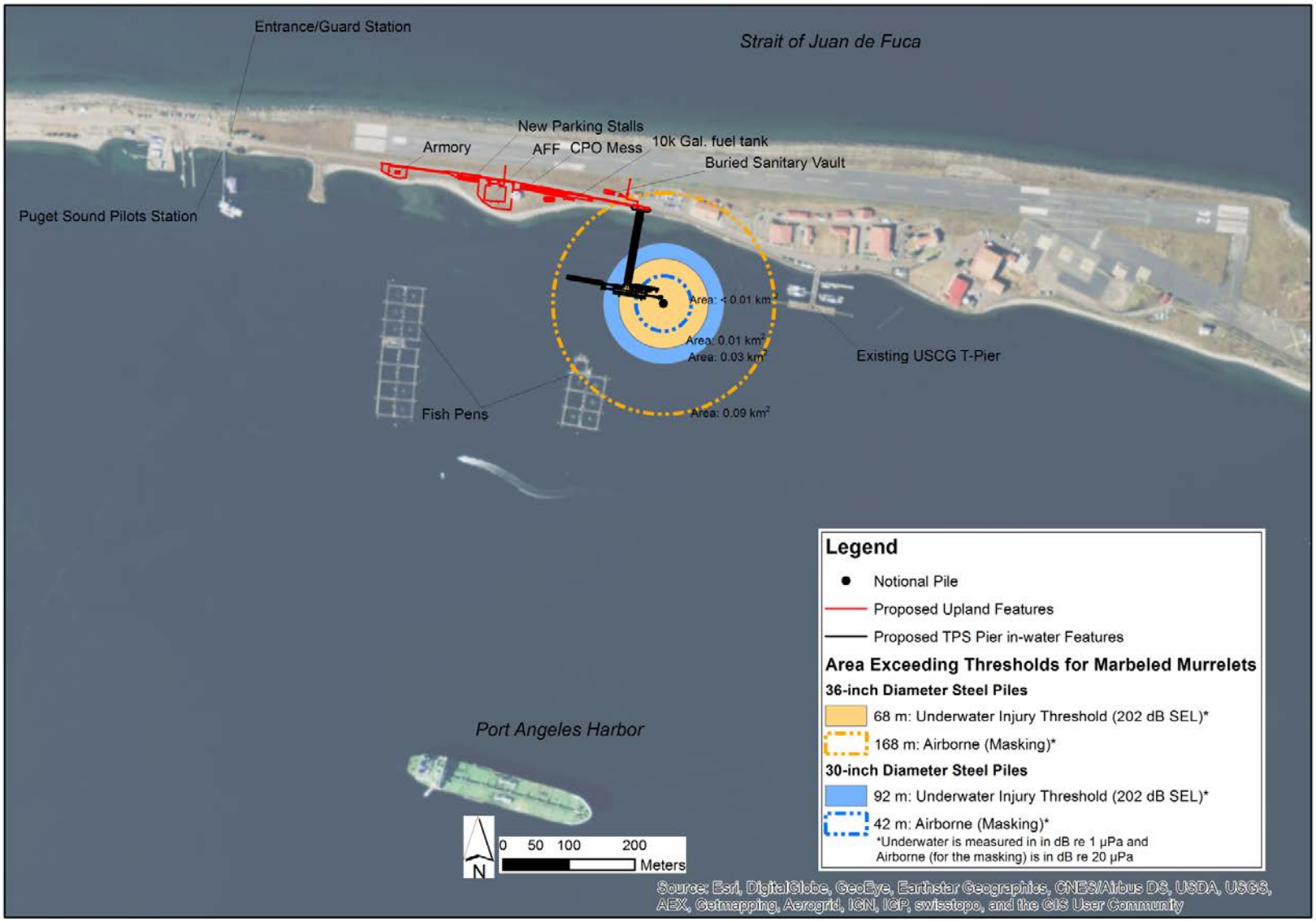

Figure 3.3-10. Representative View of Affected Areas for Marbled Murrelet from Underwater and Airborne (Masking) Noise due to Impact Pile Driving, 30/36-inch Diameter Steel Piles

Vibratory pile driving would create a larger zone, potentially exposing cetaceans to behavioral disturbance if they are transiting just outside of Port Angeles Harbor during vibratory pile driving activities. Although there are no recorded sightings of harbor porpoise in Port Angeles Harbor, they are one of the most frequently sighted cetaceans in the Salish Sea (Pacific Biodiversity Institute et al. 2013) and would be more likely to occur within the behavioral disturbance zone than other cetaceans.

Pinnipeds could be present during pile driving, particularly harbor seals as they are present within Port Angeles Harbor year round. Underwater exposure to noise would be injurious to a pinniped if it were to come within 20 feet (6 m) of impact pile driving of a 30-inch diameter pile (Table 3.3-7). The zone of behavioral disturbance during impact pile driving would be the same as that described above for cetaceans (Table 3.3-7). Sea lions may come into the area during construction but would be more likely to avoid the area and forage elsewhere during pile driving. To further protect pinnipeds, a shut-down measures for impact pile driving would be implemented if sea lions or seals occurred within 328 ft (100 m) of a pile being impact driven.

Given the duration of pile driving (approximately 75 days), there is a potential for short-term, temporary displacement of pinnipeds in the behavioral disturbance zones, but this is not anticipated to significantly affect their foraging behavior within the action area.

A Marine Mammal Monitoring and Mitigation Plan would be implemented during pile driving to protect all marine mammals from injury and would include mitigation measures to avoid marine mammal exposure to injurious noise levels generated from impact pile driving, and to reduce to the lowest extent practicable exposure to behavioral disturbance. The following measures are proposed:

- Acoustic Minimization Measures
  - Vibratory installation would be used to the extent possible to drive steel piles to minimize high SPLs associated with impact pile driving.
  - A bubble curtain or other noise-attenuation device would be employed during impact installation or proofing of steel piles.
- Soft Start
  - Provides a warning and/or gives animals in close proximity to pile driving a chance to leave the area prior to a vibratory or impact driver operating at full capacity, thereby exposing fewer animals to loud underwater and airborne sounds.
- Visual Monitoring and Shutdown Procedures
  - Behavioral disturbance and shutdown zones for Alternative 1 are presented in Table 3.3-7.
  - All impact pile driving would shut down if any marine mammal approaches an injury zone.
  - If harbor porpoise, Steller sea lion, California sea lion, northern elephant seal, or harbor seal (the Navy is requesting Level B take for these marine mammals) are present within the behavioral disturbance zone, pile driving would not need to be delayed. PSOs would monitor and document, to the extent practical, the behavior of marine mammals that remain in the zone.
  - If Southern Resident killer whale, humpback whale, minke whale, gray whale, killer whale, Dall's porpoise, Pacific white-sided dolphin, or other marine mammals for which the Navy does not have an IHA for are present within the behavioral disturbance zone, pile driving would be delayed. PSOs would monitor and document, to the extent practical, the behavior of marine mammals that remain in the zone.

- Visual monitoring will be conducted by qualified, trained marine mammal observers.
- If the shutdown zone is obscured by fog or poor lighting conditions, impact pile driving would not be initiated and would cease if already in progress until the entire shutdown zone is visible (i.e., the entire shutdown zone must be visible to the naked eye).

Airborne Noise

The nearest haul-out for harbor seals is on the west end of Ediz Hook, approximately 2 miles (3.2 km) away from the Alternative 1 site and on the Port of Port Angeles side of the harbor. However, harbor seals haul out on log booms closer to the project area. Harbor seals would experience behavioral disturbance from airborne noise levels if they were within 630 feet (192 m) of pile driving (Table 3.3-9; Figures 3.3-11 and 3.3-12).

Table 3.3-9. Calculated Distances to Pinniped Airborne Noise Thresholds during Impact Pile Driving – Alternative 1: Midwestern Site

Pile Size	Harbor Seal (90 dB RMS) (distance/area)	Sea Lions (100 dB RMS) (distance/area)
24 inches	152 m/0.07 km^2	48 m/0.007 km^2
30/36 inches	192 m/0.12 km^2	61 m/0.01 km^2

Notes: Source SPL from Navy (2014c). Sound level at which pinniped disturbance at haul-outs has been documented; not an official threshold – guidance only.

Sea lions are not common within Port Angeles Harbor, and the nearest haul-out is approximately 13 miles (20 km) north of the project area. Sea lions would potentially experience behavioral disturbance airborne noise levels within 200 feet (61 m) of impact pile driving (Table 3.3-9; Figures 3.3-11 and 3.3-12).

The Navy has applied for an IHA under the MMPA (Navy 2016) for behavioral disturbance to harbor porpoise, northern elephant seal, harbor seal, and sea lions. With implementation of the avoidance and minimization measures listed above and the request for take permit, no significant impacts on marine mammals would occur from underwater or airborne noise with implementation of Alternative 1.

Essential Fish Habitat

For the purposes of determining effects on EFH from Alternative 1 activities, the EFH Final Rule (NMFS 2002) and 50 CFR 600.910(a) were used as guidance.

Effects on EFH would include the same habitat effects as those described for listed salmonids that occur in the nearshore and marine areas, as described under the ESA-listed species and critical habitat section. Construction activities associated with Alternative 1 would affect fish habitat during in-water pile driving activities through bottom disturbance, localized increases in turbidity, a slight reduction in water quality, and temporarily elevated noise levels. These effects on EFH would be minimized by implementing the same avoidance and minimization measures as previously described for ESA-listed species.

Underwater noise, water column turbidity, temporary and permanent shading effects, and physical disruption from pile driving activities, work barges, and spud/anchoring systems during construction would create short-term disturbances in habitats used by coastal pelagic species and a long-term reduction in nursery habitat, localized to the project area.

Pile driving during construction would result in significant increases in water column noise in Port Angeles Harbor, where the threshold for injury and guideline behavioral response would be exceeded, leading to potential injury, mortality, or behavioral effects. Primary use of a vibratory

pile driver, use of an attenuation device during impact pile driving, and conducting pile driving during the in-water work window would avoid most effects on migrating Pacific Coast salmon

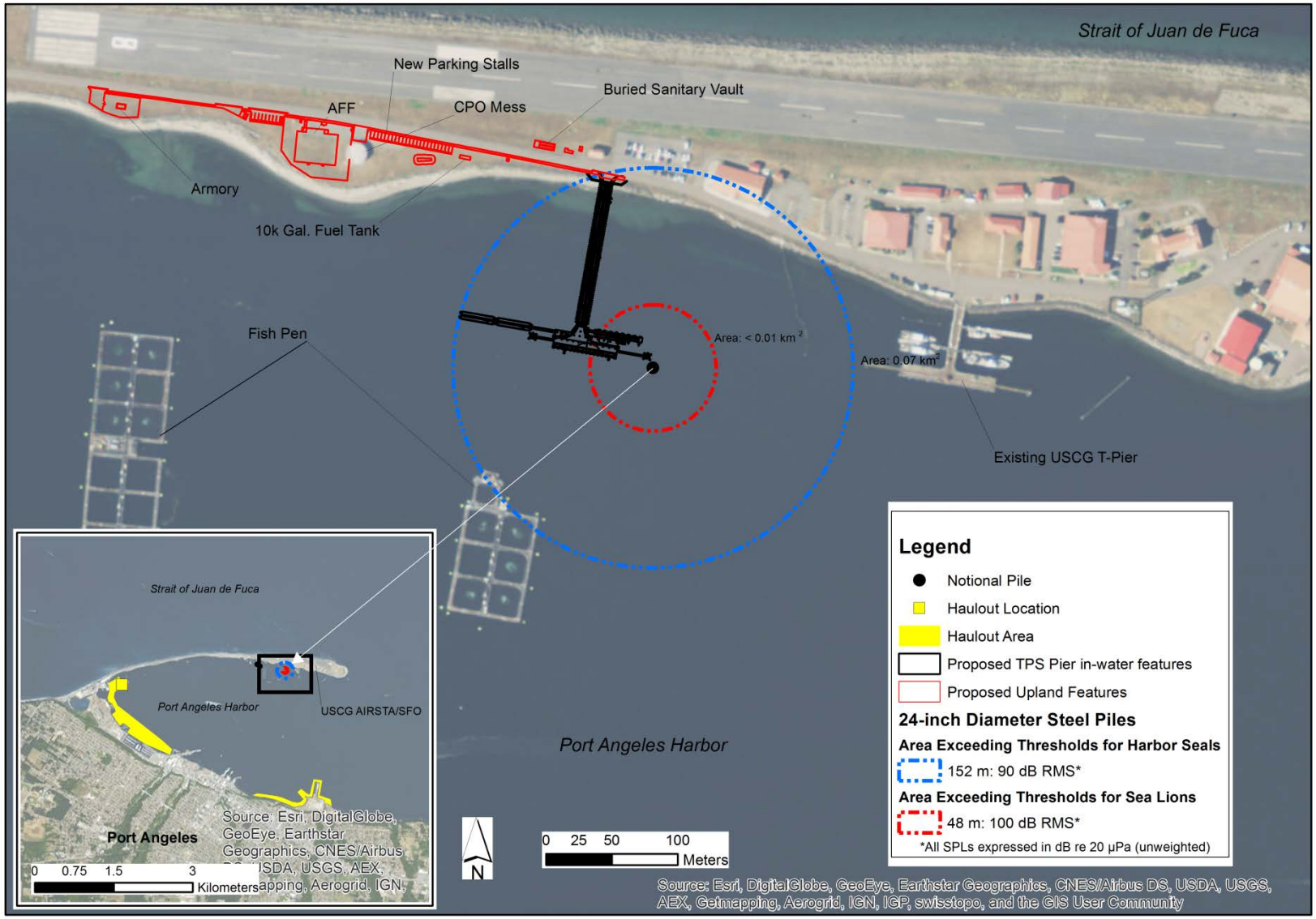

Figure 3.3-11. Representative View of Airborne Disturbance Areas for Harbor Seals and Sea Lions from Impact Pile Driving, 24-inch Diameter Steel Piles

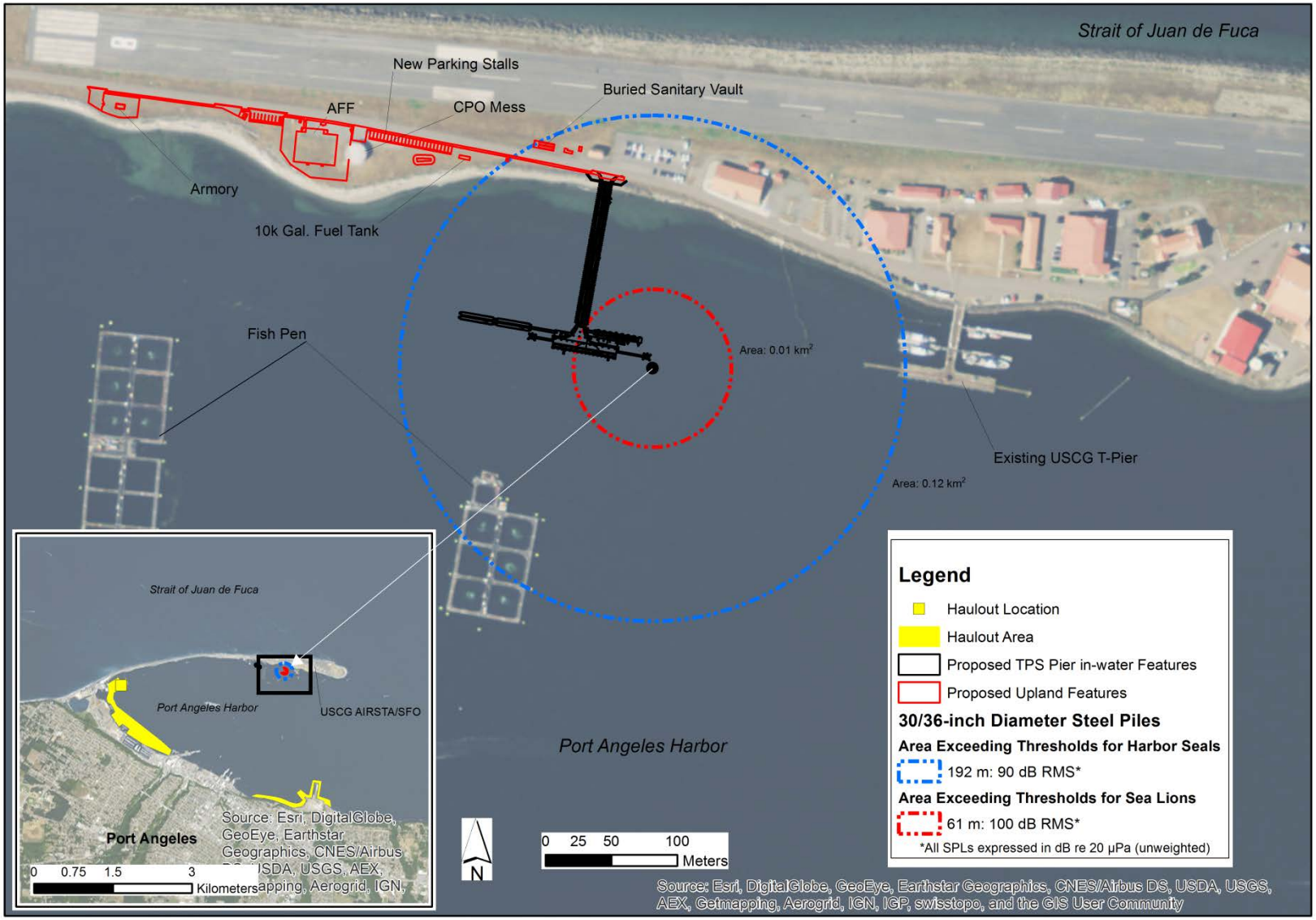

Figure 3.3-12. Representative View of Airborne Disturbance Areas for Harbor Seals and Sea Lions from Impact Pile Driving, 30/36-inch Diameter Steel Piles

EFH species. However, esonification of (i.e., noise within) the water column as a result of the pile driving activities would have an adverse effect on habitats designated as EFH for Pacific Coast salmon.

Long-term effects from the proposed TPS pier would result in 25,465 ft^2 (2,365 m^2) of total overwater coverage and 745 ft^2 (69 m^2) of displaced benthic habitat. The overwater coverage within the nearshore areas shallower than -30 feet (-9 m) MLLW (8,650 ft^2 [803 m^2]) would create permanent shade over existing eelgrass (HAPC for Pacific Coast salmon and Pacific Coast groundfish) within the proposed trestle footprint and reduce light penetration that may lead to a reduction in vegetation, prey, and refugia.

Findings pertaining to EFH habitats and federally managed species occurrence in waters within the Alternative 1 site are based on site-specific fish surveys, review of the life histories, habitat requirements, and potential conservation measures from the FMPs. The Navy concludes that implementation of Alternative 1 may adversely affect Pacific coast groundfish, coastal pelagic, and Pacific Coast salmon EFH. However, implementation of BMPs and project-specific measures would avoid and minimize adverse effects on EFH to the extent practicable. The increase of permanent shading from the proposed pier would be a long-term impact. With implementation of the proposed compensatory mitigation to minimize and offset the loss of aquatic resources within the proposed trestle footprint, as well as implementation of treaty mitigation, all other adverse effects would be short term, lasting only during the period of construction, and would cease upon completion of construction activities associated with Alternative 1.

Conclusion

Increased turbidity during in-water construction would result in temporary and localized impacts on marine fish (including ESA-listed species), benthic invertebrates, and EFH. Impact pile driving noise would expose adult ESA-listed salmonids and resident (non-migratory) fish to behavioral and injurious threshold levels. Noise at these levels would also impact PS Chinook ESU and bull trout designated critical habitat. Marine mammals would potentially be exposed to noise levels that could result in behavioral disturbance during pile driving. However, monitoring would preclude exposure to injurious noise levels for all marine mammals and behavioral disturbance for most whales and porpoises, including ESA-listed SRKW and humpback whales. Resulting overwater coverage and piles would result in the displacement of benthic habitat and a potential loss of approximately 4,595 ft^2 (427 m^2) of eelgrass. With the short duration of pile driving, temporary and localized turbidity, implementation of marine mammal monitoring, and proposed compensatory mitigation and treaty mitigation (see Section 2.6), no significant impacts would result under Alternative 1.

3.3.3.3 Alternative 2: Western Site

Birds

Similar to Alternative 1, the primary disturbance to birds under Alternative 2 would be noise generated during impact pile driving. Airborne noise levels from impact pile driving would be approximately 110 dBA re 20 µPa at a distance of 50 feet (15 m) from the pile, and noise levels from vibratory pile driving would be approximately 92 dBA re 20 µPa at a distance of 50 feet (15 m) from the pile. Under Alternative 2, other construction activities occurring in the absence of pile driving noise would be the same or similar to those under Alternative 1, and would likely utilize heavy machinery, trucks, or generators. Noise generated from these machines/trucks would create noise levels at approximately 94 dBA re 20 µPa at a distance of 50 feet (15 m)

from the activity, computed as the summation of noise of all equipment operating simultaneously (WSDOT 2015).

Multiple species of birds use the upland and shoreline areas of the project area, as well as the nearshore marine areas for resting, nesting, and foraging, and would likely be within the vicinity of Alternative 2 during proposed construction operations. The presence of construction activity and additional personnel in general would likely deter many birds from occurring within the immediate area. As described under Alternative 1, the attenuation distance to ambient noise levels for impact pile driving would be approximately 50,000 feet (15,240 m) but would likely not fully attenuate down to the ambient level of 52.1 dBA re 20 µPa due to industrial noise generated from the opposite side of the harbor at the Port of Port Angeles and the City of Port Angeles in general. As previously described, the upland areas of USCG AIRSTA/SFO Port Angeles offer very little suitable habitat for nesting. Thus, nesting activity, if it occurs, would be expected to be minimal. Noise may cause foraging, resting, and potentially nesting birds to temporarily avoid the area, but they would likely seek out other areas along the hook with very little behavioral disturbance anticipated. Further, pile driving activity would be short term and localized (15 pile driving days). The closest bald eagle nest site is approximately 3 miles(4.8 km) west of the Alternative 2 site, near the Port of Port Angeles (WDFW 2014b). As described under Alternative 1, the nests are located closer to industrial areas at the Port than to the project area, and nesting eagles have likely habituated to higher background noise levels than they would be exposed to from the proposed project. Therefore, no significant impacts on nesting birds, including nesting bald eagles, would occur as a result of noise.

Short-term and localized impacts on resting and foraging birds would likely occur during pile driving, as birds may seek out other nearby habitats but would likely return upon completion of the construction. Foraging bald eagles may also temporarily avoid the area within the immediate vicinity of pile driving; however, this is not expected to result in significant impacts on their foraging behavior or habitat availability. Construction could occur up to 5 days per week for one year and would not exceed 15 days of pile driving. No long-term impacts on birds, including bald eagles, would result post construction. Therefore, no significant impacts on birds would result with the implementation of Alternative 2.

Marine Vegetation

Marine vegetation (eelgrass, kelp, and algae) is present in the project area. The July 2015 survey documented a total of 49,693 ft^2 (4,616 m^2) of eelgrass occurring in discontinuous patches between -0.5 and -20 feet (-1.5 and -6 m) MLLW. Only small, discrete patches (less than 5 ft^2 [0.46 m^2]) were recorded within the footprint of the proposed trestle associated with Alternative 2, and none were recorded within the footprint of the proposed pontoon structure (SEE LLC 2015). Temporary impacts on eelgrass from proposed construction activities could occur from sediment turbidity during pile driving for the trestle and transfer span, as well as temporary shading from construction barges. Sediment turbidity would be temporary and localized to the pile locations, and barge anchoring or spudding, and overwater shading would be avoided in areas where eelgrass occurs.

The TPS pier would result in approximately 29,976 ft^2 (2,785 m^2) of total overwater coverage of which 1,780 ft^2 (165 m^2) would shade nearshore habitat areas shallower than -30 feet (-9 m) MLLW. The TPS pier would cover a portion of the underwater rock pile, resulting in permanent shade over other species of existing vegetation (e.g., kelp) and macroalgae within the affected footprint. The small, discrete patches of eelgrass recorded under the trestle footprint would likely die off. As described under Alternative 1, reduced light penetration from overwater coverage can lead to a reduction in aquatic vegetation (Haas et al. 2002). The loss of vegetation may result in

a loss of benthic invertebrates that utilize the area. However, this reduction would be localized to the 1,780 ft^2 (165 m^2) of the nearshore habitat shallower than -30 feet (-9 m) MLLW within the Alternative 2 site footprint. Proposed treaty mitigation (see Section 2.6) would be expected to create a net gain of 16,470 ft^2 (1,530 m^2) of unshaded nearshore marine habitat suitable for eelgrass colonization. With the implementation of the proposed treaty mitigation, no significant impacts on marine vegetation would result with the implementation of Alternative 2.

Marine Invertebrates and Fish

Underwater Noise

As with Alternative 1, construction activities associated with Alternative 2 would also result in a temporary increase in underwater noise levels in the project area. Noise would be generated from support vessels, small boat traffic, and barge-mounted cranes, but impact pile driving would have the greatest potential for affecting marine fish.

Under Alternative 2, large pile sizes (66-inch) would be required to support the floating pontoon. Because a bubble curtain or other attenuation device would be used to minimize the noise generated by driving steel piles, an expected attenuation of 7 dB (SPL) for 66-inch diameter piles and 8 dB for 24-inch diameter piles (as would be used under Alternative 1) was first subtracted from the source levels (Navy 2014c). As described in Section 2.4, proofing each pile would require up to 1,600 strikes. This noise analysis is based upon a maximum of 3,000 strikes per day for all piles under Alternative 2.

The underwater noise threshold criterion for fish injury from a single impact hammer pile strike (SPL of 206 dB PEAK re 1 µPa) would occur at a distance of approximately 16 feet (5 m) for a 24-inch pile (as described under Alternative 1) and 23 feet (7 m) for a 66-inch pile. Other applicable criteria for injury to fish would be 187 dB cumulative SEL 1 μPa^2*sec for a fish ≥2 g in weight and 183 dB cumulative SEL re 1 μPa^2*sec for a fish <2 g in weight (Table 3.3-10). Based on the 187 and 183 dB cumulative SEL 1 μPa^2*sec analysis, fish of both sizes occurring within a distance of approximately 1,118 feet (341 m) of a 24-inch (pile and 800 feet (244 m) from a 66-inch pile would be exposed to injurious effects. The behavioral disturbance area for fish for impact pile driving would be approximately two miles (3.4 km) from the largest pile (66 inches) (Table 3.3-10).

Table 3.3-10. Maximum Range to Fish Sound Criteria Thresholds from Pile Driving – Alternative 2: Western Site

Method and Pile Size	Criteria Threshold (distance/area)			
	206 dB PEAK (injury)	187 dB Cumulative SEL: fish ≥2g (injury)	183 dB Cumulative SEL: fish <2g (injury)	150 dB RMS (behavioral)
Impact pile driving				
24 inches	5 m/<0.01 km^2	341 m/0.25 km^2	341 m/0.25 km^2	2.5 km/9.8 km^2
66 inches	7 m/<0.01 km^2	243 m/0.15 km^2	341 m/0.25 km^2	3.4 km; 13.9 km^2
Vibratory pile driving				
24 inches	NA	NA	NA	63 m/0.01 km^2
66 inches	NA	NA	NA	341 m/0.25 km^2

Notes: NA = not applicable. All SPLs expressed in dB re 1 µPa; SEL are expressed in dB re 1 μPa^2*sec. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distance) used for calculations. Assumes 7-dB attenuation for 66-inch diameter piles and 8-dB attenuation for 24-inch diameter piles. Cumulative SEL calculated as single strike SEL + 10 * log (# of pile strikes); assumes 3 piles installed/day at 3,000 pile strikes/day.

Pile driving during the in-water work window (July 16 through February 15) would minimize impacts on juvenile salmonids but could still expose year-round resident juvenile fish species to

injurious and behavioral disturbance thresholds. Adult species would likely swim away and/or avoid the area in general with very little disturbance. Juvenile forage fish and groundfish would likely occur within the behavioral or injury zones during pile driving, as they inhabit the underwater rock pile within the proposed TPS pier footprint, and sand lance spawning (November to mid-February) coincides with the in-water work window. These fish would be exposed to injurious and behavioral noise impacts that could cause injury to or death of these fish.

To minimize underwater noise impacts during pile driving, the majority of pile driving activity would be conducted using a vibratory pile driver, with impact pile driving only occurring to proof piles or under hard substrate conditions. All pile driving would require no more than 15 days to complete during a single in-water work season, with an estimated duration of impact pile driving ranging from several minutes to a maximum of 4 hours per day for up to 15 days. A bubble curtain would be used to attenuate underwater noise during impact pile driving. In addition, the bubble curtain would be turned on prior to initiation of pile strikes and would likely flush fish away from the injury zone near the pile. Impacts from noise disturbance would be short term and localized.

Turbidity

Similar to Alternative 1, there would be temporary increases of suspended sediment during pile driving and barge anchor placement/removal. Increased turbidity would be localized to the pile footprint and would be expected to settle out relatively quickly for coarser substrates and longer suspension times for finer substrates. However, turbidity would not exceed a duration of 15 days total of pile driving. Benthic organisms may be damaged, buried, or experience reduced foraging ability, but these impacts would be on species occurring within the localized area of the pile installation.

Physical Barriers and Overwater Shade

As described under Alternative 1, in-water construction would affect benthic organisms through bottom disturbances from pile driving and anchor placement/removal. Less benthic habitat would be displaced as compared to Alternative 1, as there would be approximately 209 ft^2 of benthic habitat lost as well as the loss of existing benthic species within the pile footprint. However, disturbance would be localized and would not significantly impact existing benthic species, their habitat, or benthic prey availability for juvenile fish.

Upon completion of the 29,976 ft^2 (2,785 m^2) TPS pier, 1,780 ft^2 (165 m^2) of nearshore habitat shallower than -30 feet (-9 m) MLLW would be shaded and would also shade a portion of the existing rock pile that provides vegetation, prey, refugia, and EFH. Long-term shade created from the new overwater structure would reduce vegetation, leading to a reduction in refugia (i.e., vegetated cover and interstitial spaces in rocks) used by juvenile fish, a reduction in juvenile prey species, and a change in the species composition of the area to favor more shade-preferring species. As described under Alternative 1, the TPS pier would cast shadows, creating a light/dark interface that allows prey to become more susceptible to ambush predators that remain in darkened areas (Helfman 1981) and would potentially alter juvenile salmon migration (Kahler et al. 2000; Ono et al. 2010). This reduction in and change to habitat would be localized to the TPS pier footprint of the Alternative 2 site and would not significantly reduce vegetation and invertebrate communities within the action area. In addition, proposed treaty mitigation as described in Section 2.6 would provide approximately 16,470 ft^2 (1,530 m^2) of new unshaded nearshore habitat. Because the proposed compensatory mitigation site encompasses a portion of the Alternative 2 project area, appropriate compensatory mitigation to offset impacts on

aquatic resources would need to be developed with the USACE should this alternative be selected.

Avoidance and minimization measures identified in Section 2.5 include the following:

- Avoiding long-term shading of existing eelgrass from barges.
- Avoiding spudding or anchoring within eelgrass.
- Conducting in-water work from July 16 through February 15 to avoid juvenile salmonids.
- Using a bubble curtain during impact pile driving.

With the implementation of these avoidance and minimization BMPs and measures, no significant impacts on marine vegetation, marine fish, or invertebrates would result with the implementation of Alternative 2.

Special Status Species

ESA-listed Species and Critical Habitat

Fish Species

Impacts described above for fish would apply to the ESA-listed PS Chinook ESU, PS steelhead DPS, HC chum ESU, bull trout, southern eulachon DPS, and southern green sturgeon DPS. Underwater noise levels above established impact thresholds for fish would occur during impact pile driving activities and would last approximately 15 days. As stated under Alternative 1, pile driving would occur during the in-water work window to minimize and avoid impacts on juvenile salmonids. However, small numbers of juvenile Chinook and chum may be present during the in-water work window and potentially exposed to injurious noise levels. Resident and returning Chinook, returning summer-run chum, and steelhead that occur within the harbor could also be present during in-water construction. These fish would not be protected by the work windows, although the majority exposed would be larger in size, would not be nearshore dependent, and would not be expected to remain in the work area for any extended period of time. These fish would still be exposed, temporarily, to injurious levels of underwater sound, as the injurious threshold zone during impact pile driving would extend out into deeper water. The southern green sturgeon and eulachon DPSs occur farther offshore within the Strait of Juan de Fuca and are not expected to be present in the project area. Therefore, impacts on these species from in-water construction are not expected.

The ESA-listed fish species listed above would not be significantly impacted by in-water construction. The completion of the TPS pier would result in overwater shade that could potentially impact juvenile ESA-listed salmon through prey and habitat reduction and alteration of migration behavior. However, these potential impacts would be localized to 1,780 ft^2 (165 m^2) of the nearshore habitat shallower than -30 feet (-9 m) MLLW and would not significantly impact juvenile ESA-listed salmonids within the action area.

As previously described, the PS Chinook salmon ESU, bull trout, and southern green sturgeon DPS have designated critical habitat within the action area. Small numbers of nearshore-dependent juvenile PS Chinook salmon could be present in the area during the in-water work window; exposure to injurious noise levels would occur for the nearshore PCE during construction. Adult PS Chinook occurring within the offshore marine areas of the harbor, as well as bull trout migrating through the area, would likely be exposed temporarily to injurious noise levels that extend offshore over deeper water, impacting the offshore PCE for PS Chinook salmon ESU and migrating habitats PCE for bull trout. Impacts on the water quality and food resources PCEs for southern green sturgeon DPS would be insignificant, as sturgeon have not been observed in the harbor but more likely would occur within the Strait of Juan de Fuca,

outside of any injurious or behavioral noise disturbance. Further, their rare occurrence in the harbor makes it unlikely they would regularly forage in the harbor. Therefore, there would be no impacts on southern green sturgeon DPS water quality (i.e., noise and turbidity) or food resource PCEs.

The completion of the TPS pier would create overwater shade that could potentially impact juvenile ESA-listed salmon through prey and habitat reduction and the alteration of juvenile migration behavior. However, these potential impacts would be localized to 1,780 ft^2 (165 m^2) of nearshore habitat that would be shaded and would not significantly impact juvenile ESA-listed salmonids within the action area. The nearshore PCE for the PS Chinook salmon ESU and abundant food base PCE for bull trout may be affected through the addition of barriers (piles) and shade. However, the new TPS pier would be localized to the Alternative 2 footprint (within 29,976 ft^2 [2,785 m^2] of total overwater coverage) and would have no significant impact on designated critical habitat PCEs in the action area.

Avoidance and minimization measures identified in Section 2.5 include the following:

- Conducting in-water work from July 16 through February 15 to avoid juvenile salmonids.
- Using a bubble curtain for attenuation during impact pile driving.

With the implementation of these avoidance and minimization measures, as well as implementation of treaty mitigation, there would be temporary and short-term impacts on ESA-listed salmonids and designated critical habitat, but no significant long-term impacts would result under Alternative 2.

Southern Resident Killer Whale

SRKW would be exposed to injurious effects from impact pile driving if they were to occur within 72 feet (22 m) of a 24-inch pile being installed via impact pile driver, or within 111 feet (34 m) of a 66-inch pile installed using an impact pile driver (Table 3.3-11). Marine mammal monitoring would shut down pile driving if SRKWs approach the much larger behavioral disturbance zone. In addition, SRKW would be rare in the area and pile driving would only occur for up to 75 days.

Table 3.3-11. Calculated Distances to Underwater Marine Mammal Noise Thresholds during Pile Driving – Alternative 2: Western Site

Method Pile Size	Injury – Pinnipeds 190 dB RMS (distance/area)	Injury – Cetaceans 180 dB RMS (distance/area)	Behavioral Disturbance (Impact) – 160 dB RMS (distance/area)	Behavioral Disturbance (Vibratory) – 120 dB RMS (distance/area)
Impact Pile Driving				
24 inches	5 m/<0.1 km^2	22 m/<0.01 km^2	464 m/0.4 km^2	NA
66 inches	7 m/<0.01 km^2	34 m/<0.01 km^2	736 m/1.0 km^2	NA
Vibratory Pile Driving				
24 inches	NA	NA	NA	6.3 km/20.4 km^2
66 inches	NA	NA	NA	10.3 km/22.3 km^2

Notes: NA = Not Applicable; Assumes 8 dB attenuation for 24-inch diameter piles and 7 dB attenuation for 66-inch diameter piles. All source levels relative to 1 µPa. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distance) used for calculations.

There is a potential for behavioral disturbance within the 120-dB zone for vibratory pile driving, as it encompasses a larger area within the action area (Port Angeles Harbor and extending out to the east) (Table 3.3-11). As previously described under Alternative 1, pile driving noise is not expected to result in behavioral disturbance of SRKW because they are unlikely to be present in

the affected area and there are no reported sightings of SRKW in Port Angeles Harbor. Further, monitoring and shutdown zones would be implemented to avoid disturbance.

SRKW critical habitat is designated within Port Angeles Harbor in waters deeper than 20 feet (6 m). No significant impacts on critical habitat PCE for prey would occur, as pile driving would last a maximum of 15 days and occur during the in-water work window, when juvenile salmonids (prey) are least likely to be present. In addition, the passage of killer whales may occur just outside the farthest extent of the 120-dB behavioral zone (Table 3.3-11), but their presence would only be short term and temporary and, therefore, no impacts are expected.

Humpback Whale

As previously mentioned, there are no recorded sightings of humpback whales within Port Angeles Harbor. The nearest sightings to the action area have been within the deep waters of the Strait of Juan de Fuca.

Avoidance and minimization measures listed in Section 2.5 include the following:

- During impact pile driving, visual monitoring would be conducted for the 160-dB RMS behavioral disturbance zone of 2,414 feet (736 m). Pile driving would cease should a humpback whale approach the behavioral disturbance zone.
- During vibratory pile driving, visual monitoring of the 120-dB RMS behavioral disturbance zone of 6.4 miles (10.3 km) would be conducted. Pile driving would cease should a humpback approach the behavioral disturbance zone.
- A bubble curtain would be used during impact pile driving.

With the implementation of these avoidance and minimization measures and BMPs, no significant impacts on SRKW and humpback whales would result with the implementation of Alternative 2.

Marbled Murrelet

Under Alternative 2, the underwater auditory injury threshold (cumulative SEL = 202 dB) is estimated to extend 141 feet (43 m) during impact pile driving of a 24-inch diameter pile, and 79 feet (24 m) during 66-inch diameter pile driving (Table 3.3-12). Marbled murrelets could be exposed to injurious noise levels if they were at or within 141 feet (43 m) of a 24-inch pile or within 79 feet (24 m) of a 66-inch pile during impact pile driving after all strikes were completed.

Table 3.3-12. Maximum Range to Marbled Murrelet Underwater Injury and Airborne Masking Sound Threshold from Impact Pile Driving – Alternative 2: Western Site

Steel Pile Size	Underwater Injury Threshold: 202 dB SEL (distance/area)	Airborne (Masking) (distance/area)
24 inches	43 m/<0.01 km^2	42 m (<0.01 km^2)
66 inches	24 m/<0.01 km^2	168 m (0.09 km^2)

Notes: Assume 7dB attenuation. All SPLs expressed in dB re 1 µPa; SEL are expressed in dB re 1 μPa^2*sec. Practical spreading loss model (15 log R, or 4.5 dB per doubling of distanced) used for calculations. Cumulative SEL calculated as single strike SEL + 10 * log (# of pile strikes) and assumes 6,000 pile strikes/day for 24-inch diameter piles and 3,000 pile strikes/day for 66-inch diameter piles.
Sources: Caltrans 2012; Navy 2014c.

As described under Alternative 1, airborne pile driving noise has the potential to affect foraging behavior and efficiency through masking effects (SAIC 2012). The distance to the marbled murrelet airborne masking threshold is set at a radius of 138 feet (42 m) from an impact driven pile less than 36 inches in diameter (Table 3.3-5). In addition, for the larger 66-inch piles, the

masking threshold would be 550 feet (168 m) from the pile. All other construction noise associated with Alternative 2 would attenuate by the time noise reached any foraging murrelets foraging offshore.

All other upland or overwater construction noise, as described under Alternative 1, would be similar under Alternative 2. Temporary increases in suspended sediment would also result during pile installation and pile placement, but turbidity would be localized to the immediate in-water construction site and not expected to impact prey availability for marbled murrelets. To further minimize potential impacts on foraging marbled murrelets, pile driving activity would begin 2 hours after sunrise and cease 2 hours before sunset during the portion of the in-water work window that overlaps marbled murrelet nesting season (April 1 through September 23). In addition, the Navy would comply with requirements resulting from consultation with the USFWS.

With the implementation of minimization measures and the implementation of treaty mitigation (see Section 2.6), no significant impacts on marbled murrelets would occur under Alternative 2.

Marine Mammals

Underwater Noise

Exposure of cetaceans to the behavioral disturbance zone would be encountered within 1,522 feet (464 m) of a 24-inch pile and within 2,415 feet (736 m) of a 66-inch pile during impact pile driving. These zones are confined within Port Angeles Harbor. As described under Alternative 1, cetaceans are not likely to come into the harbor but are more commonly sighted farther offshore in the Strait of Juan de Fuca. However, harbor porpoises are small and cryptic, so they could be missed by monitors within the harbor. Therefore, some exposure of harbor porpoises to behavioral disturbance from pile driving could occur under Alternative 2. Harbor porpoises are unlikely to occur close to construction, but if they occurred, marine mammal monitors would shut-down impact pile driving if harbor porpoises were within 150 m of pile driving.

Vibratory pile driving would create a larger zone potentially exposing cetaceans to behavioral disturbance if they are transiting just outside of Port Angeles Harbor during vibratory pile driving activities. As previously stated, harbor porpoise are one of the most frequently sighted cetaceans in the Salish Sea, but there are no recorded sightings of them in Port Angeles Harbor (Pacific Biodiversity Institute et al. 2013). Harbor porpoises would be more likely to occur within the behavioral disturbance zone than other cetaceans.

Pinnipeds, particularly year-round resident harbor seals, could be present during pile driving. Underwater exposure to noise would be injurious to a harbor seal or sea lion if it were to come within 16.5 feet (5 m) of a 24-inch pile or 23 feet (7 m) of a 66-inch pile during impact pile driving. The zone of behavioral disturbance during impact pile driving would be the same as that described above for cetaceans (Table 3.3-11). Sea lions may come into the area during construction but would be more likely to avoid the area and forage elsewhere during pile driving. Given the short duration of pile driving (approximately 15 days), there would be no significant impacts on pinnipeds within the action area. To further protect pinnipeds, shut-down measures for impact pile driving would be implemented if sea lions or seals occurred within 328 ft (100 m) of a pile being impact driven.

A Marine Mammal Monitoring and Mitigation Plan would be implemented during pile driving to protect all marine mammals from injury. Proposed measures would be similar to those outlined for Alternative 1, except the geographic extent and distances for the behavioral disturbance and shutdown zones are different for Alternative 2, as presented in Table 3.3-11.

Airborne Noise

As described under Alternative 1, harbor seals have been observed hauled out on the west end of Ediz Hook, approximately 2 miles (3.2 km) west of the Alternative 2 site, but have also been observed on log booms near the project area. Harbor seals would experience behavioral disturbance from airborne noise levels if they were within 500 feet (152 m) of pile driving (Table 3.3-13).

Table 3.3-13. Calculated Distances to Pinniped Airborne Noise Thresholds during Impact Pile Driving – Alternative 2: Western Site

Pile Size	Harbor Seal (90 dB RMS) (distance/area)	Sea Lion (100 dB RMS) (distance/area)
24 inches	152 m/0.07 km^2	48 m/<0.01 km^2
66 inches	15 m/<0.01 km^2	17 m/<0.01 km^2

Notes: Sound level at which pinniped disturbance at haul-outs has been documented; not an official threshold – guidance only.
Sources: Laughlin 2011; Navy 2014c.

Sea lions are not common within Port Angeles Harbor and the nearest haul-out is approximately 13 miles (20 km) north of the project area. Sea lions would potentially experience behavioral disturbance airborne noise levels within 158 feet (48 m) of a 24-inch pile and 56 feet (17 m) of a 66-inch pile during impact pile driving (Table 3.3-13). However, they are not typically observed within Port Angeles Harbor and likely would not be hauled out within these zones during the 15 days of pile driving.

The Navy has applied for an IHA under the MMPA (Navy 2016) for behavioral disturbance to harbor porpoises, northern elephant seals, harbor seals, and sea lions. With implementation of the avoidance and minimization measures listed above and request for take permit, no significant impacts on marine mammals would occur from underwater or airborne noise with implementation of Alternative 2.

Essential Fish Habitat

Effects on EFH would include the same habitat effects described for listed salmonids that occur in the nearshore and marine areas, as discussed in the ESA-listed species and critical habitat section. Construction of Alternative 2 would affect fish habitat during in-water pile driving activities through bottom disturbance, localized increases in turbidity, a slight reduction in water quality, and temporary elevated noise levels. These effects would be minimized by implementing conservation measures designed to protect ESA-regulated species, which would similarly protect and conserve Pacific Coast groundfish EFH, coastal pelagic species EFH, and Pacific Coast salmon EFH.

Underwater noise, water column turbidity, temporary and permanent shading effects, and physical disruption from pile driving activities, work barges, and spud/anchoring systems during construction would create short-term disturbances in habitats used by coastal pelagic species.

Pile driving during construction would result in significant increases in water column noise in Port Angeles Harbor where the threshold for injury and guideline behavioral response would be exceeded, leading to potential injury, mortality, or behavioral effects. Primary use of a vibratory pile driver, use of an attenuation device during impact pile driving, and conducting pile driving during the in-water work window would avoid most effects on migrating Pacific Coast salmon EFH species. However, esonification of the water column as a result of the pile driving activities would have an adverse effect on habitats designated as EFH for Pacific Coast salmon.

Long-term effects from the proposed TPS pier would result in 29,976 ft^2 (2,785 m^2) of total overwater coverage and 209 ft^2 (19 m^2) of displaced benthic habitat. The overwater coverage from the trestle would create 1,780 ft^2 (165 m^2) of permanent shade within the nearshore area and over a portion of the underwater rock pile that is currently used as nursery habitat for groundfish, notably juvenile rockfish and HAPC (eelgrass) for Pacific Coast salmon and groundfish. Although eelgrass does not occur within the footprint of the pontoon, small discrete patches totaling less than 5 ft^2 (0.46 m^2) that occur within the nearshore would be lost within the footprint of the trestle. The reduction of light penetration over the rock pile from the proposed trestle and pontoon structure would cause a reduction in vegetation, prey, and refugia. Implementation of the proposed treaty mitigation described in Section 2.6 would provide approximately 23,900 ft^2 (2,220 m^2) of new unshaded nearshore habitat. Because the proposed compensatory mitigation site encompasses a portion of the Alternative 2 project area (16,800 ft^2 [1,561 m^2] of nearshore habitat created with jetty removal), appropriate compensatory mitigation to offset impacts on aquatic resources would need to be developed with the USACE should this alternative be selected.

The Navy concludes that implementation of Alternative 2 may adversely affect Pacific coast groundfish, coastal pelagic, and Pacific Coast salmon EFH. However, implementation of BMPs and project-specific measures would avoid and minimize adverse effects on EFH to the extent practicable. The increase of permanent shading from the proposed pier would be a long-term impact. With implementation of treaty mitigation to minimize and offset the loss of aquatic resources within the footprint, all other adverse effects would be short term, lasting only during the period of construction, and would cease upon completion of construction activities associated with Alternative 2.

Conclusion

Increased turbidity during in-water construction would result in temporary and localized impacts on marine fish (including ESA-listed species), benthic invertebrates, and EFH. Impact pile driving would expose adult ESA-listed salmonids and resident (non-migratory) fish to behavioral and injurious threshold noise levels. These noise levels would also impact PS Chinook ESU and bull trout designated critical habitat. Marine mammals would potentially be exposed to noise levels that could result in behavioral disturbance during pile driving. However, monitoring would preclude exposure to injurious noise levels for all marine mammals and behavioral disturbance for most whales and porpoises, including ESA-listed SRKW and humpback whales. Resulting overwater coverage and piles would result in the displacement of benthic habitat, a potential loss of approximately 5 ft^2 (0.46 m^2) of eelgrass, and permanent loss of EFH due to coverage of the rock pile. With the short duration of pile driving, temporary and localized turbidity, implementation of marine mammal monitoring, and proposed treaty mitigation (see Section 2.6), no significant impacts would result under Alternative 2.

3.3.3.4 Alternative 3: Eastern Site

Birds

Potential impacts on birds under Alternative 3 would be similar to those previously described under Alternatives 1 and 2, although there would be differences associated with the location of proposed upland facilities. Existing areas within the construction footprint that are used as resting or foraging habitat may be permanently affected. However, construction would be localized to the eastern end of Ediz Hook and would not impact other areas along the hook where birds could forage, nest, or rest. The bald eagle nesting period would coincide with pile driving, but as previously described under the other action alternatives, the nests are a significant distance away (3 miles [5 km]) and are located near an industrial area where eagles

have likely acclimated to higher baseline noise levels. Further, pile driving noise would be localized and temporary and would occur for no more than 25 days. With the implementation of avoidance and minimization measures, no significant impacts on birds would occur with the implementation of Alternative 3.

Marine Vegetation

A total of 47,909 ft^2 (4,451 m^2) of eelgrass was recorded within the Alternative 3 site during the July 2015 surveys. Temporary shading and turbidity impacts would likely occur during construction of the TPS pier, but these would be minimized to 25 days during pile installation. It is expected that there would be an increase in suspended sediments (turbidity) during the installation of the H-piles for the wave attenuation screen. However, turbidity would likely be localized to the wave attenuation screen footprint and would not impact the nearshore eelgrass and other submerged aquatic vegetation. Eelgrass is not present within the footprint of the proposed wave attenuation screen. The proposed approach trestle and pier would permanently cover approximately 15,233 (1,415 m^2) of eelgrass that occurs in a narrow intertidal band between approximately -1.5 to -19 feet MLLW. To minimize additional long-term impacts on eelgrass, the proposed pontoon would be oriented in a configuration directed offshore and away from existing eelgrass occurring adjacent to the approach trestle footprint. By implementing design, avoidance, and minimization measures to include pontoon configuration and only short-term shading of eelgrass (if necessary) during construction, short-term impacts on eelgrass would be minimized. In addition, implementation of proposed compensatory mitigation and treaty mitigation would provide approximately 34,200 ft^2 (3,177 m^2) of new unshaded nearshore habitat to minimize and offset the loss of aquatic resources from the TPS pier (see Section 2.6). Therefore, no significant net impacts on marine vegetation would result from the implementation of Alternative 3.

Marine Invertebrates and Fish

Potential impacts on marine invertebrates and fish under Alternative 3 would be similar to those previously described under Alternative 2. The difference from Alternative 2 is that there would be additional piles required to install the wave attenuation screen at the Alternative 3 site. Areas encompassing the injury and behavioral thresholds from impact pile driving would be the same as those under Alternative 2 but located on the opposite end of Ediz Hook. Because all pile driving would occur within the in-water work window, juvenile salmonids would likely not be present within the areas exposed to injury and behavioral thresholds from impact pile driving. In addition, a bubble curtain would be used to attenuate noise during impact pile driving. Turbidity from suspended sediment would be slightly greater than under Alternative 2 due to the greater number of piles that would be installed. However, turbidity would be localized to the Alternative 3 site and would likely subside in minutes to hours following completion of pile driving activity, or would be circulated out into the Strait of Juan de Fuca. Pile driving would require approximately 25 days, as more piles would need to be installed under this alternative to accommodate the wave attenuation screen.

Invertebrates within the footprint of the piles would be exposed to temporarily increased turbidity levels, and those that are less mobile may be inadvertently destroyed during pile driving. However, this would not be a significant loss of invertebrates, as the area affected (218 ft^2 [20 m^2]) is small in comparison to the total extent of benthic habitat present at the project area and in Port Angeles Harbor in general. Resulting overwater coverage would be 33,136 ft^2 (3,078 m^2), which is 3,160 ft^2 (293 m^2) larger than the coverage under Alternative 2. However, substrates at the Alternative 3 site are not hard like those at the Alternative 2 site. This area is composed of more consistent, soft-bottomed substrate, inhabited by mobile invertebrates, with

little rocky substrate for less mobile invertebrates to attach to and remain (Berger Abam 2014). Thus, impacts on invertebrates would be less under Alternative 3 than under the other alternatives, and Alternative 3 would not significantly impact fish or invertebrate populations within the action area.

Avoidance and minimization measures and BMPs identified in Section 2.5 include the following:

- Avoiding shading of existing eelgrass from barges.
- Avoiding of spudding or anchoring within eelgrass.
- Conducting in-water work from July 16 through February 15 to avoid juvenile salmonids.
- Using a bubble curtain during impact pile driving.

With the implementation of these measures and proposed compensatory mitigation and treaty mitigation (see Section 2.6), no significant impacts on marine invertebrates and fish would result under Alternative 3.

Special-Status Species

ESA-Listed Fish and Designated Critical Habitat

Potential impacts on ESA-listed fish and designated critical habitat under Alternative 3 would be similar to those previously described under Alternative 2. Compared to Alternative 2, more pile driving days would be required for Alternative 3, as more piles would be needed to accommodate the wave attenuation screen. The number of pile driving days would not likely exceed 25 days under Alternative 3. Although the in-water work window avoids a majority of juvenile salmonids, small numbers of juvenile chum and Chinook could be present during pile driving and exposed to injurious noise levels. Further, adult ESA-listed salmonids may be potentially exposed to injurious noise levels temporarily, as these levels extend out into the deeper water. Southern green sturgeon and Pacific eulachon DPSs may be present in the Strait of Juan de Fuca and potentially within the behavior noise disturbance zone for impact pile driving. However, behavioral disturbance to these species would likely be limited to short-term impacts to fish passing through the area. Hence no significant impacts on green sturgeon or eulachon would occur.

As described under Alternative 2, small numbers of nearshore-dependent juvenile PS Chinook salmon could be present in the area during the in-water work window. Therefore, injurious noise levels would occur in the nearshore PCE during construction. Adult PS Chinook occurring within the offshore marine areas of the harbor, as well as bull trout migrating through the area, would likely be exposed temporarily to injurious noise levels that extend offshore over deeper water, impacting the offshore PCE for PS Chinook salmon ESU and the migrating habitat PCE for bull trout. Impacts on the water quality PCE for green sturgeon would be short term and temporary, and limited to exposure to noise levels that exceed behavioral disturbance thresholds by fish passing by the area at the time of pile driving. Given that southern green sturgeon are rare in the harbor and are unlikely to regularly forage in the harbor, there would be no significant impact on the food resource PCE for the southern green sturgeon DPS.

The TPS pier would create barriers and shade that could potentially impact prey and habitat availability as well as alter juvenile ESA-listed salmon migration behavior. However, these impacts would be localized to the nearshore area shallower than -30 feet (-9 m) MLLW (33,136 ft^2 [3,078 m^2] overwater coverage) and would not significantly impact prey and habitat availability or significantly alter juvenile migration behavior within the action area. The nearshore PCE for the PS Chinook salmon ESU and abundant food base PCE for bull trout may be

affected through the addition of barriers (piles) and shade, but would be localized to the 33,136 ft^2 (3,078 m^2) nearshore overwater coverage footprint.

Avoidance and minimization measures identified in Section 2.5 include the following:

- Conducting in-water work from July 16 through February 15 to minimize impacts on juvenile salmonids.
- Using a bubble curtain for attenuation during impact pile driving.

With the implementation of these avoidance and minimization measures and BMPs as well as implementation of proposed compensatory mitigation and treaty mitigation, there would be temporary and short-term impacts on ESA-listed salmonids and designated critical habitat, but no significant long-term impacts would result under Alternative 3.

Marbled Murrelet

The underwater and airborne noise (masking) threshold distances would be the same as those described under Alternative 2, except the areas of exposure would be located on the eastern end of Ediz Hook. Additional pile driving would be required under Alternative 3 to accommodate the wave attenuation screen, but pile driving days would not exceed 25. All upland construction noise and in-water turbidity impacts would be the same as those described under Alternative 2 and would be temporary and localized to the TPS pier footprint. No significant impacts on foraging marbled murrelets or their prey would result.

To further minimize potential impacts on foraging marbled murrelets, pile driving activity would begin 2 hours after sunrise and cease 2 hours before sunset during the portion of the in-water work window that overlaps with the marbled murrelet nesting season. In addition, the Navy would comply with requirements resulting from consultation with the USFWS.

With the implementation of minimization measures, as well as the implementation of proposed compensatory mitigation and treaty mitigation (see Section 2.6), no significant impacts on marbled murrelets would occur under Alternative 3.

Marine Mammals

Under Alternative 3, impacts on ESA-Listed and MMPA-protected marine mammals would be similar to those described under Alternative 2. Under Alternative 3, however, the piles and the proposed TPS pier would be located on the eastern end of Ediz Hook. In addition, a wave attenuation structure would be installed. However, all distances to noise threshold zones would be the same as under Alternative 2 (Table 3.3-11 and Table 3.3-13). Pile driving would occur at the end of the hook, and thus the injury zones for pinnipeds and RMS threshold for cetaceans would be closer to the Strait of Juan de Fuca. Because these thresholds would still be confined to within the harbor and monitoring would occur, cetaceans would not be exposed to injury, and pinnipeds foraging in the area would likely continue past the hook and avoid the area. The 120-dB RMS behavioral zone during pile driving would not be different from Alternative 2. Although the location of the proposed TPS pier and pile driving activity would be on the eastern end of Ediz Hook, the underwater noise levels would be intersected by land and would be the same area as calculated under Alternative 2 (8.5 square miles [22.2 km^2]).

A Marine Mammal Monitoring and Mitigation Plan would be implemented during pile driving to protect all marine mammals from injury and avoid behavioral disturbance to most species. Proposed measures would be similar to those described for Alternative 1, except that the geographic extent of the behavioral disturbance and shutdown zones would be different for Alternative 3 but at the same distances as under Alternative 2, as presented in Table 3.3-11.

Pinnipeds, particularly harbor seals, would likely be present during pile driving, as they are common within the project area year round. As previously described, airborne behavioral disturbance would occur if a harbor seal or pinniped were hauled out within 49 feet (15 m) or 56 feet (17 m), respectively, of the largest pile (66-inch) being impact driven. Harbor seals are unlikely to haul out near the construction area and are typically observed hauled out farther west on Ediz Hook or on the Port of Port Angeles side of the harbor, and would be outside of the behavioral disturbance zones for airborne noise. Sea lions are not typically observed in the harbor and are unlikely to haul out near construction areas, and would likely avoid the area in general with very little impact on behavior.

With the implementation of avoidance and minimization measures described above, no significant impacts on ESA-listed and MMPA-protected marine mammals would occur under Alternative 3.

Essential Fish Habitat

Under Alternative 3, potential impacts on EFH would generally be similar to those described under Alternative 2, except that the TPS pier would be located at the far east end of Ediz Hook and would require the installation of more piles (to accommodate the wave attenuation screen). Soft-bottom substrates are likely more predominant at the Alternative 3 site, and construction would potentially impact groundfish EFH in the area by adding piles (218 ft^2 [20 m^2]) and causing increases of suspended sediment and turbidity in the water column. Underwater noise, water column turbidity, temporary and permanent shading effects, and physical disruption from pile driving activities, work barges, and spud/anchoring systems during construction would create short-term disturbances in habitats used by coastal pelagic species.

In-water construction impacts would be localized and short term, other than a small reduction in soft-bottom habitats for groundfish. As described above, this reduction would be localized to 218 ft^2 (20 m^2) and would not be a significant reduction to the available soft bottom groundfish EFH available within the project area or within Port Angeles Harbor in general. Pacific Coast salmonid EFH and HAPC within the Alternative 3 site (eelgrass) would predominately be temporarily affected by shade and turbidity. However, approximately 15,233 ft^2 (1,415 m^2) of eelgrass would be permanently shaded by the approach trestle and pier, and a design measure in place would rotate the proposed pontoon in an offshore direction to avoid further shading of eelgrass. Compensatory mitigation to minimize and offset the loss of aquatic resources from the TPS pier and treaty mitigation would be implemented (see Section 2.6).

The Navy concludes that implementation of Alternative 3 may adversely affect Pacific coast groundfish, coastal pelagic, and Pacific Coast salmon EFH. However, implementation of BMPs and project-specific measures would avoid and minimize adverse effects on EFH to the extent practicable. Other than the increase of permanent shading from the proposed pier, proposed compensatory mitigation to minimize and offset the loss of aquatic resources within the proposed trestle footprint, and treaty mitigation, adverse effects would be short term, lasting only during the period of construction.

Conclusion

Increased turbidity during in-water construction would result in temporary and localized impacts on marine fish (including ESA-listed species), benthic invertebrates, and EFH. Impact pile driving would expose adult ESA-listed salmonids and resident (non-migratory) fish to noise levels that exceed behavioral and injurious threshold levels. Underwater noise would also impact PS Chinook ESU and bull trout designated critical habitat. Marine mammals would potentially be exposed to noise levels that could result in behavioral disturbance during pile

driving. However, monitoring would preclude exposure to injurious noise levels for all marine mammals and behavioral disturbance for most whales and porpoises, including ESA-listed SRKW and humpback whales. Resulting overwater coverage and piles would result in the displacement of benthic habitat and a potential loss of approximately 15,233 ft^2 (1,415 m^2) of eelgrass. With the short duration of pile driving, the temporary and localized nature of increased turbidity, implementation of marine mammal monitoring, proposed compensatory mitigation to minimize and offset the loss of aquatic resources, and treaty mitigation (see Section 2.6), no significant impacts would result under Alternative 3.

3.3.3.5 No Action Alternative

Under the No Action Alternative, the Navy would not construct a TPS pier and upland facilities at USCG AIRSTA/SFO Port Angeles. There would be no change to biological resources due to the Proposed Action. Therefore, no impacts on biological resources would occur with the implementation of the No Action Alternative.

3.4 Noise

Noise is addressed in this section in terms of its effect on the human environment. Noise effects on fish and wildlife are described in Section 3.3, *Biological Resources*. For context, the basics of the measurement and analysis of sound are briefly described below.

The A-scale approximates the frequency response of the average young ear when listening to most ordinary everyday sounds and is used for measurements and standards involving the human perception of noise. Noise levels using the A-scale are written as dBA. Table 3.4-1 presents sound levels for typical sounds and the typical human response during exposure.

Table 3.4-1. Typical Noise Levels and Human Responses

Common Noises	Noise Level (dBA)	Effect
Rocket launching pad (no ear protection)	180	Irreversible hearing loss
Carrier deck jet operation Air raid siren	140	Painfully loud
Thunderclap	130	Painfully loud
Jet takeoff (200 feet) Auto horn (3 feet)	120	Requires maximum vocal effort
Pile driver Rock concert	110	Extremely loud
Garbage truck Firecrackers	110	Very loud
Heavy truck (50 feet) City traffic	100	Very annoying Hearing damage (eight hours of exposure)
Alarm clock (2 feet) Hair dryer	80	Annoying
Noisy restaurant Freeway traffic Business office	70	Telephone use is difficult
Air conditioning unit Conversational speech	60	Intrusive
Light auto traffic (100 feet)	50	Quiet
Living room Bedroom Quiet office	40	Quiet
Library/soft whisper (15 feet)	30	Very quiet
Broadcasting studio	20	Very quiet
	10	Just audible
Threshold of hearing	0	Hearing begins

Source: Noise Pollution Clearinghouse 2015.

The intensity of environmental noise fluctuates over time, and several different descriptors of time-averaged noise levels are used. The following are sound level descriptors commonly used in environmental noise analysis:

- **L_{max} (Maximum Noise Level):** The highest A-weighted integrated noise level occurring during a specific period of time.
- **L_{min} (Minimum Noise Level)**: The lowest A-weighted integrated noise level during a specific period of time.
- **Peak:** The highest weighted or unweighted instantaneous peak-to-peak value occurring during a measurement period.

- **L_{eq} (Equivalent Noise Level):** The energy mean (average) noise level. The steady-state sound level that, in a specified period of time, contains the same acoustical energy as a varying sound level over the same time period.
- **Day-night average level (L_{dn})**: The energy average of A-weighted sound levels occurring over a 24-hour period, with a 10-dB penalty applied to A-weighted sound levels occurring during nighttime hours (10 p.m. to 7 a.m.).

Sound generated by a stationary point source typically diminishes (attenuates) at a rate of 6 dBA for each doubling of distance from the source to the receptor over hard (reflective) ground surfaces and at a rate of 7.5 dBA over soft (absorptive) ground surfaces. Stationary equipment and noise from construction sites are examples of point sources. Sound from a line source, such as roadway traffic, attenuates at a rate of 3 dBA per doubling of distance over hard ground surfaces and at a rate of 4.5 dBA over soft ground surfaces. An acoustically "hard" or reflective site does not provide any ground-effect attenuation and is characteristic of asphalt, concrete, very hard packed soils, and water. An acoustically "soft" site or absorptive site is characteristic of normal earth and most ground with vegetation.

3.4.1 Regulatory Setting

3.4.1.1 Federal

Noise Control Act of 1972

Section 4(b) of the Noise Control Act of 1972 (42 U.S.C. 4901 et seq.) directs federal agencies to comply with applicable federal, state, and local noise requirements with respect to the control and abatement of environmental noise. Washington State and City of Port Angeles noise standards and regulations to control and abate environmental noise are presented in Section 3.4.1.2.

Occupational Safety and Health Act (OSHA) of 1970 (29 U.S.C. Section 651 et seq.) and Implementing Regulations under (29 CFR 1910 et seq.)

The Occupational Safety and Health Act of 1970 requires employers to provide a safe and healthful workplace. The Occupational Safety and Health Administration (OSHA) occupational noise exposure standard (29 CFR 1910.95) establishes permissible noise level exposure as a function of the amount of time to which a worker is exposed. OSHA requirements limit worker noise exposure to 90 dBA over an 8-hour work shift. If eight-hour worker noise exposure exceeds 85 dBA, the area must be posted as a noise hazard zone and a hearing conservation program is required. All applicable OSHA requirements to protect workers will be followed during construction and operation of the Proposed Action.

3.4.1.2 State

At the state level, WAC 173-60 (Maximum Environmental Noise Levels) establishes the maximum permissible noise levels for which noise from one property may intrude into another property. Land uses are assigned an environmental designation for noise abatement (EDNA) based on the typical land use, taking into consideration the present, future, and historical usage, and the usage of adjacent and other lands in the vicinity (Table 3.4-2).

Table 3.4-2. Washington State EDNAs

EDNA	Land Use Zone
Class A	Lands where human beings reside and sleep: residential, multi-family living accommodations; recreational and entertainment (e.g., camps, parks, camping facilities, and resorts); and community service (e.g., orphanages, homes for the aged, hospitals, health and correctional facilities).
Class B	Lands involving uses requiring protection against noise interference with speech: commercial living establishments; commercial dining establishments; motor vehicle services; retail services; banks and office buildings; miscellaneous commercial services on property not used for human habitation; recreation and entertainment on property not used for human habitation (e.g., theaters, stadiums, fairgrounds, and amusement parks); community services on property not used for human habitation (e.g., educational, religious, governmental, cultural, and recreational facilities).
Class C	Lands involving economic activities of such a nature that higher noise levels than experienced in other areas are normally anticipated. People working in these areas are normally covered by noise control regulations of the department of labor and industries. Uses typical of Class A EDNA are typically not permitted within such areas. Class C EDNAs include storage, warehouse, and distribution facilities; industrial property used for the production and fabrication or durable and non-durable man-made goods; and agricultural and silviculture property used for the production of crops, wood products, or livestock.

Source: WAC 173-60-030.

This regulation applies to noise generated on USCG AIRSTA/SFO Port Angeles that may propagate to adjacent non-USCG properties. Based on both existing and future land uses, onshore areas at USCG AIRSTA/SFO Port Angeles are considered to be Class B EDNAs, and offshore areas (including the existing T-Pier and the proposed TPS pier) are considered to be Class C EDNAs. Table 3.4-3 summarizes the maximum permissible noise levels for which noise from one property (noise source) may intrude into another (receiving property).

Table 3.4-3. Maximum Permissible Noise Levels at Receiving Property Line

	EDNA of Receiving Property			
	Class A		Class B	Class C
EDNA of Noise Source	Day	Night[1]	All Hours	All Hours
Class A	55	45	57	60
Class B	57	47	60	65
Class C	60	50	65	70

Source: WAC 173-60-040.
[1] Between the hours of 10:00 p.m. and 7:00 a.m., the maximum permissible noise levels are reduced by 10 dBA for receiving properties within Class A EDNAs.

The state noise regulations (WAC 173-60-040) limit noise levels from Class C noise sources, such as the proposed TPS pier at USCGA AIRSTA/SFO Port Angeles, to Class B receiving properties such as the adjacent commercial and recreational areas on Ediz Hook, to 65 dBA. The state noise regulations allow these noise levels to be exceeded by up to 15 dBA for certain brief periods without violating the limits (WAC 173-60-040(2)(c)). Sounds originating from temporary construction activities are exempt from these noise levels between the hours of 7:00 a.m. and 10:00 p.m. at Class A EDNAs (residential land uses) and at all times at Class B EDNAs and Class C EDNAs. Sounds created by warning devices not operating continuously for more than 5 minutes, and sounds created by safety and protective devices where noise suppression would defeat the intent, are exempt from provisions of WAC 173-60-040.

3.4.1.3 Local

Noise in the project area is subject to the City of Port Angeles Municipal Code (PAMC), Chapter 15.16 (Noise Control). The city has adopted WAC 173-60 (Maximum Environmental Noise Levels) for the regulation of environmental noise within its jurisdiction.

3.4.2 Affected Environment

Existing land uses at USCG AIRSTA/SFO Port Angeles include both onshore and offshore (the existing T-Pier) uses. Onshore areas are zoned Public Buildings and Parks, and offshore areas are zoned Heavy Industrial (City of Port Angeles 2007, 2011a). Based on zoning and existing (and future) uses, onshore areas at USCG AIRSTA/SFO Port Angeles are considered Class B EDNAs and offshore areas are Class C EDNAs.

On Ediz Hook, commercial and recreational land uses adjacent to USCG AIRSTA/SFO Port Angeles (including the Puget Sound Pilots Station office building and sleeping facilities, Icicle Seafoods onshore facilities, Ediz Hook Boat Launch, Harborview Park, Sail and Paddle Park, the Waterfront Trail, and other public recreation areas) are considered Class B EDNAs. Offshore land uses associated with the Puget Sound Pilots Station (dock and floats for mooring pilots boats), Icicle Seafoods (dock and floating fish pens), and the Ediz Hook Boat Launch (docks) are zoned Heavy Industrial (City of Port Angeles 2007, 2011a) and are considered Class C EDNAs. Nippon Paper Industries, located at the base of Ediz Hook, is an industrial land use and considered a Class C EDNA. Across Port Angeles Harbor, the Port Angeles waterfront includes industrial (Class C) and commercial (Class B) land uses. Downtown Port Angeles includes commercial (Class B) and residential (Class A) land uses. There are no Class A EDNAs (e.g., lands where human beings reside and sleep) on USCG AIRSTA/SFO Port Angeles or adjacent land uses on Ediz Hook.

The closest Class A EDNAs to USCG AIRSTA/SFO Port Angeles are residential neighborhoods located about 8,000 feet (1.5 miles) across Port Angeles Harbor in the inland downtown areas behind the waterfront (City of Port Angeles 2007, 2011a).

3.4.2.1 Background Sound Levels

The ambient sound level of an area includes sounds from natural sources (wind, waves, birds), excluding anthropogenic sources. The background (or surrounding) sound level of an area includes sounds from both natural (wind, waves, birds) and anthropogenic (vehicles, aircraft, ships, horns) sources, independent of the specific source being measured. Ambient and background sound levels vary based on the setting where they are measured. For example, rural areas commonly have daytime sound levels ranging from 35 to 40 dBA (Leq), suburban or residential areas have daytime sound levels ranging from 45 to 50 dBA, and urban areas have sound levels ranging from 60 to 70 dBA (Caltrans 2009b; Cavanaugh and Tocci 1998; EPA 1978). Sound levels in high-density urban areas, commercial areas with heavy traffic, heavy industrial areas, and urban areas adjacent to freeways or airports sometimes can be substantially higher. Background noise levels can be estimated based on population density. The population density in Port Angeles is 1,888 people per square mile. The estimated daytime background sound level (not including traffic noise) in Port Angeles would be around 50 dBA Leq (Federal Transit Administration 2006; WSDOT 2014). However, daytime sound levels in the industrial/commercial waterfront and along major arterials are likely higher. In this analysis, a conservative estimate of 50 dBA Leq is used as the daytime background sound level in the

residential areas of Port Angeles located across the harbor from USCG AIRSTA/SFO Port Angeles.

The Navy conducted a noise study in 2013 to characterize background sound levels in and adjacent to the project area (Sargeant 2013). Exterior sound levels were measured on the east side of the Puget Sound Pilots Station training and sleeping facility from 10 p.m. on January 24, 2013 to 7 a.m. on January 29, 2013. Interior sound levels were measured inside the facility's sleeping quarters closest to the project site on January 24, 2013.

Average hourly exterior sound levels ranged from 51 to 53 dBA Leq during the daytime, and from 46 to 55 dBA Leq during the nighttime, and are well below the maximum permissible noise levels for a receiving property that is a Class B EDNA (65 dBA). These exterior sound levels are representative of background sound levels at the east end of Ediz Hook in the vicinity of USCG AIRSTA/SFO Port Angeles (i.e., the project area and adjacent areas). The maximum exterior sound levels measured at the Puget Sound Pilots Station exceeded the maximum permissible noise levels from a Class B or Class C EDNA to a Class B EDNA receiving property (Table 3.4-3). However, it is assumed that the higher noise levels were associated with short-term noise from aircraft overflights (Sargeant 2013), and sounds originating from aircraft in-flight are exempt from the maximum permissible noise levels specified in WAC 173-60-040. Interior sound levels were measured at 31 dBA.

3.4.3 Environmental Consequences

The evaluation of noise impacts considers noise generated during construction and noise generated from new facilities and operations. Impacts on the noise environment would be considered significant if the Proposed Action were to result in:

- Exposure of persons to or generation of noise levels in excess of standards established in the City of Port Angeles Noise Ordinance (PAMC 15.16, Noise Control) and Washington State Maximum Environmental Noise Levels (WAC 173-60).

The noise impact analysis in this EA considered the maximum noise level generated at the noise source and then determined how this noise propagates to receiving properties. Standard noise transmission models were used to estimate the dissipation of noise over distance from the noise source. The resulting noise level at receiving properties was compared to the applicable noise thresholds to determine the effects of noise.

3.4.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

For this analysis, construction activities are divided into three categories: pile driving (which would require the use of vibratory and impact pile driving equipment), general construction, and construction traffic. Noise generating construction activities, including pile driving, would be conducted in accordance with state and local noise regulations, as specified in the WAC and PAMC (see Section 3.4.1), and would occur Monday through Friday between the hours of 7:00 a.m. and 10:00 p.m.

Pile Driving Construction Noise

Pile driving would produce the highest noise levels during construction. Under Alternative 1, a total of 224 steel pipe piles (144 permanent piles and 80 temporary piles) and 60 sheet piles would be driven. One to eight piles would be driven per day, with each pile taking 60 to 90

minutes to drive. Pile driving would last a maximum of 4 hours per day for up to 75 days over a period of 18 weeks. Pile driving would be conducted within two in-water work windows (July 16 through February 15) beginning in October 2016 and ending in October 2017.

Pile driving would primarily be accomplished using a vibratory hammer. However, impact pile driving would be used when it is not feasible to drive the piles to the required depth using a vibratory hammer, and where proof testing of piles is required. Airborne noise levels from impact pile driving are estimated at 110 dBA L_{max} at a distance of 50 feet from the pile, while noise levels from vibratory pile driving are estimated at 101 dBA L_{max} at 50 feet from the pile (WSDOT 2014). Pile driving noise behaves as a point source and thus spreads in a spherical manner with a 6 dBA decrease per doubling of distance. Noise generated during pile driving would propagate primarily over water to the east, south, and west in Port Angeles Harbor. This is considered a hard site condition and thus no additional attenuation factors apply. To the north, pile driving noise would propagate over water for a short distance, then over flat terrain on Ediz Hook. Surface conditions on land in the vicinity of the project area include both pavement and grass. Because pavement (roads, parking areas) are the predominant surface condition, this is also considered a hard site condition and no additional attenuation factors apply. Table 3.4-4 presents peak airborne noise levels versus distance for vibratory and impact pile driving. Estimated noise levels are provided for every doubling of distance and at distances to nearby receiving properties.

Noise generated during vibratory pile driving would be relatively continuous, while impact pile driving would be intermittent or periodic. Vibratory pile driving noise could potentially exceed the maximum allowable worker noise exposure limits under OSHA (90 dBA over an 8-hour work shift within approximately 180 feet), and 8-hour worker noise exposure could exceed 85 dBA within approximately 315 feet, and could potentially cause hearing injury to construction personnel working at the site. Personal protective equipment that meets OSHA requirements would be required for construction personnel working in high noise areas, and the construction contractor would be required to establish and post a noise hazard zone and establish a hearing conservation program.

The closest residences (Class A receiving properties) to the project site are located approximately 8,000 feet across the harbor in downtown Port Angeles. These residences could experience exterior noise levels up to 57 dBA during vibratory pile driving and up to 66 dBA during impact pile driving (Table 3.4-4). This is a conservative estimate that assumes flat topography and direct line-of-sight between the noise source and receiving property. It does not take into account shielding by intervening buildings, topography, or vegetation. The Port Angeles waterfront across the harbor south of the project site is backed by forested bluffs, and the Port Angeles downtown is located on a narrow plateau above the bluffs, which quickly transition into low ridges backed by the Olympic Mountains within 2 to 3 miles of the project area. Given the intervening buildings and topography (bluffs and ridges), residences in downtown Port Angeles, especially those greater than 2 to 3 miles from the project area, would likely experience substantially lower noise levels during impact pile driving than estimated in Table 3.4-4, and close to ambient levels. Impacts could include annoyance and disturbance to outdoor speech (EPA 1979) at the closest residences. However, construction noise is exempt from the maximum permissible noise levels specified in WAC 173-60-040, so this would not be considered a significant impact.

Table 3.4-4. Attenuation vs. Distance for Pile Driving Airborne Noise (in dBA)

Distance (feet)	Noise Levels from Impact Pile Driving (L_{max})	Noise Levels from Vibratory Pile Driving (L_{max})
50	110	101
100	104	95
200	98	89
400	92	83
800	86	77
1,600	80	71
2,150 (Puget Sound Pilots Station & Closest Public Access Point)	77	68
3,200	74	65
6,400	68	59
7,000 (Port Angeles Waterfront)	67	58
8,000 (Closest Residences)	66	57
12,800	62	53
25,600	56	47
51,200	50	41

Note: Calculated SPLs at specified distance are rounded to the nearest whole number.

The closest Class B receiving properties to the project site are located on Ediz Hook, and include the Puget Sound Pilots Station and public recreation areas to the west. All Class B receiving properties on Ediz Hook, and humans engaged in water-based activities in Port Angeles Harbor, within approximately 12,800 feet (2.42 miles) would experience temporary and periodic increases in noise levels above ambient noise levels (51 to 53 dBA) during pile driving that could result in annoyance and interference with outdoor speech and communication. Class B receiving properties closest to the Alternative 1 site, including the Puget Sound Pilots Station located 2,150 feet west of the site, would experience temporary noise levels up to 68 dBA during vibratory pile driving and periodic noise levels up to 77 dBA during impact pile driving. Aside from the Puget Sound Pilots, most land- and water-based human use in this area is transitory, and exposure to the increased noise levels would be temporary. While impacts would include annoyance and interference with outdoor speech and communication (EPA 1979), construction noise is exempt from the maximum permissible noise levels from a Class C to Class B EDNAs specified in WAC 173-60-040, so this would not be considered a significant impact.

Standard building construction typically achieves a noise reduction of 25 dBA when windows are closed (EPA 1979). Based on this, interior noise levels at the Puget Sound Pilots Station during vibratory pile driving would be approximately 43 dBA. This is considered quiet and would not be expected to interfere with sleep or communication (EPA 1979). Interior noise levels during impact pile driving would be approximately 52 dBA. This is generally considered to be below intrusive noise levels, but would be noticeable and perceived as about twice as loud as ambient interior noise levels; therefore, it could result in periodic interference with sleep during daylight hours. Pile driving is expected to occur only up to a maximum of 4 hours per day on pile driving days; impact pile driving would occur only a fraction of that time, so interference with sleep during daylight hours would be intermittent and short in duration. Earplugs could be used to reduce noise from impact pile driving. Construction noise is exempt from the maximum permissible noise levels from a Class C to Class B EDNAs specified in WAC 173-60-040, so

this would not be considered a significant impact. Overall, construction of Alternative 1 would not have significant noise impacts during pile driving activities.

Non-Pile Driving Construction Noise

General (non-pile driving) construction activities would include the demolition of existing structures, excavation, placement of riprap and fill, grading, paving, materials handling, building construction, and the installation of utilities, fencing, and other ancillary features. Construction equipment would likely include heavy equipment such as cranes, clam shovels, excavators, backhoes, front loaders, graders, pavers, rollers, and dump trucks; and stationary equipment such as pumps, power generators, and air compressors, in addition to pneumatic and hand tools.

Average maximum noise levels (L_{max}) from heavy construction equipment range from about 73 to 101 dBA for non-impact equipment (FHWA 2006). Average hourly noise levels from stationary equipment, which typically operates at a constant speed and power continuously, range from 68 to 88 dBA (WSDOT 2014). Assuming that multiple pieces of the noisiest construction equipment would operate at the same time (e.g., clam shovel, grader, crane, pneumatic tools), combined average hourly noise levels in the absence of pile driving are estimated to be as high as 89 dBA Leq at 50 feet (FHWA 2006). A worst-case scenario assumes this noise level would be sustained continuously. However, construction activities and resulting noise levels would likely vary throughout the day. Table 3.4-5 presents the estimated average hourly construction noise levels versus distance for general construction in the absence of pile driving. Estimated noise levels are provided for every doubling of distance and at distances to the closest Class A and Class B receiving properties.

Table 3.4-5. Attenuation vs. Distance for General Construction Equipment (dBA) – Alternative 1

Distance (feet)	Average Hourly Noise Level (dBA Leq)
50	89
100	83
200	77
400	71
800	65
1,600	59
2,150 (Puget Sound Pilots Station and Closest Public Access Point)	56
3,200	53
6,400	47
7,000 (Port Angeles Waterfront)	46
8,000 (Closest Residences)	45

Note: Calculated SPLs at specified distance are rounded to the nearest whole number.

In the absence of pile driving, construction noise would attenuate to ambient levels at the closest residences (Class A receiving properties) across the harbor from the Alternative 1 site, and there would be no noise impacts. The Puget Sound Pilots Station and closest public recreation areas (Class B receiving properties) to Alternative 1 would experience noise levels up to approximately 56 dBA. This is a 3 to 5 dBA increase above the ambient levels (51 to 53 dBA Leq). A 3-dBA increase in noise is barely detectable to most people. While a 5-dBA increase is

readily apparent, noise levels of 56 dBA are generally considered to be below intrusive noise levels. Noise impacts would be limited to mild annoyance. Construction noise is exempt from the maximum permissible noise levels specified in WAC 173-60-040, so this would not be considered a significant impact. Construction of Alternative 1 would not have significant noise impacts from non-pile driving construction activities.

Construction Traffic Noise

Construction activities would generate intermittent increases in traffic volumes, including employee passenger vehicles (cars and small trucks) and haul trucks, on the local area road network. Traffic would vary throughout construction of Alternative 1 along any specific route, but all roadway construction traffic would use Marine Drive and Ediz Hook Road to access the project site. Existing traffic volumes on Marine Drive and Ediz Hook Road are low; roadway traffic noise is not a major contributor to the existing noise environmental on Ediz Hook, which is dominated by noise from industrial activities along the Port Angeles Harbor working waterfront, marine traffic, and intermittent noise from aircraft and helicopter operations. Typically, traffic volumes must double to create a perceptible (3-dBA) increase in traffic noise. The project would not generate construction traffic volumes of this level, except for a short surge in traffic volumes on Marine Drive and Ediz Hook Road (along the length of Ediz Hook) at the start and end of each workday. However, overall traffic volumes and traffic noise levels would still be quite low. Construction of Alternative 1 would not have significant noise impacts from construction traffic.

In conclusion, noise impacts during the construction of Alternative 1 could include mild to moderate annoyance and interference with outdoor speech at adjacent properties on Ediz Hook, primarily during pile driving, and intermittent short-term interference with daytime sleep at the Puget Sound Pilots Station during impact pile driving. However, Alternative 1 would have no significant noise impacts during construction activities.

Operation/Long-term Impacts

Ambient exterior noise levels at the Puget Sound Pilots Station and USCG AIRSTA/SFO Port Angeles range between 51 dBA and 53 dBA Leq (Sargeant 2013), well below the maximum noise levels permitted from a Class C to a Class B EDNA (65 dBA) or to a Class C EDNA (70 dBA) (Table 3.4-3). Vessel operations at the proposed TPS pier are expected to generate the highest operational noise levels over the long term. Based on the noise study conducted for the Proposed Action (Sargeant 2013), noise levels generated during TPS vessel operations would be approximately 53 dBA during vessel idling, and approximately 57 dBA during vessel departure. Resulting exterior noise levels at the Puget Sound Pilots Station, located approximately 2,150 feet to the west of Alternative 1, would be within ambient levels. Isolated short-term events, such as chemical alarm testing and whistles, could generate noise levels of 70 to 72 dBA for brief periods (up to 5 minutes) at or near the proposed TPS pier. Short-term noise from chemical alarm testing, chemical alarms, and whistles would attenuate to ambient noise levels at the Puget Sound Pilots Station. Furthermore, these are considered to be sounds created by warning devices not operating continuously for more than 5 minutes, and safety and protective devices where noise suppression would defeat the intent, and would therefore be exempt from provisions of WAC 173-60-040.

In conclusion, Alternative 1 would not have significant noise impacts at the Puget Sound Pilots Station or other receiving properties on Ediz Hook or in downtown Port Angeles during vessel operations at the proposed TPS pier.

3.4.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Pile Driving Construction Noise

In general, construction activities and resulting noise levels would be similar to those under Alternative 1. However, under Alternative 2, 47 steel pipe would be driven (17 permanent and 30 temporary piles), and an additional 162 sheet steel piles would be installed along the jetty. Overall, the number of pile driving days would be 15 days over a period of 5 weeks.

Noise impacts at residences (Class A receiving properties) in downtown Port Angeles would be the same as Alternative 1. The closest residences could experience exterior noise levels up to 57 dBA during vibratory pile driving and up to 66 dBA during impact pile driving (Table 3.4-4), 4 dBA to 13 dBA above estimated ambient noise levels. However, intervening topography and buildings along the waterfront would likely provide some shielding and reduce noise levels in the residential areas behind the waterfront. Noise increases from vibratory pile driving would be just perceptible. Noise impacts from impact pile driving could include annoyance and disturbance to outdoor speech (EPA 1979). Construction noise is exempt from the maximum permissible noise levels specified in WAC 173-60-040, so this would not be considered a significant impact.

Similar to Alternative 1, all Class B receiving properties on Ediz Hook, and humans engaged in water-based activities in Port Angeles Harbor, within approximately 12,800 feet (2.42 miles) would experience temporary and periodic increases in noise levels above ambient noise levels (51 to 53 dBA) during pile driving that could result in annoyance and interference with outdoor speech and communication. The Puget Sound Pilots Station, located 350 feet to the west, would experience temporary noise levels up to 84 dBA during vibratory pile driving, and periodic noise levels up to 93 dBA during impact pile driving, in outdoor areas, 31 dBA to 40 dBA above ambient levels, respectively. Interior noise levels at the Puget Sound Pilots Station would be approximately 59 dBA during vibratory pile driving and 63 dBA during impact pile driving, and could result in intermittent short-term interference with sleep during daylight hours and indoor speech and communication. Pile driving is expected to occur only up to a maximum of 4 hours per day on pile driving days, and impact pile driving would occur only a fraction of that time, so interference with sleep during daylight hours would be intermittent and short in duration. Earplugs could be used to reduce noise during pile driving. Construction noise is exempt from the maximum permissible noise levels from a Class C to Class B EDNAs specified in WAC 173-60-040, so this would not be considered a significant impact. Overall, construction of Alternative 2 would not have significant noise impacts during pile driving activities.

Non-Pile Driving Construction Noise and Construction Traffic Noise

General construction noise and construction traffic noise levels would be similar to those under Alternative 1. Noise impacts at the closest residences (Class A receiving properties) across the harbor from the Alternative 2 site would be essentially the same; however, noise impacts would be shifted west compared to Alternative 1. The center of general construction activities would be closer to the Puget Sound Pilots Station and the nearest public recreation areas (Class B receiving properties) to the west of the USCG AIRSTA/SFO Port Angeles entrance gate than Alternative 1, so resulting noise levels at those locations during construction would be higher.

In the absence of pile driving, the Puget Sound Pilots Station and the nearest public recreation areas, located 350 feet west of Alternative 2, would experience exterior noise levels during

construction up to approximately 72 dBA (Table 3.4-6). This would be a 21-dBA increase above ambient noise levels (51 to 53 dBA Leq).

Table 3.4-6. Attenuation vs. Distance for General Construction Equipment (dBA) – Alternative 2

Distance (feet)	Average Hourly Noise Level (dBA Leq)
50	89
100	83
200	77
350 (Puget Sound Pilots Station & Closest Public Access Point)	72
400	71
800	65
1,600	59
3,200	53
6,400	47
7,000 (Port Angeles Waterfront)	46
8,000 (Closest Residences)	45

Note: Calculated SPLs at specified distance are rounded to the nearest whole number.

A 10-dBA increase in noise is typically perceived as twice as loud by most people, and a 20-dBA increase is perceived as four times as loud. Exterior noise levels of 70 dBA are typically perceived as intrusive and can interfere with outdoor speech and communication. Interior noise levels at the Puget Sound Pilots Station would be approximately 47 dBA. While this is above ambient interior noise levels measured at the Pilots Station of 31 dBA (Sargeant 2013), a noise level of 47 dBA is considered to be quiet. Interior noise impacts at the Puget Sound Pilots Station could include slight interference with sleep during daytime hours, although impacts would be lower than during pile driving. Construction noise is exempt from the maximum permissible noise levels specified in WAC 173-60-040, so this would not be considered a significant impact. Construction of Alternative 2 would not have significant noise impacts from non-pile driving construction activities.

Operation/Long-term Impacts

Ambient exterior noise levels at the Puget Sound Pilots Station and USCG AIRSTA/SFO Port Angeles range between 51 dBA and 53 dBA Leq (Sargeant 2013), well below the maximum noise levels permitted from Class C to Class B EDNAs (65 dBA) or Class C EDNAs (70 dBA) (Table 3.4-3). Vessel operations at the proposed TPS pier are expected to generate the highest operational noise levels over the long term. Based on the noise study conducted for the project (Sargeant 2013), noise levels at the Puget Sound Pilots Station would be about 53 dBA during vessel idling (the same as existing noise levels) and about 57 dBA during vessel departure, an increase of about 4 dBA over ambient levels. A 4-dBA increase in noise levels would be noticeable but would not exceed the maximum permissible noise levels from Class C to Class B EDNAs. Interior noise levels would be close to ambient interior noise levels and would have no impact. Isolated short-term events, such as chemical alarm testing, chemical alarms, and whistle use, could result in noise levels of 70 to 72 dBA for brief periods. However, sounds created by warning devices not operating continuously for more than 5 minutes, and sounds created by safety and protective devices where noise suppression would defeat the intent are exempt from provisions of WAC 173-60-040.

In conclusion, Alternative 2 would not have significant noise impacts at the Puget Sound Pilots Station or other receiving properties on Ediz Hook or in downtown Port Angeles during vessel operations at the proposed TPS pier.

3.4.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Pile Driving Construction Noise

Under Alternative 3, 87 piles steel pipe and H-piles would be driven (57 permanent and 30 temporary piles), for 25 days over a period of eight weeks.

Alternative 3 would have the same impacts on residences (Class A receiving properties) in downtown Port Angeles as Alternative 1. The closest residences could experience exterior noise levels up to 57 dBA during vibratory pile driving and up to 66 dBA during impact pile driving (Table 3.4-4); however, intervening buildings and topography would reduce noise closer to ambient levels. Impacts could include annoyance and disturbance to outdoor speech (EPA 1979) at the closest residences. However, construction noise is exempt from the maximum permissible noise levels specified in WAC 173-60-040, so this would not be considered a significant impact.

Similar to Alternative 1, All Class B receiving properties on Ediz Hook, and humans engaged in water-based activities in Port Angeles Harbor, within approximately 12,800 feet (2.42 miles) would experience temporary and periodic increases in noise levels above ambient noise levels (51 to 53 dBA) during pile driving. The Class B receiving properties closest to the Alternative 3 site, including the Puget Sound Pilots Station located approximately 5,200 feet to the west, would experience temporary noise levels up to 61 dBA during vibratory pile driving and periodic noise levels up to 70 dBA during impact pile driving, 11 dBA to 19 dBA above ambient levels (51 to 53 dBA). A 10-dBA increase in noise is typically perceived as twice as loud by most people, and a 20 dBA increase is perceived as 4 times as loud. Exterior noise levels above 60 dBA are typically perceived as intrusive and can interfere with outdoor speech and communication. Interior noise levels at the Puget Sound Pilots Station would be 36 dBA during vibratory pile driving and 45 dBA during impact pile driving. These noise levels are considered to be quiet and would not be expected to interfere with sleep or indoor speech and communication. Overall, exterior noise levels during pile driving could result in intermittent short-term annoyance and interference with outdoor speech and communication at adjacent receiving properties. However, construction noise is exempt from the maximum permissible noise levels from a Class C to Class B EDNAs specified in WAC 173-60-040, so this would not be considered a significant impact. Overall, construction of Alternative 3 would not have significant noise impacts during pile driving activities.

Non-Pile Driving Construction Noise and Construction Traffic Noise

General construction noise and construction traffic noise levels would be similar to Alternative 1. The center of general construction activities would be farther from the Puget Sound Pilots Station and other Class B receiving properties to the west of the USCG AIRSTA/SFO Port Angeles entrance gate than Alternative 1, so temporary increases above ambient noise levels at those locations during construction would be lower. Temporary increases above ambient noise levels at Class A and Class B receiving properties across the harbor from the Alternative 3 site would be essentially the same; however, noise impacts would be shifted east compared to Alternative 1. In the absence of pile driving, the Puget Sound Pilots Station and closest public

access points, located 5,200 feet west of the Alternative 3 site, would not experience an increase in noise above ambient noise levels. Alternative 3 would not have a significant noise impact from non-pile driving construction activities.

Operation/Long-term Impacts

Operations and resulting noise levels would be similar to Alternative 1. However, vessel operations would occur more than 5,200 feet from the Puget Sound Pilots Station and other Class B receiving properties to the west of the USCG AIRSTA/SFO Port Angeles entrance gate. Noise generated during idling and departure operations at the proposed TPS pier, and noise from fuel loading and whistles, would attenuate over distance to well below ambient levels (51 to 53 dBA), and would not exceed maximum permissible noise levels from Class C to Class B EDNAs (65 dBA). Isolated short-term events, such as fuel loading and whistles, could result in noise levels of 70 to 72 dBA for brief periods. Short-term noise from chemical alarm testing, chemical alarms, and whistles would attenuate to ambient noise levels at the Puget Sound Pilots Station. Furthermore, these are considered to be sounds created by warning devices not operating continuously for more than 5 minutes, and safety and protective devices where noise suppression would defeat the intent, and would therefore be exempt from provisions of WAC 173-60-040.

In conclusion, Alternative 3 would not have significant noise impacts at the Puget Sound Pilots Station or other receiving properties on Ediz Hook or in downtown Port Angeles during vessel operations at the proposed TPS pier.

3.4.3.4 No Action Alternative

Under the No Action Alternative, the proposed TPS pier and support facilities would not be constructed, and there would be no change to baseline noise levels due to the Proposed Action. Therefore, no significant impacts due to noise would occur with the implementation of the No Action Alternative.

3.5 Cultural Resources

Cultural resources can be defined as the physical evidence or place of past human activity. They can consist of prehistoric and historic districts, sites, buildings, landscapes features, structures, artifacts, or places considered important to a culture or community for scientific, traditional, religious, or other reasons.

Cultural resources can be divided into three major categories: archaeological resources, architectural resources, and traditional cultural properties (TCPs). Archaeological resources (prehistoric and historic) are locations where human activity altered the earth or left deposits of physical remains (e.g., stone flakes, arrowheads, or bottles). Archaeological resources can include campsites, middens, lithic scatters, logging camps, historic dumps, roads or trails, and a variety of other features. Architectural resources include buildings, dams, canals, bridges, cemeteries, landscape features, and other built-environment resources of historic or aesthetic significance. In accordance with the *Guidelines for Evaluating and Documenting Traditional Cultural Properties*, National Register Bulletin 38 (Parker and King 1998), a TCP is defined as a property or place eligible for inclusion on the National Register of Historic Places (NRHP) because of its association with cultural practices and beliefs that are: (1) rooted in the history of a community, and (2) are important to maintaining the continuity of that community's traditional beliefs and practices (Parker and King 1998).

3.5.1 Regulatory Setting

A number of federal laws, regulations, and other guidance protect cultural resources. The primary regulatory authority for historic preservation is the National Historic Preservation Act (NHPA) of 1966 (54 U.S.C. 306108) and its amendments. Section 106 of this law requires that federal agencies identify and assess the effects of federal undertakings on historic properties. An undertaking is a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency; those carried out with federal financial assistance; and those requiring a federal permit, license, or approval (36 CFR 800.16(y)). A historic property is any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. The term also includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization that meet the National Register criteria (36 CFR 800.16(l)(1)) for inclusion in the NRHP. In assessing effects, the agency must also ensure that both surface and subsurface impacts are considered. Eligible properties generally must be at least 50 years old and meet at least one of four criteria of significance, as well as possess appropriate integrity. More recent structures, such as Cold War-era buildings, may warrant protection if they are "exceptionally important." The four criteria of significance are: (A) association with events important to the broad patterns of history; (B) association with famous persons; (C) embody the distinctive characteristics of a type, period, or method of construction, or possess high artistic values; and (D) have yielded or are likely to yield information important in prehistory or history (36 CFR 60.4).

Archaeological resources on federal lands also receive federal protection under the Archaeological Resources Protection Act of 1979, the NAGPRA of 1990, the American Indian Religious Freedom Act of 1978, and EO No. 13007. Supporting guidance is provided by DoD and Navy instructions: DoD Instruction 4715.16, Cultural Resource Management (DoD 2008); OPNAVINST 5090.1D, Environmental Readiness Program (Navy 2014a); and NAVFACINST 11010.45, Regional Planning Instruction Cultural Resources (Navy 2001).

The Navy has consulted with the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe and with the State Historic Preservation Officer (SHPO),

Washington Department of Archaeology and Historic Preservation (DAHP) on the Proposed Action and potential impacts on cultural resources under Section 106 of the NHPA. On April 25, 2016, DAHP concurred with the Navy's determination of No Adverse Effect on cultural resources (Appendix C).

3.5.2 Affected Environment

For cultural resources, the affected environment is defined as the Area of Potential Effects (APE) determined in compliance with NHPA. As defined in 36 CFR 800.16(d), the APE is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties if present, and is influenced by the scale and nature of the undertaking. The APE includes the TPS pier, ancillary facilities, and compensatory and treaty mitigation sites proposed under Alternative 1 – Midwestern Site (Preferred Alternative), and includes all work and laydown areas within the APE. The APE for Alternative 1, used for Section 106 consultation, is shown in Figure 3.5-1. It received SHPO concurrent on February 8, 2016 (Appendix C).

3.5.2.1 Historical Context

The southern shore of the Strait of Juan de Fuca was once home to a dozen winter villages of the Salish-speaking Klallam Indians. Nearly all of these villages, located between the Hoko River near Clallam Bay and Discovery Bay, were sited in sheltered coves protected from the sea by a sand spit. A row of wood houses fronted a broad beach where outdoor activities were conducted (Gunther 1927). Every village had a cemetery, preferably out on the sandspit, but also in the woods (Gunther 1927). Subsistence activities were dominated by salmon and other types of ocean fishing, supplemented by shellfish collecting, mammal and bird hunting, and gathering of plant foods (Suttles 1990). Winter villages were always situated near good fishing locations; however, during warmer seasons of the year, tribal members travelled by canoe to family-controlled fishing stations, hunting grounds, and berrying places to collect and process food resources (Gunther 1927).

Two historic Klallam villages were located in Port Angeles Harbor, *ʔiʔínəs* (Ennis), at the mouth of Ennis Creek, and *ĉixw ícən* (Tse-whitzen), at the base of Ediz Hook. The word "Ediz" is an anglicized version of *ʔiʔínəs* (Ennis), meaning "good beach," which describes the Port Angeles Harbor beach front. Ediz Hook was known as *tsiqw əẏ*, meaning "sand spit" (Waterman 1922).

According to Waterman (1922), the village of *ĉixw ícən* was a place of considerable importance to the Klallam. Archaeological excavations at *ĉixw ícən* demonstrate that the Klallam have occupied this shoreline for at least 2,700 years (Lewarch et al. 2006). Ediz Hook was part of the larger village catchment area where a variety of cultural activities took place. Oral histories from Klallam tribal elders describe significant events experienced by the Klallam at Ediz Hook including religious activities (Charles 2007). The Klallam people frequently fished for salmon, lingcod, and squid from Ediz Hook, and it was regularly used as a fishing station prior to white settlement (USCG 2008).

A Spanish expedition headed by Francisco de Eliza was the first to sail into Port Angeles Harbor in 1791. De Eliza named the harbor Puerto de Nuestra de Senora de los Angeles. A year later, another Spanish explorer, Alcala-Galiano, shortened the name to Port Angeles. The Spanish gave up their claims to the area shortly thereafter. Captain Henry Kellet of the British Royal Navy visited the area in 1847 and named the sandspit Ediz Hook (Martin 1983). The first white settlers arrived in Port Angeles Harbor in 1856 (Ayres 1953). In 1862, President Lincoln signed an executive order setting aside 3,520 acres on Port Angeles Harbor as a federal reserve for

Figure 3.5-1. Area of Potential Effects (APE) for Alternative 1 – Midwestern Site (Preferred Alternative)

lighthouse, military, and naval purposes. Ten acres on Ediz Hook were for the planned lighthouse, while the remaining "military" reserve was to be a federal townsite. The intent behind establishing the federal townsite was to sell federal land to raise money to help pay the military costs of the Civil War then in progress. Prior to the 1860s, the local citizens maintained a fire beacon on the spit for the benefit of mariners (Oldham 2007).

In 1855 the Territorial Governor and the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe (and other tribes) signed the Treaty of Point No Point. The Klallam/S'Klallam Tribes were assigned to the Skokomish reservation at the mouth of the Skokomish River, but chose not to settle there. Most continued to occupy their traditional lands, including the Port Angeles Harbor, with two groups eventually buying up land in Port Gamble and Jamestown. As a result of the 1934 Indian Reorganization Act, those Klallam living in the Port Angeles area were given a 353-acre land settlement at the mouth of the Elwha River. In 1968, tribal members incorporated and established a reservation on this land (Ruby et al. 2010; Valadez 2001).

In 1908, the east end of Ediz Hook was established as a Federal Lighthouse Reservation by Presidential Order. The rest of the military reservation was leased to the City of Port Angeles in 1914 for development. Hydropower from the recently built Lower Elwha River dam fueled construction of a number of timber mills and related industries along the Port Angeles waterfront and at the base of Ediz Hook (Fish 1976). As the Port Angeles shoreline developed, Klallam families living on the Port Angeles shoreline moved to their fishing stations on Ediz Hook. This "squatter" village, as it was called by whites, was established as early as 1860 with inhabitants from *ĉixw ícən* and *ʔiʔínəs*. The Lower Elwha Klallam recall that they were pushed out of their homes to the only land available (Kaehler et al. 2003). For subsistence, men fished for halibut, lingcod, and devil fish (octopus) and worked for wages in mills or logging camps (Kaehler et al. 2003).

The Ediz Hook village expanded as more displaced Klallam moved to the spit. In his report on Ediz Hook in 1915, Cantwell wrote that Port Angeles Bay was occupied "by a settlement of fishing shacks and small docks along the entire spit, that extend almost the entire distance to the lighthouse" (Lewarch et al. 2006). From the late 1920s through the 1930s, efforts were made by the City of Port Angeles and other entities to remove the squatters (Lewarch et al. 2006). Available land was further reduced in 1935 when the first USCG Air Station on the Pacific coast was established on 175 acres at the east end of Ediz Hook (USCG 2008). The squatter village was finally abandoned in 1939 when the four remaining Ediz Hook families were provided housing on the Klallam land settlement in the Lower Elwha valley with funds authorized by the Indian Reorganization Act (Morrison 1939; Valadez 2001).

The Lower Elwha Klallam Tribe continue to use Ediz Hook for tribal fishing and other purposes, and own several parcels including Harborview Park.

3.5.2.2 Archaeological Resources

There have been a number of archaeological investigations of USCG AIRSTA/SFO Port Angeles and Ediz Hook. Most relevant is a cultural resources protection and management plan developed for the entire USCG property (LAAS 2006). This report identifies areas of low, moderate, and high probability for the presence of intact archaeological resources, with archaeological monitoring recommended for excavations in moderate to high probability areas. The APE of the Proposed Action is located in areas of moderate to high probability. The authors developed a resource procurement model, called "tethered collecting," for the Port Angeles Harbor, which involved short to long trips to exploit different resources from a single base camp. Within this model, Ediz Hook would be considered a short-term fishing and sea mammal hunting

station, with additional uses as a place to launch or land canoes, a lookout for whales, and shellfish collecting. With the exception of the squatter community, archaeological resources present on Ediz Hook likely reflect short-term procurement activities (LAAS 2006).

None of the archaeological investigations conducted within the APE have identified historic properties; however, bone and historic artifacts have been observed in archaeological monitoring (Madson and Larson 1998; Kuhn and Schalk 1997). These materials were found in natural deposits underlying 12 inches of fill beneath the USCG runway (Kuhn and Schalk 1997) and underneath 30 inches of fill along the north edge of the Ediz Hook Road (Madson and Larson 1998). The existence of a fill cap over the natural ground surface was confirmed by Navy archaeologists who monitored geotechnical boring for the Proposed Action in 2014. Approximately 5 feet of fill was found overlying the natural ground surface next to the Port Angeles Harbor shoreline (Hughes 2014). The monitoring results suggest that the fill thins from 5 feet along the shoreline to 1 foot underneath the runway. Because most excavations would not exceed 4.5 feet in depth, the potential for finding historic properties underneath the fill, if present, is extremely low.

3.5.2.3 Architectural Resources

An initial review of USCG architecture found that the Administration Building was the only structure eligible for listing on the NRHP (Grulich Architecture and Planning 1994). In 1996, the USCG contracted the Architectural Resources Group to revise the Grulich study and evaluate the NRHP eligibility of the architectural resources at USCG AIRSTA/SFO Port Angeles as individual resources and as contributing elements to a potential NRHP historic district. The study found that USCG AIRSTA/SFO Port Angeles is historically significant at the national level under National Register Criteria A and C; significance attained from its role in the defense of the northwest coast during World War II. It is also significant at the state level as an important contributor to the economic and maritime development of the Northern Olympic Peninsula region of Washington. The site, however, has undergone too many changes, and too few of the primary structures remain to form a coherent historic district (Architectural Resources Group 1996). The study found that two structures are individually eligible for the NRHP: the Administration Building and the Aircraft Hangar. The period of significance is from 1935 to 1948.

The first lighthouse on Ediz Hook was built in 1863 and then replaced in 1908. The building remained in service until 1945 when the beacon was placed on top of the control tower of the adjoining USCG AIRSTA/SFO Port Angeles. In 1885, a pyramidal frame bell house was constructed near the lighthouse to mount the largest fog bell in the area. The original lighthouse was demolished in 1939, and in 1946, the 1908 lighthouse tower was barged to Port Angeles for use as a private residence. The site was nominated for listing on the NRHP in 1977, but the nomination was rejected because the site lacked integrity. All that currently remains are foundations, cisterns, and a small oil storage shed (Williamson 1977). Although the lighthouse is gone, the site is listed as a significant property on the Washington State Register of Historic Places.

3.5.2.4 Traditional Cultural Properties

Cultural resources may also include TCPs. While not formally recorded as a TCP, the Lower Elwha Klallam Tribe have stated that they consider Ediz Hook to be a TCP (Charles 2007) because “culturally and historically the geographic feature … has been utilized and occupied by the Lower Elwha Klallam Tribe from its earliest origins” (Charles 2007; USCG 2008). Discussions with tribal representatives regarding the Proposed Action have affirmed their belief that Ediz Hook is part of a larger TCP that includes the Port Angeles Harbor referred to as *ĉixw íc̓ən.*

3.5.3 Environmental Consequences

In accordance with 36 CFR 800.5, an action results in an adverse effect on an NRHP-eligible resource when it alters the resource characteristics that qualify it for inclusion in the NRHP. An adverse effect occurs when the undertaking directly or indirectly alters any of these characteristics in a manner that would diminish the property's integrity. Examples of direct impacts include physical destruction, damage, or alteration of a resource; alteration of the character of the surrounding environment that contributes to the resource's eligibility; introduction of visual, audible, or atmospheric intrusions out of character with the resource or its setting; and neglect of the resource, resulting in its deterioration or destruction; or sale of the property.

Impacts on cultural resources would be considered significant if the Proposed Action were to result in adverse effects on NRHP-eligible resources that could not be addressed through stipulations contained in a memorandum of agreement with the SHPO. Potential impacts on cultural resources as a result of the Proposed Action or alternatives are described below.

3.5.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

The potential for finding archaeological resources within the APE is extremely low because most excavations under Alternative 1 would not exceed 4.5 feet in depth, and 5 feet of fill exists within the project area. For any excavations exceeding 4.5 feet in depth, an archaeological monitor who meets the Secretary of the Interior's Standards would be present to ensure that cultural resources are not affected. Alternative 1 would have no effect on historic architectural properties because none are located within the APE. In consultation with the Lower Elwha Klallam Tribe, the Navy has determined that implementation of Alternative 1 would have no adverse effect on the TCP. Because there would be no adverse effects on archaeological or architectural resources or TCPs, implementation of Alternative 1 would not result in significant impacts on cultural resources.

Operation/Long-term Impacts

There would be no operational impacts on cultural resources with the implementation of Alternative 1.

3.5.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Construction impacts would be similar to those under Alternative 1. However, the Alternative 2 design utilizes the proposed compensatory mitigation site. If this alternative is selected, other compensatory mitigation would need to be developed in consultation with the USACE to compensate for impacts on aquatic resources.

Operation/Long-term Impacts

Operation impacts would be similar to those under Alternative 1.

3.5.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Construction impacts would be similar to those under Alternative 1.

Operation/Long-term Impacts

Operation impacts would be similar to those under Alternative 1.

3.5.3.4 No Action Alternative

Under the No Action Alternative, the Navy would not construct a TPS pier and upland facilities. There would be no undertaking and no impacts on cultural resources.

3.6 American Indian Traditional Resources

The Navy consults with federally recognized American Indian tribes on actions with the potential to significantly affect protected tribal resources, tribal rights, or Indian lands. Protected tribal resources are natural resources and properties of traditional or customary religious or cultural importance retained by or reserved by or for Indian tribes through treaties, statutes, judicial decisions, or executive orders. Tribal rights are those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, un-extinguished aboriginal title, treaty, statute, judicial decision, executive order, or agreement, and that give rise to legally enforceable remedies (DoD 2006). The project area is within the usual and accustomed fishing grounds and stations (U&A areas) of the Lower Elwha Klallam Tribe, Port Gamble S'Klallam Tribe, and Jamestown S'Klallam Tribe.

3.6.1 Regulatory Setting

The S'Klallam Tribes were signatories to the 1855 Treaty of Point No Point with the United States. Article 4 of the treaty states that: "the right of taking fish at usual and accustomed grounds and stations is further secured to said Indians, in common with all citizens of the United States; and of erecting temporary houses for the purpose of curing; together with the privilege of hunting and gathering roots and berries on open and unclaimed lands. Provided, however, that they shall not take shellfish from any beds staked or cultivated by citizens" (Treaty of Point No Point, Jan. 26, 1855, 12 Stat. 933).

In 1974, the federal court decision in United States v. Washington—known as the Boldt decision—established that Western Washington tribes who were parties to treaties with the United States have a right of access to their "usual and accustomed fishing grounds and stations" and up to 50 percent of harvestable fish in their U&A areas. The decision also established that the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe have U&A fishing grounds and stations that include the project area.

3.6.1.1 Government-to-Government Consultation

Consistent with EO 13175, Consultation and Coordination with Indian Tribal Governments, the Secretary of the Navy Instruction 11010.14A (Navy 2005) and Commander Navy Region Northwest Instruction 11010.14 (Navy 2009) outline policy, procedures, and responsibilities when consulting with representatives of federally recognized Indian tribes on issues with the potential to impact protected tribal resources, tribal rights, or Indian lands. The Commanding Officer of NAVBASE Kitsap invited the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe to initiate government-to-government consultation in October 2013 and February 2014 regarding the Proposed Action and potential impacts on tribal treaty rights. Government-to-government consultation meetings occurred in 2014 and 2015. As a result of government-to-government consultations, the Navy and the S'Klallam tribes entered into a Memorandum of Agreement that provided mitigation for the impacts of the Proposed Action on tribal treaty rights and resources.

3.6.2 Affected Environment

3.6.2.1 Usual and Accustomed Fishing Grounds and Stations

The U&A area of the Lower Elwha Klallam Tribe, Port Gamble S'Klallam Tribe, and Jamestown S'Klallam Tribe include the waters of the Strait of Juan de Fuca, and all the streams draining into the Strait of Juan de Fuca from the Hoko River east to the mouth of Hood Canal. Traditional fishing areas are found in the waters off of the USCG AIRSTA/SFO Port Angeles property, in the Strait of Juan de Fuca, and Port Angeles Harbor (Lewarch et al. 1992). Tribal members from

the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe engage in subsistence fishing for finfish and shellfish.

3.6.2.2 American Indian Use of Port Angeles Harbor and Ediz Hook

The Lower Elwha Klallam Tribe owns Harborview Park and an adjacent parcel (comprising approximately 4.75 acres) located about 600 feet west of the entrance to USCG AIRSTA/SFO Port Angeles (Figure 3.1-1, *Land Uses in the Project Area*). Existing access areas for tribal fishing near the project area include the Ediz Hook Boat Launch located about 180 feet west of the entrance to USCG AIRSTA/SFO Port Angeles (Figure 3.1-1, *Land Uses in the Project Area*), and fishing occurs along the publicly accessible shoreline of Ediz Hook. Access is not permitted at USCG AIRSTA/SFO Port Angeles.

Harvestable marine resources used by the Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe along Ediz Hook include a variety of marine fish, notably salmon (fishing generally open from July to November), lingcod (May to June), and squid (May to February), which are fished seasonally, but other fish may be fished year round including smelt (USCG 2008). Although shellfish species have historically been abundant along the Strait of Juan de Fuca and on the inner coastline of Port Angeles Harbor, including Ediz Hook (Nyblade 1979), the shellfish harvest area is currently closed due to pollution and is specifically closed for harvest of clams, geoduck, scallops, mussels, oysters, snails, and other invertebrates (Washington State Department of Health 2015). The closure does not apply to crab fishing, which is generally open from July to September.

The Lower Elwha Klallam Tribe, Jamestown S'Klallam Tribe, and Port Gamble S'Klallam Tribe have historically harvested fish and shellfish in the harbor for both commercial and personal use. However, the tribes have closed commercial harvest of crab in Port Angeles Harbor due to the possible contaminated sediments within the harbor. This closure has been in effect for approximately 10 years. The tribes do not specifically prohibit subsistence fishing in the harbor, but urge members not to harvest any fisheries resources in the harbor due to possible contamination (Morrill 2015).

Commercial crab fishing does occur immediately outside the harbor, as defined by the end of Ediz Hook and the old Rayonier pier/dock structure. Commercial crabbing and shrimping occur to the west of Ediz Hook as well. Crab season begins in late June and can extend through the winter until the end of March, depending on markets and remaining quotas. Shrimping season is typically open for short periods of time and is scheduled from May through September. Dive fisheries, such as geoduck clam harvest, sea cucumber harvest, and limited red urchin harvest, occur to the east in the vicinity of Siebert Creek (Green Point). Sea cucumber and red urchin harvest occurs more often to the west in the area from Freshwater Bay to Pillar Point near Clallam Bay. Squid has been harvested both inside and outside Port Angeles Harbor to a limited degree historically, but not in the past 10 years.

Salmon net fisheries occur primarily west of Port Angeles; fishing for sockeye, pink salmon, and chum salmon also occurs to the north and east. Halibut (for commercial, subsistence, and recreational uses) are taken by hook and line and longline north of Green Point, immediately outside of Ediz Hook, and areas to the west. Subsistence herring fisheries occur in Freshwater Bay, Crescent Bay, and other beaches to the west. Morse Creek used to be a popular steelhead fishery, but since there is no longer any outplanting of fish in this creek, there has not been much interest (Morrill 2015).

3.6.3 Environmental Consequences

Impacts on American Indian traditional resources would be considered significant if there were a long-term loss of access to exercise tribal treaty rights secured under the treaty, or a substantial reduction or degradation of harvestable marine resources. All three action alternative sites are located within the U&A area of the tribes. Impacts may be clearly identified, as when a known traditional resource is affected or changed. Consultation with affected American Indian tribal government is necessary to identify and evaluate the extent of any adverse effects and to develop appropriate mitigations. The Navy has an active consultation process in place, and will continue to consult on a government-to-government basis with potentially affected tribes regarding Navy activities that may have the potential to adversely affect protected tribal treaty rights and resources.

3.6.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Under Alternative 1, construction would occur at USCG AIRSTA/SFO Port Angeles for up to 18 months, but would not alter the configuration of the Ediz Hook Boat Launch access to Port Angeles Harbor or public access on the shoreline of Ediz Hook. Construction traffic could create minor delays at the entrance gate long enough to cause backups on Ediz Hook Road in the vicinity of the Ediz Hook Boat Launch. To avoid congestion at the boat launch, construction vehicles would not stop within a 100-yard zone on the west side of the boat launch as they wait to clear the entrance gate. Construction vehicles awaiting entrance to USCG AIRSTA/SFO Port Angeles would wait on the shoulder of the road to allow users unrestricted access to the boat launch. The construction contractor would coordinate with the City of Port Angeles to prepare a traffic control plan to minimize delays of traffic traveling to or accessing the boat launch. (see Section 3.9, *Shore Traffic and Circulation*). In-water construction would include the use of construction barges and other equipment for in-water work. However, construction vessels would be in waters not typically used for tribal fishing and would not substantially alter navigation to fishing areas in Port Angeles Harbor or restrict access to fishing in the Strait of Juan de Fuca (see Section 2.7).

Impacts on harvestable marine resources are expected to be temporary and include increased underwater noise, impacts on water quality, and changes in prey availability near the project area. The greatest impact on marine fish during construction would occur during impact pile driving because pile driving would exceed the established underwater noise behavior guidance and injury thresholds for fish. However, most piles would be installed with vibratory drivers, which have lower amplitude sound levels and have not been associated with fish kills (see Section 3.3, *Biological Resources*). Permanent impacts from overwater coverage (25,465 ft^2) and permanent seafloor disturbance (745 ft^2) would not occur in fishing areas typically used by the tribes and would not substantially reduce the size of known harvest areas (see Section 3.7, *Socioeconomics*).

Construction of the pier would have long-term impacts on habitat important to the tribes; however, the proposed compensatory mitigation and treaty mitigation would have long-term positive impacts on Port Angeles Harbor that would offset and restore the shoreline.

Conclusion

The construction of Alternative 1 could have minor temporary impacts on access to the Ediz Hook Boat Launch and could result in a reduction and degradation of marine habitat that would have a minimal effect on harvestable marine resources, as described above. Impacts on American Indian traditional resources and tribal treaty rights would not be significant under Alternative 1.

3.6.3.2 Alternative 2: Western Site

Under Alternative 2, impacts would also include delays in access to the Ediz Hook Boat Launch during construction, and a potential reduction or degradation of marine habitat. Relative to the other action alternatives, Alternative 2 has the shortest construction window (12 months, as opposed to 18 months for Alternative 1 and 14 months for Alternative 3). It would have the least amount of permanent seafloor disturbance at (209 ft^2), compared to 745 ft^2 for Alternative 1 and 218 ft^2 for Alternative 3. At 29,976 ft^2, the amount of overwater coverage for Alternative 2 is between the coverage for Alternative 1 (24,465 ft^2) and Alternative 3 (33,136 ft^2).

Under Alternative 2, the proposed treaty mitigation and long-term positive impacts in Port Angeles Harbor would be the same as those under Alternative 1. However, because the Alternative 2 design utilizes the proposed compensatory mitigation site, if this alternative is selected, other compensatory mitigation would need to be developed in consultation with the USACE.

Conclusion

As with the other action alternatives, neither the short-term impacts (i.e., delays in access associated with construction traffic) nor the long-term impacts (i.e., a reduction or degradation of marine habitat) would be significant under Alternative 2.

3.6.3.3 Alternative 3: Eastern Site

Under Alternative 3, impacts would also include delays in access to the Ediz Hook Boat Launch and result in a reduction or degradation of marine habitat. Relative to the other action alternatives, Alternative 3 has a construction window of 14 months, similar to the 12-month window for Alternative 2 and less than the 18-month window for Alternative 1. It would have a similar amount of permanent seafloor disturbance at (218 ft^2), compared to Alternative 2 (209 ft^2), and less than that of Alternative 1 (745 ft^2). At 33,136 ft^2, the amount of overwater coverage for Alternative 3 is more than that of both Alternative 1 (24,465 ft^2) and Alternative 2 (29,976 ft^2).

Conclusion

As with the other action alternatives, neither the short-term impacts (i.e., delays in access associated with construction traffic) nor the long-term impacts (i.e., a reduction or degradation of marine habitat) would be significant under Alternative 3.

3.6.3.4 No Action Alternative

Under the No Action Alternative, the TPS project along Ediz Hook would not occur, and there would be no change to or any effect on tribal resources. Therefore, no significant impacts on American Indian traditional resources would occur with implementation of the No Action Alternative.

3.7 Socioeconomics

Socioeconomic topics were identified for analysis in this EA based on relevance to the Proposed Action and association with human activities and livelihoods in the area. Each of these socioeconomic resources is an aspect of the human environment that involves economics (e.g., employment, income, or revenue) and social conditions (e.g., enjoyment and quality of life) associated with the natural or physical environment of the area in the vicinity of the project area. This evaluation considered potential impacts on the following socioeconomic resources of the area:

- Population and housing.
- Area economy including income, employment, and taxes.
- Environmental justice populations.
- Commercial and recreational fisheries.
- Aquaculture.

Potential impacts on harvestable marine resources and tribal treaty rights (access to U&A fishing areas) are addressed in Section 3.6, *America Indian Traditional Resources*.

3.7.1 Regulatory Setting

EO 12898 (*Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*) requires each federal agency to make achieving environmental justice part of its mission. Specifically, the agency must identify and address "to the greatest extent practicable and permitted by law" the disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations.

3.7.2 Affected Environment

3.7.2.1 Regional and Local Socioeconomic Characteristics

Population and Housing

USCG AIRSTA/SFO Port Angeles is located in the City of Port Angeles and Clallam County. Clallam County had an estimated 2014 population of 72,715 (U.S. Census Bureau 2015). The Office of Financial Management (OFM) projects that Clallam County could have a population increase of up to 5,493 persons (or 7.5 percent growth) to a total population of approximately 78,208 by 2040 (OFM 2012).

Port Angeles had an estimated 2014 population of 19,256 (U.S. Census Bureau 2015). This was a 6 percent increase from a 2000 Census population of 18,472. If the city grows at the same rate, there would be 20,700 individuals in Port Angeles by the year 2040. Approximately 250 to 300 USCG personnel in seven units are currently assigned to USCG AIRSTA/SFO Port Angeles, and many of these live either temporarily or permanently in the area.

The total number of housing units in Clallam County was 35,566 in 2013, of which 13 percent were vacant (U.S. Census Bureau 2015). The total number of housing units in Port Angeles was 9,382 in 2013, of which 11 percent were vacant (U.S. Census Bureau 2013). Several hotels/motels and short-term rentals are located in downtown Port Angeles near the PoPA. At least five recreation vehicle parks are also located within or near Port Angeles along U.S. Highway 101.

Area Economy

The median household income in the County in 2013 was estimated at $46,033. In this same period, the unemployment rate was 11 percent, and 14.6 percent of the county's population was living below the poverty level (U.S. Census Bureau 2013). The most recent unemployment rate released by the Bureau of Labor Statistics for the county for March 2015 was 8.3 percent (Bureau of Labor Statistics 2015).

The median household income in Port Angeles in 2013 was estimated at $39,577, 14 percent lower than for the county as a whole. In this same period, the unemployment rate was 11.9 percent, and 18 percent of the city's population was living below the poverty level. The city's population living below the poverty level was 3.4 percent higher than for Clallam County (U.S. Census Bureau 2013).

The predominant industries in the county and Port Angeles in 2013 were educational services, and health care and social assistance, which employed 23 and 22.4 percent of the labor force, respectively. The retail trade sector employed 12.1 percent in the county and 15.2 percent in the city. The arts, entertainment, recreation, accommodation, and food services industries employed 10.6 percent of the population in the county and 8.5 percent in the city (U.S. Census Bureau 2013). The armed forces labor force was 0.7 percent in the county and 1.4 percent in Port Angeles, with the majority employed at USCG AIRSTA/SFO Port Angeles.

Employment by industry in the city was similar to that of the county as a whole, with the exception that a greater proportion of the city's population was employed in the manufacturing industry. Nippon Paper Industries USA has a large manufacturing facility on the Ediz Hook peninsula and is an important source of employment in the area.

Taxes are an important source of revenue for both the state and local jurisdictions. The state sales and use tax in Washington is 6.5 percent. The Port Angeles and unincorporated county sales and use tax is 1.9 percent (Washington Department of Revenue 2015).

Port Angeles Harbor is a deep water harbor and is utilized by commercial shipping vessels (tankers, dry bulk cargo vessels, and log barges) travelling between the Strait of Juan de Fuca and the PoPA. The movement of these vessels is essential to the local manufacturing industry. Bulk cargo vessels and ocean log barges transport forest products from the port and are essential to the operation of the Nippon Paper Industries USA plant. Crude oil and petroleum tankers also use the port for topside repair. Port Angeles Harbor vessel traffic exports were $70 million, and imports were $15 million in 2013 (CAI 2013).

3.7.2.2 Environmental Justice

Environmental justice (EJ) populations, as referenced in EO 12898, include minority and low-income populations. To assess potential EJ concerns, EJ populations were identified by comparing minority and low-income population percentages within the project area census tracts (CTs) to county reference populations. The project area includes CTs 7, 8, 9 10, and 12 (Figure 3.7-1), which include Ediz Hook and the shoreline areas across the harbor from AIRSTA/SFO Port Angeles.

CTs with minority or low-income populations equal to or greater than those in the county reference population were identified. In these areas, the potential exists for EJ populations to experience disproportionate adverse effects.

As shown in Table 3.7-1, minority populations and low-income populations were identified in all CTs. The following EJ populations within the project area CTs were greater than the populations within Clallam County: African American in CTs 7 and 8; Native American or Alaskan Native in

CT 9; Asians or Pacific Islander in CTs 7 and 10; other minorities in CT 9; two or more races in CTs 8 and 10; Hispanic or Latino in CTs 8 and 9; and low-income populations in CTs 7, 8, 9, and 12.

Table 3.7-1. Summary of Environmental Justice Populations

Geography[1]	Total Population	African American	Native American or Alaskan Native	Asian or Pacific Islander	Other	Two or more Races	Hispanic or Latino	Population Below Poverty Level
Washington	6,819,579	3.6	1.4	7.9	3.9	4.8	11.5	13.4
Clallam County	71,731	1.0	5.1	1.6	0.7	3.5	5.4	14.6
Port Angeles	19,099	1.6	2.6	2.3	0.5	4.0	4.1	18.0
CT 7	4,087	1.2[2]	1.1	2.6[2]	0.0	1.1	3.7	18.6[2]
CT 8	4,143	2.5[2]	1.4	0.0	0.6	6.0[2]	6.9[2]	18.9[2]
CT 9	2,694	0.4	8.5[2]	0.7	0.7[2]	1.8	5.5[2]	21.3[2]
CT 10	2,420	0.4	0.5	3.1[2]	0.4	5.8[2]	2.7	12.8
CT 12	3,564	0.2	3.3	1.8	0.3	1.2	1.3	15.2[2]

Notes:
[1] CT = Census Tract.
[2] Denotes minority or low income population that was equal to or greater than that population within Clallam County.
Source: U.S. Census Bureau 2013.

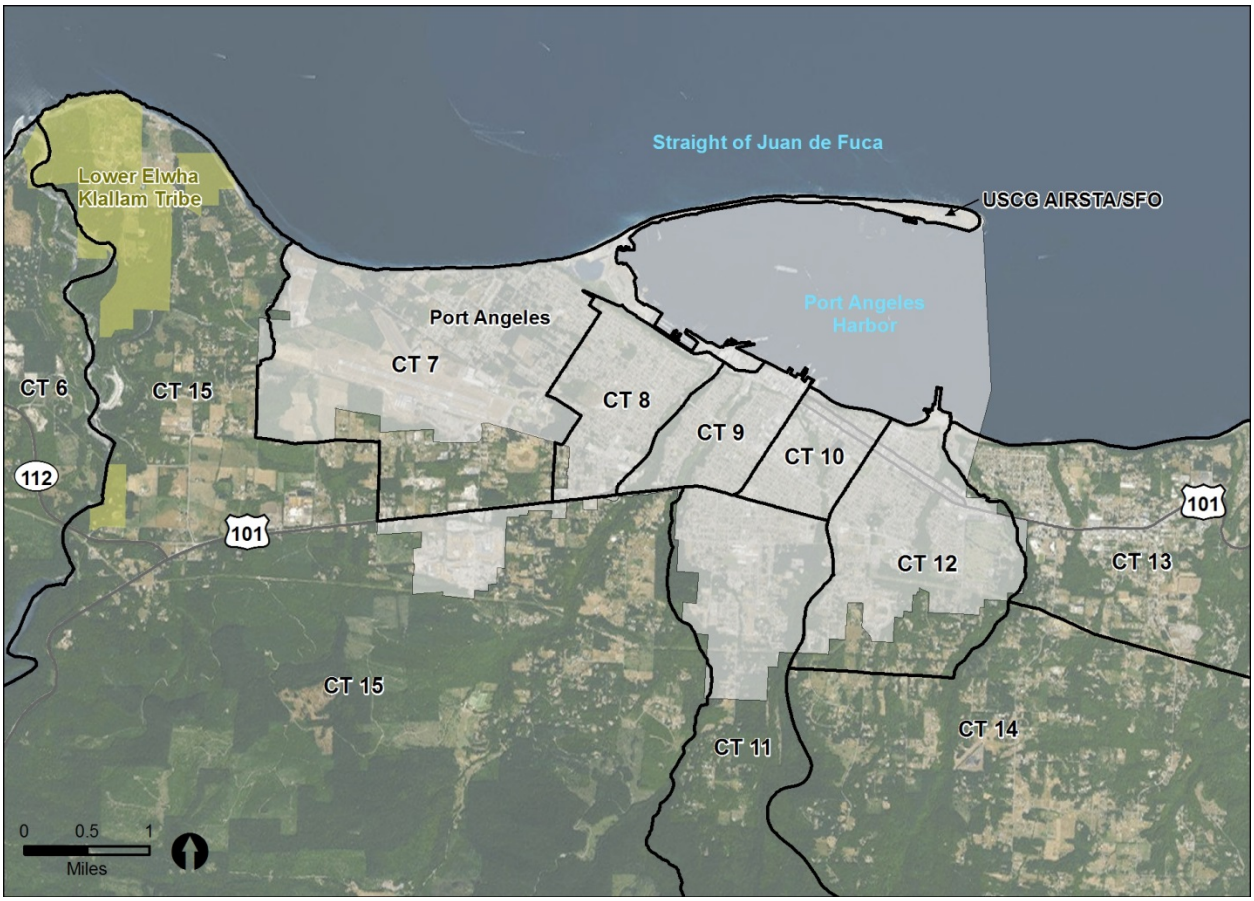

Figure 3.7-1. Census Tracts in the Project Area

3.7.2.3 Commercial and Recreational Fisheries

Fisheries are defined as the commercial or recreational harvest of marine life for consumption or sport. Fisheries can be commercial where the harvest is sold and recreational where it is either kept for personal consumption or released. Port Angeles Harbor and the Strait of Juan de Fuca support commercial and recreational fisheries for salmon, Dungeness crab, sea urchin, sea cucumber, and Pacific herring. Commercial and recreational fisheries support local and tourist-related employment, income, and tax revenues for Clallam County and Port Angeles.

Commercial Fishery

According to the Pacific Fisheries Information Network (PacFIN 2013), approximately 624 registered commercial fishing vessels in 2013 landed about 6.9 million pounds of fish, with a gross value of almost $17.3 million in Clallam County. In 2013, personal income from fishing accounted for 3.4 percent of total wages and salaries earned in Clallam County and Port Angeles (U.S. Census Bureau 2013).

The commercial fisheries in the Strait of Juan de Fuca include salmon, Pacific herring, Dungeness crab, shrimp, shellfish, sea cucumber, sea urchin, spot prawn, whiting, smelt, and Pacific sardine (WDFW 2014c). Harvest quotas are set for some of these species (e.g., salmon and sardines) by the PFMC, while others are managed directly by WDFW. Harvest is managed by WDFW based on seasonal opening, quotas, licenses, and close monitoring of actual catch volumes. For some species, there is no fishery in this area. For example, the salmon fishery is closed within 3 miles of shore for the entire Strait of Juan de Fuca as part of the Strait of Juan de Fuca Preserve (WDFW 2014c), and whiting are a deep-water species harvested with trawl nets. However, the entire Port Angeles Harbor area is open for commercial shrimp harvesting via both set traps and trawl methods.

Recreational Fishery and Tourism

The recreational fishery in Port Angeles Harbor and the Strait of Juan de Fuca is used by both the local population and tourists. The harbor is open for fishing and seasonally open for recreational crab harvest. However, the harvest of bivalve shellfish (clams, oysters, mussels, and other invertebrates) is prohibited in the harbor due to contamination.

Several fishing guides and charters in Port Angeles and the surrounding areas in the county support the tourism industry, including whale watching charters. The arts, entertainment, recreation, accommodation, and food services industries employed 10.6 and 8.5 percent of the population in Clallam County and Port Angeles, respectively, in 2013 (U.S. Census Bureau 2013). While the local economic impacts from recreational fisheries are unknown, a 2009 statewide tourism report found that visitor spending amounted to approximately $179.4 million in Clallam County, with earnings of $53.4 million and employment of 2,977 (Dean Runyan Associates 2009). Visitor spending would include whale watching and other recreational activities. At the state level in 2011, there was approximately $1.1 billion in economic activity from sport fishing with 14,655 associated jobs (WDFW 2011).

A public boat launch is maintained on Ediz Hook by PoPA about 180 feet west of the existing USCG AIRSTA/SFO security gate, and there are two boat launches across the harbor at the city pier and PoPA Boat Haven Marina. During 2013 and 2014, The highest seasonal rate of use at the Ediz Hook Boat Launch was in May, when daily boat counts at this ramp exceeded 100, which in turn brought more than 300 anglers (WDFW 2014a). There are also numerous access points for fishing from shore.

Aquaculture

Aquaculture is the raising for sale of seafood in a fixed, maintained environment (commercial fish pens) or on specifically designated sites (shellfish beds). A variety of species are raised for sale, but the most common in Puget Sound are shellfish and salmon. Because of the contamination concerns, there are no commercial shellfish operations in Port Angeles. Icicle Seafoods raises Atlantic salmon in a fish-pen array off shore from AIRST/SFO Port Angeles (see Figure 1-3). This facility employs five full-time and two part-time staff (Ecology 2005). At any given time there can be between 3.5 and 4.5 million pounds of fish present in these pens, and annual production can reach 4.5 million pounds of fish (Icicle Seafoods 2012).

This level of production generates between $14 and $17 million in revenue (depending on the price of salmon) from sales to wholesale customers for each crop of fish. DNR receives revenue in turn annually from the lease of the aquatic lands to Icicle Seafoods. It takes about 18 months to raise a fish to market size (10 lbs cleaned; 12 lbs live weight); the facility only has one crop of fish all of the same age in the pens at one time (Cook 2015). This facility has been in place for approximately 20 years and is currently operating on a lease granted by DNR that extends through September 2025. The Icicle Seafoods' fish pen array is comprised of 20 individual fish pens in the harbor. Each pen is a square about 79 feet long on each side and 45 feet deep. The number of fish in each pen varies based on their size and the cleaning cycle of the pen. At harvest time, each pen can house about 27,000 market-ready Atlantic salmon (12 lbs).

3.7.3 Environmental Consequences

The evaluation of socioeconomics considers impacts on the local population, housing, area economy, environmental justice populations, commercial and recreational fisheries, and aquaculture during construction and operation.

Impacts on socioeconomics would be considered significant if:

- There would be long-term changes to facilities or operations that could alter the socioeconomic character or stability of the project area.
- There would be disproportionately high and adverse environmental or socioeconomic impact on minority or low-income populations.

3.7.3.1 Economic Impacts Approach

The direct, indirect, and induced economic effects of the alternatives were assessed using the Impact Analysis for Planning (IMPLAN) model. Direct effects are the net increases in spending and their effects on employment and income. Indirect effects are the inter-industry linkages that occur when industries purchase goods or services from other industries generating employment and income. Induced effects occur when household consumption spending generates additional income and employment in the economy.

The IMPLAN model uses data from the U.S. Bureau of Labor Statistics and the U.S. Bureau of Economic Analysis to construct a mathematical representation of a local economy, in this case Clallam County, using region-specific spending patterns, economic multipliers, and industries. This model relies on an input-output model approach, which represents the various sectors of the economy and the interrelationships between those sectors. The model produces multipliers that allow the determination of direct, indirect, and induced effects based on the costs of construction and operation (maintenance operations only).

Total construction costs by alternative include costs to construct the facilities and the estimated environmental mitigation. Total annual operating costs by alternative include annual

maintenance, utilities, and other operating costs. Initial construction costs for each alternative were derived based on the following:

Alternative 1: The cost includes construction of a pile-supported approach trestle and pier specifically designed to fit the purpose and need for the project with a minimum predicted 50-year life span. The cost also includes construction of the upland Alert Forces Facility.

Alternative 2: The cost includes procurement and refit of a pontoon from the State Route 520 floating bridge project and an access trestle. The State Route 520 pontoons were constructed prior to 1963 for use in fresh water. Due to the relatively poor structural condition of the pontoons, it has been determined that they should not be dry-docked for refit. Therefore, the cost includes application of a crystalline waterproofing agent to the interior of the pontoon and installation of interior cofferdams to slow flooding. Due to the age and structural condition of the used pontoon, along with the conversion to salt water use, the predicted life span is a maximum of 15 years. The cost also includes construction of the upland Alert Forces Facility.

Alternative 3: The cost includes the same pontoon and Alert Forces Facility costs as Alternative 2, as well as the cost of construction of a wave screen to protect the floating pontoon from wave action.

Economic impacts are analyzed by introducing a change to a specific industry in the form of increased employment or spending; the IMPLAN model mathematically calculates the resulting changes in the local economy. In this analysis, the IMPLAN model estimates the economic effects of the estimated number of construction workers, construction expenditures, and the operations personnel on spending and employment in Clallam County.

For the operations analysis, the results indicate what the employment, income, and economic output would be for maintenance of the proposed facilities (outside vendors that would conduct maintenance on the facilities).

Tables 3.7-2 and 3.7-3 show the results of the modeling, which are described in more detail under each of the alternatives.

Table 3.7-2. Construction Impacts by Alternative

Alternative	Construction Costs ($ million)	Employment	Wages ($ million)	Output ($ million)
Alternative 1	$27.0	267	$10.5	$38.1
Alternative 2	$30.7	304	$12.0	$43.3
Alternative 3	$33.6	332	$13.1	$47.4

Table 3.7-3. Operation Impacts by Alternative

Alternative	Annual Operation Costs for Proposed Facilities	Annual Wages	Annual Output
Alternative 1	$180,000	$72,280	$274,214
Alternative 2	$220,000	$88,342	$335,151
Alternative 3	$220,000	$88,342	$335,151

3.7.3.2 Alternative 1: Midwestern Site (Preferred Alternative)

Population and Housing

Construction/Short-term Impacts

Under Alternative 1, construction would take place over approximately 18 months, and construction activities are expected to generate up to 174 direct skilled and unskilled construction jobs at its peak. An additional 93 indirect and induced jobs may result from construction (for a total of 267 jobs). Various building trades would be required during construction. Though uncertain, the construction labor pool for direct, indirect, and induced construction positions would likely be local-unionized labor. Temporary housing demand would not increase beyond the current capacity of regional accommodations, as most workers would likely reside in the region and could commute to work.

Operation/Long-term Impacts

Alternative 1 would not increase the permanent population in any appreciable way. The TPS crews would be working between Bangor and Port Angeles, and a few crew members could reside in Port Angeles or the general area and commute. However, most of the crew would stay at the AFF when in Port Angeles. There is adequate alternative housing in Port Angeles and Clallam County to accommodate the entire TPS crews if necessary. No impact on housing is anticipated.

Area Economy

Construction/Short-term Impacts

The estimated direct, indirect, and induced impacts on the area economy from the estimated $27 million in construction costs include the beneficial effects of added employment for 267 workers with wages of $10.5 million over the construction period. Economic output from Alternative 1 during construction was estimated at $38.1 million. According to the IMPLAN model, construction could generate $2.6 million in federal taxes and $1.7 million in state and local taxes.

While some skilled and specialist construction positions would be filled by people outside the local area, most construction positions would likely be filled locally. Construction job creation would boost income locally and regionally, which would result in induced effects such as increased spending on goods and services. With a large proportion of the county and city labor force working in the retail trade, entertainment, food, accommodation, and health care industries, these indirect and induced effects would benefit the local economy. Construction would also benefit the local and regional economy through spending on materials, transportation, and other equipment acquisitions and rentals. Construction materials would generally be sourced from the region.

Operation/Long-term Impacts

Direct, indirect, and induced effects would accrue from annual operation costs for maintenance of the proposed facilities. Local workers in the retail trade, entertainment, food, accommodation, and health care industries are the most likely to benefit from indirect and induced effects during operations. Operations would contribute directly and indirectly to the economy through an estimated $180,000 in annual operation costs for maintenance of the proposed facilities. The estimated direct, indirect, and induced impacts from annual operating costs include wages of about $72,000 and an economic output of about $274,000. While accommodations would be provided at the AFF for TPS personnel, crews would likely utilize restaurants, grocery outlets, and other retail establishments in Port Angeles. According to the IMPLAN model, operation could generate $17,498 annually in federal taxes and $12,770 in state and local taxes.

Environmental Justice

Construction/Short-term Impacts

Even though there are minority and low-income populations in the general vicinity of the project area, none are located on Ediz Hook, and the nearest populations are over one mile from the project site. Construction traffic from the project site would use Marine Drive and State Route 117, routes that would neither pass through nor affect residential areas. As described in Section 3.4.3, construction noise is exempt from the maximum permissible noise levels defined by Washington State and would not be a significant impact on any population. Impacts on air quality and public safety would be negligible (see Section 1.4). Construction would have no disproportionately high and adverse human health or environmental effects on minority and low-income populations.

There could be some beneficial effects to EJ populations during construction from increased employment opportunities, as well as construction workers spending money at establishments owned by minorities.

Operation/Long-term Impacts

After construction, noise from operation of the pier and facilities would attenuate to ambient noise levels at the closest residences. Impacts on air quality and public safety would be negligible (see Section 1.4). Operation would not have any disproportionately high and adverse human health or environmental effects on minority and low-income populations. There could be some beneficial effects from increased spending if that spending occurs in a minority-owned establishment or results in employment for low-income or minority persons.

Commercial and Recreational Fisheries

Construction/Short-term Impacts

Construction activities would not impact commercial fishing.

Operation/Long-term Impacts

Because the area around AIRSTA/SFO Port Angeles is not used for commercial fishing, there would be no impact on commercial fishing. Recreational fishing may occasionally occur near the site, but typically this area is not heavily used due to its proximity to the boat launch and base facilities. Alternative 1 could preclude any fishing within 100 yards of any moored vessels at the site because of the NVPZ. Because of the proximity to numerous other fishing sites, operation would not impact recreational fishing or tourism-related water-oriented activities such as whale watching.

Aquaculture

Construction/Short-term Impacts

Based on information provided by Icicle Seafoods, this section analyzes three types of short-term impacts on commercial fish production at Icicle Seafoods (Icicle Seafoods 2015; Cook 2015):

- Loss of approximately 2 months of rearing time (due to early harvest) at the end of the current fish production cycle.
- Commercial fish pens being left fallow for 11 weeks rather than the normal 4 to 6 weeks.
- The effects of vibratory pile driving on the subsequent fish rearing production cycle, which would occur from approximately July 15, 2016 to February 15, 2017.

Loss of Rearing Time

The analysis of financial impacts on Icicle Seafoods assumes that no fish would be present in the commercial fish pens during impact pile driving, which would occur from December 1, 2016 to February 15, 2017. The current 18-month cycle of fish rearing began in May 2015 and is anticipated to end in December 2016. For no fish to be present during pile driving, Icicle Seafoods would need to begin to harvest fish approximately 2 months early (after 16 months of rearing) for its current rearing cycle. Harvest would be assumed to begin on November 1, 2016 and take a few days or weeks to complete. Sale of the fish 2 months early could affect the monetary value of the fish in two ways: early harvest of fish would mean that the fish would be a smaller size and may be sold at a lower price per pound; secondly, the overall net weight of the fish would be less than if the fish were reared for the entire 18 months.

The monetary value of the lost fish biomass at the time of harvest was estimated assuming that fish in this size class could be sold at wholesale prices ranging from $2 per pound to $3 per pound. The exact price would be determined by market conditions at the time of harvest and sale. However, $2 to $3 per pound appears to be a reasonable estimate based on historical market conditions (Knapp 2013). Data provided by Icicle Seafoods indicate that the total biomass of the fish at the end of December 2016 would be 2,843,500 kilograms or 6,268,800 lbs. If harvest begins at the beginning of November 2016, the total biomass of fish would be 5,342,700 lbs (Icicle Seafoods 2015). The Navy estimates that the difference between harvest at the beginning of November 2016 and the end of December 2016 would be up to $3 million. However, Icicle Seafoods estimates that the direct loss of economic value from an early harvest could exceed $6 million and negatively impact relationships with customers. If an early harvest does not occur or implementation of impact pile driving is delayed and occurs when the fish are in the pens, the loss of economic value could exceed $18 million. None of these estimates accounts for the cost savings for the fish food and other expenses not required during that 2-month period. The potential reduction in revenue would also affect the revenues to DNR from the lease of the aquatic lands to Icicle Seafoods

Increased Duration of Between Rearing Cycles

This analysis also assumes that the pens would be fallow for approximately 11 weeks, and that a normal rearing cycle would begin again after February 15, 2017. This is in comparison to a typical 4- to 6-week fallow period following each harvest. Conservatively, this would mean 7 weeks when the pens would be fallow beyond the typical duration. The economic effect of seven weeks of fallow pens would likely include the cost to retain and pay staff for their normal

work hours while no fish are being reared. The next harvest would be delayed by 7 weeks, which would be delayed profit for Icicle Seafoods and a potential decrease of revenues to DNR.

Effects of Vibratory Pile Driving

Vibratory pile driving would occur from approximately July 15, 2016 to February 15, 2017. The vibratory pile-driving hammer has a set of jaws that clamp onto the top of the pile. The pile is held steady while the hammer vibrates the pile to the desired depth. Because vibratory hammers are not impact tools, noise levels are typically not as high as with impact pile drivers. Since vibratory pile drivers typically generate noise levels lower than impact pile drivers and do not produce waveforms with sharp rise times like impact pile driving, impacts on fish are typically not observed in association with vibratory pile driving (WSDOT 2015). Impacts on fish at Icicle Seafoods rearing pens are not anticipated as a result of vibratory pile driving.

Operation/Long-term Impacts

Icicle Seafoods accesses its facilities via small boats operating out of a shore-side facility adjacent to the Ediz Hook Boat Launch. Icicle Seafood vessels would normally be permitted to transit within the NVPZ in accordance with 33 CFR Part 165. See Section 3.8, *Marine Traffic and Transportation*, for more information. However, Icicle Seafoods has indicated that required coordination for access within the NVPZ and the presence of military personnel in the area could have a “chilling effect” on its personnel.

Aquaculture facility locations are chosen based primarily on current velocities at a site, with optimal sites having water velocities of 4 to 24 inches/second (Rensel et al. 2007). Current velocities at the site are approximately 9 to 10 inches/second. To improve conditions, Icicle Seafoods currently runs compressors in the summer to locally improve water quality (Cook 2015). As described in Section 3.2, *Water Quality and Sediments*, construction and operation of the pier would create localized nearshore water circulation impacts near the piling; however, Alternative 1 is not expected to affect the longshore currents in the area of the Icicle Seafoods fish pens.

Under this alternative the pier would extend into the area leased by DNR to Icicle Seafoods. There is no proposed reduction in the leased area associated with the project. However, should a long-term loss of seafood production or reduction in the leased area occur, the project would result in reduced revenues to Icicle Seafoods and DNR.

Implementation of the proposed treaty mitigation could eliminate the lease the City of Port Angeles holds with Icicle Seafoods for the upland portion of its laydown area, resulting in reduced lease revenues to the city.

Conclusion

Alternative 1 would not result in an increase of any permanent population. Because housing is available, any TPS personnel requiring off base housing would not create a shortage of housing in the area. The area economy would realize a temporary benefit from increased employment and wages during construction and the spending for purchase of goods and services in the vicinity of the project area. There would also be some benefits during operation from local spending by TPS personnel and outside vendors that would conduct maintenance on the proposed facilities. There would be no disproportionate impact on minority or low-income persons. Alternative 1 would not affect commercial or recreational fishing. Predicted impacts of early harvest of Icicle Seafoods commercial fish due to pile driving range from $3 million based on Navy estimates to greater than $6 million based on Icicle Seafoods estimates, with much larger impacts if an early harvest does not occur or impact pile driving is delayed. The next

harvest after pile driving is complete would be delayed by approximately 7 weeks, which is anticipated to result in delayed profit for Icicle Seafoods. Reduced revenues to Icicle Seafoods would potentially result in a decrease of revenues to DNR, and potential elimination of the lease the City of Port Angeles holds with Icicle Seafoods for the upland portion of its laydown area could result in reduced lease revenues to the city.

3.7.3.3 Alternative 2: Western Site

Population and Housing

Construction/Short-term Impacts

Under Alternative 2, construction would take place over a 12-month period, and construction activities are expected to generate up to 198 direct skilled and unskilled construction jobs at its peak. An additional 106 indirect and induced jobs may result during construction (for a total of 304 jobs). Various building trades would be required during construction. Though uncertain, the construction labor pool for direct, indirect, and induced construction positions would likely be local-unionized labor. Temporary housing demand would not increase beyond the current capacity of regional accommodations as most workers would reside in the region and could commute to work.

Operation/Long-term Impacts

Operation impacts on population and housing would be similar to those described for Alternative 1.

Area Economy

Construction/Short-term Impacts

Construction would benefit the area economy, similar to Alternative 1. Economic benefits under Alternative 2 would be greater than Alternative 1 because of the higher construction costs. The estimated direct, indirect, and induced impacts from the $30.7 million in construction costs would provide 304 jobs with wages of $12 million over the construction period. Economic output from Alternative 2 during construction was estimated at $43.3 million. According to the IMPLAN model, construction could generate $2.9 million in federal taxes and $1.9 million in state and local taxes.

Operation/Long-term Impacts

Direct, indirect, and induced effects would result from annual operation costs for maintenance of the proposed facilities, similar to Alternative 1. However, since operation costs would be slightly higher for Alternative 2, there would be greater benefits to the area economy. Operations would contribute directly and indirectly to the economy through an estimated $220,000 in annual operation costs for maintenance of the proposed facilities. The estimated direct, indirect, and induced impacts from annual maintenance operations include wages of about $88,000 and an economic output of about $335,000. According to the IMPLAN model, operation could generate $21,386 in federal taxes and $15,609 in state and local taxes annually.

Environmental Justice

Construction/Short-term Impacts

Construction impacts on environmental justice populations would be similar to those described for Alternative 1.

Operation/Long-term Impacts

Operation impacts on environmental justice populations would be similar to those described for Alternative 1.

Commercial and Recreational Fisheries

Construction/Short-term Impacts

Construction impacts on commercial and recreational fisheries would be similar to those described for Alternative 1.

Operation/Long-term Impacts

Operation impacts on commercial and recreational fisheries would be similar to those described for Alternative 1.

Aquaculture

Construction/Short-term Impacts

Construction impacts on aquaculture would be similar to those described for Alternative 1. The fish pens are located close enough to the pile driving that fish would be killed or injured during pile driving. However, under Alternative 2, the in-water construction duration would be shorter – 5 weeks for Alternative 2 as compared to 18 weeks for Alternative 1. If the fish were harvested early, impacts would be similar to those described for Alternative 1, including revenue losses to Icicle Seafoods and DNR.

Operation/Long-term Impacts

Operation impacts on aquaculture would be similar to those described for Alternative 1. There would be some localized changes in water circulation from the floating pontoon and piles. However, since there would be fewer piles, the effects on localized circulation would be less.

Implementation of the proposed treaty mitigation could eliminate the lease the City of Port Angele holds with Icicle Seafoods for the upland portion of its laydown area, resulting in reduced lease revenues to the city.

Conclusion

Similar to Alternative 1, Alternative 2 would not result in any increase in permanent population or adversely affect the supply of housing in the area. The area economy would benefit from construction and operation and provide greater economic benefits when compared to the No Action Alternative or Alternative 1. There would be no disproportionate impact on minority or low-income persons. Impacts on commercial and recreational fishing and tourism would be similar to Alternative 1. Impacts of early harvest of Icicle Seafoods commercial fish due to pile driving would be similar to those described for Alternative 1. The next harvest after pile driving is complete would be delayed by approximately seven weeks, which is anticipated to result in delayed profit for Icicle Seafoods and a potential decrease of revenues to DNR. The potential elimination of the lease the City of Port Angeles holds with Icicle Seafoods for the upland portion of its laydown area could result in reduced lease revenues to the city.

3.7.3.4 Alternative 3: Eastern Site

Population and Housing

Construction/Short-term Impacts

The construction period for Alternative 3 falls between that of Alternatives 1 and 2, and is estimated at 14 months. This alternative has the highest construction costs and is expected to generate the most jobs. It is estimated that up to 216 direct skilled and unskilled construction jobs would be generated. An additional 116 indirect and induced jobs may result during construction (for a total of 332 jobs). Similar to Alternatives 1 and 2, various building trades would be required during construction and most of the construction positions would likely be filled with local-unionized labor, with the benefits of this employment accruing to the local area.

Operation/Long-term Impacts

Operation impacts on population and housing would be similar to those described for Alternative 1.

Area Economy

Construction/Short-term Impacts

Alternative 3 would benefit the economy the most, as compared to the other alternatives, because of the higher construction costs. The estimated direct, indirect, and induced impacts from the $33.6 million in construction costs include 332 workers with wages of $13.1 million over the construction period. Economic output from Alternative 3 during construction was estimated at $47.4 million. According to the IMPLAN model, construction could generate $3.2 million in federal taxes and $2.1 million in state and local taxes.

Operation/Long-term Impacts

Direct, indirect, and induced effects would result from annual operation costs and would be similar to those under Alternative 2 since the operating costs would be the same. Therefore, operations would contribute directly and indirectly to the economy through $220,000 in annual operation costs for maintenance of the proposed facilities. The estimated direct, indirect, and induced impacts from annual operation costs include wages of about $88,000 and economic output of about $335,000. According to the IMPLAN model, operation could generate $21,386 in federal taxes and $15,609 in state and local taxes annually.

Environmental Justice

Construction/Short-term Impacts

Construction impacts on environmental justice populations would be similar to those described for Alternative 1.

Operation/Long-term Impacts

Operation impacts on environmental justice populations would be similar to those described for Alternative 1.

Commercial and Recreational Fisheries

Construction/Short-term Impacts

Construction impacts on commercial and recreational fishing would be similar to those described for Alternative 1.

Operation/Long-term Impacts

Operation impacts on commercial and recreational fishing would be similar to those described for Alternative 1. Because of the distance of the Alternative 3 site from the Icicle Seafoods fish pens and the NVPZ, Alternative 3 would have the least impact on the company's access to the pens.

Aquaculture

Construction/Short-term Impacts

Alternative 3 would have the least impact on aquaculture due to the distance of the proposed TPS pier from the fish pens. The TPS pier site would be more than 3,000 feet from the fish pens. Impacts on fish at Icicle Seafoods rearing pens are not anticipated as a result of vibratory pile driving.

Construction impacts on commercial fishing would be similar to those described for Alternative 1.

Operation/Long-term Impacts

Operation impacts on aquaculture would be less than those under Alternatives 1 and 2. There would be some localized changes in water circulation from the floating pontoon and breakwater. However, the pontoon and breakwater would be more than 3,000 feet away from the fish pens, and at that distance circulation around the fish pens would not be affected.

Implementation of the proposed treaty mitigation could eliminate the lease the City of Port Angeles holds with Icicle Seafoods for the upland portion of its laydown area, resulting in reduced lease revenues to the city.

Conclusion

Similar to Alternatives 1 and 2, Alternative 3 would not result in any increase in permanent population or adversely affect the supply of housing in the area. The area economy would benefit from construction and operation and provide greater economic benefits than the No Action Alternative or Alternatives 1 and 2. There would be no disproportionate impact on minority or low-income persons. Impacts on commercial and recreational fishing and tourism would be similar to those under Alternative 1. Aquaculture would not be adversely affected by construction due to the distance from the site. Impacts on fish at the Icicle Seafoods rearing pens are not anticipated as a result of vibratory pile driving. Implementation of the proposed treaty mitigation could eliminate the lease the City of Port Angeles holds with Icicle Seafoods for the upland portion of their laydown area, resulting in reduced lease revenues to the city.

3.7.3.5 No Action Alternative

Under the No Action Alternative, a TPS forward-deployed operational pier would not be constructed, and there would be no impacts on population, housing, the area economy, environmental justice, commercial and recreational fisheries, or aquaculture.

3.8 Marine Traffic and Transportation

This section provides an overview of the regulatory requirements for vessel navigation and the safety framework for marine transportation within Port Angeles Harbor; describes existing marine traffic within the harbor; and assesses the impact of construction and operation of the Proposed Action on marine transportation.

3.8.1 Regulatory Setting

3.8.1.1 Protection of Navy Vessels

The Code of Federal Regulations (33 CFR 165.2010 to 165.2030) *Navigation and Navigable Waters* (Navigation Rules) establishes the geographic parameters for vessel protection zones surrounding Navy vessels in the navigable waters of the U.S. A Naval Vessel Protection Zone (NVPZ) is a 500-yard regulated area of water surrounding large U.S. Navy vessels (greater than 100 feet in length overall) that is necessary to provide for the safety or security of these Navy vessels. An NVPZ exists around all such Navy vessels at all times in the navigable waters of the U.S., whether the Navy vessel is underway, anchored, moored, or within a floating dry dock, except when the Navy vessel is moored or anchored within a restricted area or within a naval defensive sea area.

When another vessel is within an NVPZ, it is required to operate at the minimum speed necessary to maintain a safe course (unless required to maintain speed by the Navigation Rules) and should proceed as directed by the USCG, the senior naval officer present in command, or the official patrol. When within an NVPZ, no vessel or person is allowed within 100 yards of a large Navy vessel unless authorized by the USCG, the senior naval officer present in command, or official patrol. The USCG can authorize access within the 100-yard zone via a Captain of the Port Agreement. Nothing relieves any vessel, including Navy vessels, from observance of the Navigation Rules. The rules and regulations concerning NVPZs supplement, but do not replace or supersede, other regulations pertaining to the safety or security of Navy vessels.

3.8.1.2 Puget Sound Harbor Safety Plan

The Puget Sound Harbor Safety Plan provides information, guidelines, and standards for marine operations in Puget Sound, including those within Port Angeles Harbor. The goal of the plan is to enhance marine safety and environmental stewardship via risk-based decision making. The plan was prepared by the Puget Sound Harbor Safety Committee (PSHSC), which is comprised of representatives of governmental agencies, maritime labor and industry organizations, and public interest groups. Advisors to the PSHSC include the USCG and Navy (PSHSC 2014).

Standards and protocols in the Puget Sound Harbor Safety Plan address operational and environmental issues unique to Puget Sound. The plan is intended to complement existing regulations by advising the mariner of unique conditions and requirements that may be encountered in Puget Sound and adjacent waters, and the standards and protocols developed by local experts for ensuring greater safety in light of those conditions and requirements (PSHSC 2014). Examples of the standards and protocols included in the plan are for operations during inclement weather and low visibility, measures to prevent loss of propulsion, and requirements for tug escorts.

Tug escort refers to the stationing of tugs in proximity to a vessel as it transits into port to provide immediate assistance should a steering or propulsion failure occur. In accordance with the Puget Sound Harbor Safety Plan, an escort is required for tank vessels that have a single hull and are over 5,000 gross register tonnage, and for all oil tankers 40,000 deadweight

tonnages and over. Tug assist refers to the positioning of tugs alongside a vessel and applying force to assist in making turns, reducing speed, providing propulsion, and docking. As necessary, tug escort and tug assist are provided to vessels that call at PoPA.

3.8.1.3 Pilotage

Use of a port pilot is required for transit in and out of Puget Sound waters by all vessels of foreign registry and for U.S. vessels that do not have a federally licensed pilot on board (RCW 88.16.070). Puget Sound Pilots are responsible for the pilotage of vessels in and out of Puget Sound waters, including the waters of Port Angeles Harbor. Puget Sound Pilots have a facility on the Ediz Hook peninsula, which consists of a jetty with an office and mooring for two pilot boats. The facility is just west of the entrance gate to USCG AIRSTA/SFO Port Angeles. The pilots operate 24 hours a day, 7 days a week; thus, their vessels are often moving in and out of the harbor.

3.8.2 Affected Environment

The Strait of Juan de Fuca is a channel that extends east from the Pacific Ocean between Vancouver Island, British Columbia, and the Olympic Peninsula, Washington, to Haro Strait, San Juan Channel, Rosario Strait, and Puget Sound. The northern coast of the Olympic Peninsula forms the southern boundary of the strait. Ediz Hook creates a large, natural deep-water harbor shielded from the storms and swells that move predominantly eastward down the Strait from the Pacific Ocean, and Port Angeles Harbor is used by vessels travelling between the Strait of Juan de Fuca, Puget Sound, and the Port of Port Angeles. Numerous types of vessels use the harbor, including tankers, dry bulk cargo carriers, barges, tugs, fishing boats, leisure craft, Puget Sound Pilots craft, and USCG AIRSTA/SFO and Navy vessels.

3.8.2.1 Vessel Traffic

The PoPA attracts numerous large ships to the harbor. PoPA owns and operates three deep water berths (Terminals 1, 3, and 7 [T1, T3 and T7]; Terminal 7 is not currently operational) that can accommodate vessels up to 1,200 feet long with drafts of up to 35 feet. Nippon Paper Industries USA has a berth at its facility, on the western end of the Ediz Hook peninsula. There are also five vessel anchorages in Port Angeles Harbor that are operated by PoPA and Vessel Traffic Service Puget Sound (VTSPS, which manages marine vessel traffic) for use by vessels awaiting pilotage or bunkering, or for vessels in distress.

In 2013, a total of 254 cargo vessels, tankers, and barges used T1 and T3 at the port. This included 45 vessels requiring topside repair (of which 23 were tankers), and 19 bulk cargo vessels and ocean barges for transporting forest products (Waknitz 2014).

A year-round vehicle/passenger ferry service operates between Port Angeles and Victoria, BC. In the months of May through September when travel demand is the greatest, the ferry makes eight crossings per day. At other times of the year, the ferry makes four crossings per day (The Ferry Traveller [sic] Website 2014).

There is an aquaculture operation (Icicle Seafoods) in Port Angeles Harbor approximately 1,000 feet from the existing T-Pier (Figure 1-3). The aquaculture operation consists of commercial fish pens for raising salmon and associated structures and equipment. The operation is supported by a shore-side facility on the Ediz Hook peninsula, located to the west of USCG AIRSTA/SFO Port Angeles. Small motor boats operate between the shore-side facility and the commercial fish pens to transport staff, small equipment, and fuel. Feed is delivered to the shore-side facility, loaded onto a feed barge, transported to the fish pens, and off-loaded. This occurs once

or twice per week depending on the feed schedule for the fish. Larger vessels are used to transport market-ready fish from the fish pens to the shore-side facility.

3.8.3 Environmental Consequences

Marine vessel traffic impacts are evaluated to determine whether marine-based construction equipment (i.e., pile driving barge, supply barge, and small craft for observation) and construction of the pier structure would interfere with normal navigation. Impacts would be significant if the increase in marine vessel volumes would warrant construction of new navigational aids or facilities, or the new TPS pier would preclude access to existing facilities.

3.8.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

Vessel traffic In Port Angeles Harbor would increase during construction as tugs and barges would bring construction materials and equipment such as the pile driving rig to the site. The number of trips would be relatively small (several per week), with no adverse effects on marine traffic. Construction of the TPS pier would preclude marine traffic moving through the construction zone, and construction signage and floating barriers would be used to keep other vessels out of the construction zone. Access would still be available to the Icicle Seafoods fish pens during construction. Other than the small boats used by the fish pens, no other vessels (e.g., cargo ships, ferries, or tugs) operate in close proximity to the site. There would be no effects on marine traffic during construction.

Operation/Long-term Impacts

Under Alternative 1, a portion of the Icicle Seafoods fish pens would be located inside the NVPZ for the moored BVs. Icicle Seafood vessels would normally be permitted to transit within the NVPZ in accordance with 33 CFR 165; therefore, an NVPZ would not substantially alter their operations. Due to its distance from the site, the Puget Sound Pilots Station would not be affected by this alternative. Similarly the proposed TPS pier would not impact bulk cargo vessels, tankers, barges, ferries, or other commercial vessels, which do not use this area of the harbor to moor or transit.

The regulatory and vessel navigation and safety procedures for marine transportation within Port Angeles Harbor (such as the requirement for tug escort/assist of tankers, pilotage for vessels of foreign registry, and for U.S. vessels that do not have a federally licensed pilot on board, and adherence to the guidelines in the Puget Sound Harbor Safety Plan) would ensure that there is minimal potential for Alternative 1 to impact marine traffic.

Conclusion

Alternative 1 would have no significant adverse impacts on marine traffic.

3.8.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Construction impacts on marine traffic would be similar to those under Alternative 1.

Operation/Long-term Impacts

Under Alternative 2, both the Icicle Seafoods fish pens and the Puget Sound Pilots Station would be located inside the NVPZ for the moored BVs. Icicle Seafoods and the Puget Sound Pilots would normally be permitted to transit within the NVPZ in accordance with 33 CFR 165;

Therefore, an NVPZ would not substantially alter Icicle Seafoods or the Puget Sound Pilots operations under Alternative 2.

Conclusion

Alternative 2 would have no significant adverse impacts on marine traffic.

3.8.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Construction impacts on marine traffic would be similar to those under Alternative 1.

Operation/Long-term Impacts

Under Alternative 3, Icicle Seafoods' fish pens and the Puget Sound Pilots Station would not be located inside the NVPZ for the moored BVs, and their boats would not need to access or operate within the NVPZ or restricted area. Under Alternative 3, an NVPZ would have no impact on Icicle Seafoods or the Puget Sound Pilots Station operations.

Conclusion

Alternative 3 would have no adverse impacts on marine traffic.

3.8.3.4 No Action Alternative

Under the No Action Alternative, there would be no changes to marine traffic and thus no adverse impacts.

3.9 Shore Traffic and Circulation

This section describes surface transportation in the vicinity of the project area and evaluates the potential impacts of the Proposed Action on vehicle traffic on adjacent and connected roadways, transit, bicycles, pedestrians, and parking. Marine traffic is addressed in Section 3.8, *Marine Traffic and Transportation*.

3.9.1 Regulatory Setting

Laws, rules, standards, and plans applicable to the Proposed Action include WAC 296-155, which provides safety standards for construction work and rules for signaling and flaggers; the City of Port Angeles Comprehensive Plan Transportation Element (City of Port Angeles 2010); and the City of Port Angeles HRMP (City of Port Angeles 2011a). The city is currently developing a Transportation Plan as part of its multi-phased Waterfront and Transportation Improvement Plan (City of Port Angeles 2015a).

The Transportation Element of the Comprehensive Plan defines how vehicular traffic and non-motorized means of travel are to be routed from one portion of the community to another in the most efficient, economical, and compatible manner. The HRMP provides a future vision for the city's harbor area, including Ediz Hook. Most of the goals, policies, and objectives in the Comprehensive Plan Transportation Element and in the HRMP pertain to the development of new transportation facilities or improvements to existing transportation facilities and are not specifically applicable to the Proposed Action, which does not involve new roads or alterations to existing roads. However, these planning documents provide information about the existing condition of transportation facilities in the vicinity of the project area that are useful in evaluating potential impacts, and future plans useful for evaluating the potential cumulative effects of the Proposed Action.

3.9.2 Affected Environment

The project area is located at USCG AIRSTA/SFO Port Angeles at the east end of Ediz Hook. Ediz Hook Road is an undivided two-lane local street that runs the length of Ediz Hook, bisecting and providing access to industrial and commercial facilities, public parks and recreation areas, a public boat launch, and USCG AIRSTA/SFO Port Angeles on the narrow spit. The only surface access to Ediz Hook is via Marine Drive, a two-lane principal arterial that runs along the south side of Port Angeles Harbor, providing access to the city's industrial/commercial waterfront. The closest intersection to the project area is at Marine Drive and West Hill Street, a three-way intersection with stop protection on northbound West Hill Street. Regional access to downtown Port Angeles is via US 101 from the east and west. Marine Drive can be accessed from US 101 via the Tumwater Truck Route (State Route 117), in addition to multiple other routes involving arterials and local streets, including West Hill Street.

All roads in Port Angeles, including Highways of Statewide (US 101) and Regional Significance (US 101 and Tumwater Truck Route), operate at level of service (LOS) D or better (City of Port Angeles 2010).

There are no public transit services along Ediz Hook Road. The closest public transit to the project area is Clallam Transit Route 26 (Westside), which travels along Marine Drive as far west as West Hill Street (roughly 2.4 miles from the USCG AIRSTA/SFO Port Angeles entrance gate) where it then heads up West Hill Street to the downtown area. Parking areas are present on both sides of Ediz Hook Road at the Sail and Paddle Park, the former A-frame site, Harborview Park, the Ediz Hook Boat Launch, and at commercial facilities (Puget Sound Pilots

Station, Icicle Seafoods). The Ediz Hook Boat Launch, located about 180 feet west of the USCG AIRSTA/SFO Port Angeles entrance gate, is a five-lane public boat launch with two loading floats and parking for about 50 vehicles with trailers. Approximately 4,000 boats are launched annually at the boat launch (City of Port Angeles 2011b). Usage records from 2013 and 2014 indicate that the boat launch is most active in May, with over 100 boats launched per day (WDFW 2014a).

The Port Angeles Waterfront Trail is a 6.5-mile bicycle and pedestrian path that extends from USCG AIRSTA/SFO Port Angeles along the shoreline to the Rayonier Mill Site across the harbor, where it connects to the Olympic Discovery Trail. The trail provides nearly continuous access to the waterfront, except through industrial areas at the base of Ediz Hook and along the Port Angeles waterfront where it follows Marine Drive away from the shoreline. The Waterfront Trail follows Ediz Hook Road along the right shoulder from the industrial area to USCG AIRSTA/SFO Port Angeles. The trail is intermittent on the paved road along sections of Marine Drive with no buffer, and sections of the trail through the Nippon Paper Industries operations at the base of Ediz Hook are poorly marked and lack space for two-way travel. On Ediz Hook, poor signage and undefined parking areas at the Sail and Paddle Park, Harborview Park, and the public boat launch create parking conflicts with the trail. The City of Port Angeles plans to improve both parking and the Waterfront Trail on Ediz Hook, including: organizing and focusing parking areas at public parks and the public boat launch, rerouting the trail through the industrial area at the base of Ediz Hook to reduce crossings, installing highly visible markings and signage for the trail from the industrial area to USCG AIRSTA/SFO Port Angeles, and providing bicycle racks at parks and the public boat launch. Planned improvements along Marine Drive include relocation or realignment of the trail, restriping, marking bicycle routes with highly visible paint, and installing sharrows on Marine Drive (City of Port Angeles 2011a). (Sharrows are street markings, typically a wide arrow combined with a bike symbol, placed in the center of a travel lane to indicate that bicyclists may use the full lane.)

3.9.3 Environmental Consequences

The evaluation of impacts on shore traffic and circulation considers the potential impacts that construction and operation of the Proposed Action could have on vehicular traffic on adjacent and connected roadways, transit, bicycles, pedestrians, and parking. Impacts on shore traffic and circulation would be considered significant if the Proposed Action were to:

- Conflict with applicable LOS standards or travel demand measures for designated roadways.
- Substantially interfere with ingress and egress to adjacent land uses.
- Substantially change traffic circulation patterns, creating a safety hazard or interfering with emergency access.
- Conflict with adopted policies and plans for bicycle and pedestrian facilities, or decrease the performance or safety of these facilities.
- Result in inadequate parking capacity.

3.9.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

Construction access to the Alternative 1 site at USCG AIRSTA/SFO Port Angeles would be via Marine Drive and Ediz Hook Road. Construction traffic on these roadways would include worker personal vehicles and construction vehicles and equipment, including large trucks. Large trucks would use established truck routes to access Marine Drive from US 101, while construction workers traveling to and from the site in personal vehicles would likely use a variety of routes to access Marine Drive. All construction activities, including parking and staging, would be located inside USCG AIRSTA/SFO Port Angeles. Construction of Alternative 1 would not require any off-base road closures or detours. Additional construction equipment and materials would be transported to the Alternative 1 site via barge. Construction impacts on marine traffic and transportation are addressed in Section 3.8.

Construction traffic would not alter existing traffic circulation patterns, substantially interfere with ingress and egress to existing land uses, or substantially affect the movement of goods and materials at industrial and commercial facilities at the base of Ediz Hook. Construction traffic would not disrupt access to or use of bicycle and pedestrian facilities, and would not utilize any off-base parking. Potential impacts during construction are primarily related to congestion through the industrial area at the base of Ediz Hook and at the Ediz Hook Boat Launch approximately 180 feet west of the entrance gate to USCG AIRSTA/SFO Port Angeles.

Throughout most of construction, increased traffic volumes would be concentrated in the morning and evening, when workers are traveling to and from the Alternative 1 site. Construction workers would travel along Marine Drive and Ediz Hook Road around the same time the workers at Ediz Hook industrial and commercial facilities are accessing the area. This may result in minor daily congestion through the industrial area at the base of Ediz Hook. In the morning, construction traffic could create minor delays at the entrance gate long enough to cause backups on Ediz Hook Road in the vicinity of the Ediz Hook Boat Launch. Because the easternmost boat ramp is only 180 feet west of the entrance gate, a backup of nine construction vehicles (assuming an average 20-foot length per vehicle) could cause temporary congestion at the boat launch. Delays at the entrance gate are expected to be short, but could occur daily. To avoid congestion at the boat launch, construction vehicles would not stop within a 100-yard zone on the west side of the boat launch as they wait to clear the entrance gate. Construction vehicles awaiting entrance to USCG AIRSTA/SFO Port Angeles would wait on the shoulder of the road to allow users unrestricted access to the boat launch. The construction contractor would coordinate with the City of Port Angeles to prepare a traffic control plan to minimize delays of traffic traveling to or accessing the boat launch.

During initial project staging and other short periods of time when construction materials are transported to the Alternative 1 site, construction traffic would be slightly higher in volume, would include more large trucks, and could be spread throughout the workday. This could result in a slightly higher level of congestion through the Ediz Hook industrial area and at the boat launch for a period of one to several days at a time.

Overall, construction impacts would be limited to potential minor daily congestion on Ediz Hook Road through the industrial area at the start and end of each workday, and at the boat launch in the morning if backups occur at the USCG AIRSTA/SFO Port Angeles entrance gate; and for additional short periods of time (one to several days) in these areas during initial and phased

staging of materials. Construction activities under Alternative 1 would not have a significant impact on shore traffic and circulation.

Operation/Long-term Impacts

Alternative 1 does not include the construction of new roadways or new access to existing land uses, and would not alter existing roadways or access either on or off USCG AIRSTA/SFO Port Angeles. Access to USCG AIRSTA/SFO Port Angeles would remain the same. When the TPS vessels are not in port, no additional personnel would be present at USCG AIRSTA/SFO Port Angeles, and there would be no additional traffic on Ediz Hook Road, Marine Drive, or other roadways. When the TPS vessels are in port, up to 20 to 30 additional personnel could be present for short periods of time. Personnel temporarily based at USCG AIRSTA/SFO Port Angeles would not have personal vehicles; however, up to eight government vehicles would be available for their use. To travel off base, they would enter and leave the base through the west entrance gate and would use Ediz Hook Road and Marine Drive to access the Port Angeles waterfront and downtown areas. Alternative 1 would have no effect on existing vehicular, bicycle, or pedestrian traffic patterns on Ediz Hook, Marine Drive, or connected roadways or trails (e.g., the Waterfront Trail).

Alternative 1 would potentially result in small periodic increases in daily traffic on Ediz Hook Road from TPS crew driving individual vehicles. This increase would be barely detectable and is not expected to create new congestion at the entrance to USCG AIRSTA/SFO Port Angeles or access points to other land uses on Ediz Hook (e.g., the public boat launch, Puget Sound Pilots Station, Icicle Seafoods, parks/public viewpoints, Nippon Paper Industries, etc.), or affect traffic flow.

The project would not add or alter parking off USCG AIRSTA/SFO Port Angeles. Existing on-site parking spaces eliminated for the CPO mess would be replaced with new parking for both the new AFF and CPO mess to accommodate existing needs and 20 to 30 vessel crew and visitors to the project facilities. There would be no net loss of on-site parking. Operation and maintenance activities under Alternative 1 would not have a significant impact on shore traffic and circulation.

Conclusion

Implementation of Alternative 1 (both construction and operation) would not have a significant impact on shore traffic and circulation.

3.9.3.2 Alternative 2: Western Site

For shore traffic and circulation, short-term construction impacts and long-term operational impacts would be the same as for Alternative 1. The construction window for Alternative 2 (12 months) would be less than that for Alternative 1 (18 months) and Alternative 3 (14 months). Operation and maintenance activities under Alternative 2 would not have a significant impact on shore traffic and circulation.

3.9.3.3 Alternative 3: Eastern Site

For shore traffic and circulation, short-term construction impacts and long-term operational impacts would be the same as for Alternative 1. The construction window for Alternative 3 (14 months) would be less than that for Alternative 1 (18 months) and slightly more than Alternative 2 (12 months). Operation and maintenance activities under Alternative 3 would not have a significant impact on shore traffic and circulation.

3.9.3.4 No Action Alternative

Under the No Action Alternative, the project would not be constructed and there would be no impacts on shore traffic and circulation in the project area.

3.10 Visual Resources

Visual resources are the natural and man-made features that contribute to the overall visual character of a particular landscape. Visual resources are analyzed in this EA in terms of views from close-in and from a distance, and of the foreground, middle ground, and background. All areas with line-of-sight to the project area are commonly referred to as the "viewshed."

3.10.1 Regulatory Setting

There are no specific laws or regulations for visual resources. However, visual resources are commonly evaluated for their compatibility with existing or proposed land use plans and existing or proposed land uses, in addition to the consideration of cultural resources.

The City of Port Angeles Comprehensive Plan (City of Port Angeles 2010) includes the following goal and policy pertaining to visual resources on Ediz Hook:

> *Goal H. To provide opportunities for industrial development in a manner, which efficiently uses the community's various attributes and natural resources, has minimal impact on the environment, contributes to the City's quality of life, and is compatible with the desired urban design of the City.*
>
> > *Policy 3. Industrial areas should buffer their impact to mitigate nuisance and hazardous characteristics such as noise, particulate matter in the air, water or odor pollution, or objectionable visual material.*

The City of Port Angeles HRMP (City of Port Angeles 2011a) includes the following goal pertaining to visual resources on Ediz Hook and its nearshore and offshore marine waters:

> *The High-Intensity Marine Environment - On the outer Ediz Hook (except for the USCG area), structures may not be constructed between the water and the road except for one rest stop, view point, picnic area deck, or public access amenity up to 200 square feet every 1,200 linear feet. On the inner Ediz Hook, structures and pavements for water-oriented uses may be developed at least 15 feet from the water. Visual access to the shoreline shall typically not be blocked and repair of shoreline stabilization measures is permitted. A pedestrian and bicycle trail is required with any roadway improvements. Outside of Ediz Hook, water-related and water-enjoyment uses may be developed within the VCA* [i.e., Vegetation Conservation Area] *and setback if part of a boating facility.*

The federal government is not subject to local or state land use or zoning regulations under the doctrine of federal supremacy, unless specifically consented to by Congress. However, the federal government takes state and local land use plans, guidelines, and ordinances into consideration and cooperates with agencies to avoid conflicts when possible. The Navy and USCG incorporate sustainable planning practices into facility planning, construction, and operations, as required under various environmental laws and executive orders (e.g., Naval Facilities Instruction 11010.45 [Navy 2003]). These practices address general principles and guidance for sustaining compatible conditions through coordination with neighboring communities. While USCG AIRSTA/SFO Port Angeles is exempt from local planning, the USCG works closely with the City of Port Angeles to accommodate city planning goals.

3.10.2 Affected Environment

USCG AIRSTA/SFO Port Angeles occupies the eastern end of Ediz Hook (Figures 1-2 and 1-3). Ediz Hook is a 3.5-mile long natural spit that juts into the Strait of Juan de Fuca and forms Port

Angeles Harbor. The spit ranges from 90 to 750 feet wide and is characterized by flat topography.

Ediz Hook is one of the Port Angeles' notable visual elements, along with the Strait of Juan de Fuca, Vancouver Island, and the San Juan Islands to the north, and Hurricane Ridge and the Olympic National Forest to the south. Ediz Hook has "superlative" views of the ocean, mountains, waterfront, and City of Port Angeles (City of Port Angeles 2010). West of USCG AIRSTA/SFO Port Angeles, Ediz Hook Road and public parking areas occupy the top of the spit. Large facilities associated with Nippon Paper Industries occupy the west end of Ediz Hook, while public beaches, the Ediz Hook boat launch, and the Puget Sound Pilots Station occupy the central portion. The northern shoreline is predominantly undeveloped and views are mostly of natural beaches. The southern shoreline includes the Puget Sound Pilots Station dock, the Ediz Hook boat launch, and natural beaches. Views of Port Angeles Harbor include floating fish pens, and numerous commercial and private vessels of various sizes.

Although physical access to USCG AIRSTA/SFO Port Angeles is restricted from the general public, the public has visual access to a large area of the waterfront from a distance. The primary public viewpoints of USCG AIRSTA/SFO Port Angeles available to the general public are from boats in Port Angeles Harbor, the central portion of Ediz Hook with its public parks and access points, and from the Port Angeles waterfront. The view of USCG AIRSTA/SFO Port Angeles from these viewpoints consists of open water, the T-Pier, breakwater, and floating security barrier; riprap-modified shoreline and some areas of naturally vegetated upper beach (primarily at the east end); and the USCG buildings, airstrip, helipad, and associated facilities on top of the spit. Views from open water around USCG AIRSTA/SFO Port Angeles include commercial vessels and private boaters passing through the area, and the floating fish pens off the south shore in the harbor. Off-site views of USCG AIRSTA/SFO Port Angeles from both land and water are largely unobscured by vegetation or terrain. Most surrounding areas have a direct line-of-sight to the entire base.

3.10.3 Environmental Consequences

The evaluation of impacts on visual resources considers the degree of visible change that the Proposed Action may have, taking into account the value and sensitivity of the visual environment. Impacts on visual resources would be significant if the Proposed Action would:

- Result in permanent or long-term visual changes to the existing environment that are incompatible with the overall character of the surrounding areas or existing and designated land uses.
- Result in permanent or long-term changes to an area that is a valued visual resource and affect a large number of viewers.

3.10.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

Construction activities would cause visual disturbance to the landscape due to the changing nature of the views as construction proceeds. Visual clutter would be caused by heavy construction equipment including barges, cranes, and backhoes; from materials stockpiled around the construction site; and from the floating safety barrier that would be deployed during construction to fence off the construction site.

Under Alternative 1, construction would occur approximately 2,150 feet east of land-based public viewpoints on Ediz Hook located west of the USCG AIRSTA/SFO Port Angeles entrance gate. Construction activities would have no effect on views to the north, south, or west from this public viewpoint. Activities at intervening facilities, such as the Ediz Hook Boat Launch and the Puget Sound Pilots Station, would likely dominate close-in views from this location facing east, so while land- and water-based construction activities would be visible, the degree of visual disturbance to the landscape would be relatively small. The closest land-based views of the construction site from the south are from the Port Angeles waterfront, approximately 1.3 miles across Port Angeles Harbor. The construction site and visual disturbance to the Ediz Hook landscape and nearshore area would be barely detectable from the Port Angeles waterfront. Construction activities would be highly visible from the water-based viewpoints in Port Angeles Harbor; however, the proposed floating safety barrier would separate viewers from the construction site and reduce the visual scale of construction equipment. Overall, visual changes to the landscape during construction would be small and localized, primarily affecting views of the Ediz Hook shoreline and nearshore from water-based viewpoints within Port Angeles Harbor. Construction activities would be temporary, and impacts on visual resources would also be temporary, lasting only for the duration of construction. Alternative 1 would not have a significant impact on visual resources during construction.

Operation/Long-term Impacts

Under Alternative 1, the proposed TPS pier, TPS vessels when they are in port, and upland facilities would be located approximately 2,150 feet east of land-based public viewpoints on Ediz Hook and would have no effect on views to the north, south, or west. Views to the east of the Ediz Hook shoreline and nearshore are currently dominated by the Ediz Hook boat launch and the Puget Sound Pilots Station in the foreground, and the existing T-Pier and upland facilities at USCG AIRSTA/SFO Port Angeles in the middle ground. The proposed facilities and operations would be added to middle ground views. Overall, the degree of visual disturbance to the landscape from land-based public viewpoints on Ediz Hook would be relatively small. Visual changes to the Ediz Hook shoreline and nearshore from the Port Angeles waterfront would be barely detectable. The proposed facilities and operations would visibly increase the visual clutter along the south shore of Ediz Hook from nearby public viewpoints on the water. Although the TPS vessels would be larger than vessels using the existing T-Pier, the proposed facilities and operations would be similar in nature to existing facilities and operations at USCG AIRSTA/SFO Port Angeles, so changes in the overall view from the water would be small. The proposed facilities and operations would not obscure distant views or visibly alter the existing character of the viewshed. The overall visual character of the proposed pier and support facilities would be consistent with the existing visual character on the inner east end of Ediz Hook, and would be compatible with visual resource goals in the High-Intensity Marine Environment.

Conclusion

Implementation of Alternative 1 would not have a significant impact on visual resources from the proposed pier and support facilities.

3.10.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Under Alternative 2, construction would occur just east of the USCG AIRSTA/SFO Port Angeles entrance gate. Activities and facilities at the Ediz Hook Boat Launch and the Puget Sound Pilots

Station would likely still intervene with views of the construction site from land-based public viewpoints on Ediz Hook just west of the entrance gate; however, construction activities would be closer and the degree of visual disturbance to the landscape would be greater than under Alternative 1. Views of the construction site and visual disturbance to the Ediz Hook landscape and nearshore area from distant land-based views and from the water would be similar to Alternative 1. Alternative 2 would not have a significant impact on visual resources during construction.

Operation/Long-term Impacts

Land-based close-in views from the west and close-in water-based views from the south in Port Angeles Harbor would change from the current view of the existing entrance gate and guard station, airstrip, rock riprap jetty, and modified beaches, to include the proposed pier and on-land support facilities, and the TPS vessels when they are in port. The proposed pier would be similar in nature to existing piers at the Puget Sound Pilots Station and public boat launch, but the TPS vessels would be larger. Overall, the proposed pier, facilities, and TPS vessels would increase the visual clutter along the south shore of Ediz Hook from nearby viewpoints on land and water, but from a distance the overall character of the shoreline would not change substantially. The proposed facilities and operations would not obscure distant views or substantially alter the existing character of the viewshed. The overall visual character of the proposed pier and support facilities would be consistent with the existing visual character on the inner east end of Ediz Hook and would be compatible with visual resource goals in the High-Intensity Marine Environment.

Conclusion

Implementation of Alternative 2 would not have a significant impact on visual resources from the proposed pier and support facilities.

3.10.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Under Alternative 3, construction would occur more than 5,200 feet east of land-based public viewpoints on Ediz Hook. Construction would be largely obscured by existing facilities on USCG AIRSTA/SFO Port Angeles and the curve of the shoreline, and would have no effect on views to the north, south, west, or east. Views of the construction site and visual disturbance to the Ediz Hook landscape and nearshore area from distant land-based views and from the water would be the similar to those under Alternative 1. Alternative 3 would not have a significant impact on visual resources during construction.

Operation/Long-term Impacts

Under Alternative 3, the proposed TPS pier and upland facilities would be more than 5,200 feet east of land-based public viewpoints on Ediz Hook and would be largely obscured by existing facilities on USCG AIRSTA/SFO Port Angeles and the curve of the shoreline. In general, close-in views of Alternative 3 from the water would be similar to those under Alternative 1. Because the proposed pier and on-land facilities would be located closer to the existing T-Pier and on-land facilities at the eastern end of Ediz Hook, close-in views of the shoreline from the water would be of denser waterfront development over a shorter length of shoreline than under Alternative 1. From a distance, the overall character of the shoreline would not change substantially, and the proposed facilities and operation would not obscure distance views or

substantially alter the character of the viewshed. The overall visual character of the proposed pier and support facilities would be consistent with the existing visual character on the inner east end of Ediz Hook and would be compatible with visual resource goals in the High-Intensity Marine Environment.

Conclusion

Implementation of Alternative 3 would not have a significant impact on visual resources from the proposed pier and support facilities.

3.10.3.4 No Action Alternative

Under the No Action Alternative, the proposed TPS pier and support facilities would not be constructed. There would be no change to visual resources and no impact on visual resources.

3.11 Solid Waste and Hazardous Materials

This section provides an overview of the regulatory framework for solid waste and hazardous materials management in Washington State, describes existing waste generation and management practices at USCG AIRSTA/SFO Port Angeles, and assesses the potential impact of the Proposed Action on the generation and management of solid waste and hazardous materials.

Solid waste is defined by the EPA as any garbage or refuse; sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility; and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. Solid wastes include both hazardous and nonhazardous waste. A waste is considered hazardous if it exhibits hazardous properties (i.e., is ignitable, corrosive, reactive, or if it contains certain amounts of toxic chemicals) or if it is included on a specific list of wastes that the EPA has determined are hazardous.

3.11.1 Regulatory Setting

The Resource Conservation and Recovery Act (RCRA) of 1976, which amended the Solid Waste Disposal Act, regulates solid waste and hazardous materials management activities and the management of underground storage tanks holding petroleum products and other chemicals. The objectives of RCRA are to protect human health and the environment from the potential hazards of waste disposal, to conserve energy and natural resources, to reduce the amount of waste generated, and to ensure that wastes are managed in an environmentally sound manner. Although RCRA is a federal statute, many states implement the RCRA program on behalf of the EPA. In Washington, Ecology is authorized by the EPA to implement most of the RCRA program based on state regulations that are consistent with, and at least as stringent as, the federal requirements.

The Hazardous Waste Management Act of 1976 (Chapter 70.105 RCW), as amended, gives Ecology the authority to regulate dangerous waste and extremely hazardous waste in the state. The purpose of the Hazardous Waste Management Act is to establish a comprehensive statewide framework for the planning, regulation, control, and management of hazardous waste. The Hazardous Waste Reduction Act of 1990 (Chapter 70.95C RCW) establishes state policies and goals that encourage the reduction of hazardous substance use and hazardous waste generation.

The Hazardous Waste Management Act and the Hazardous Waste Reduction Act require Ecology to develop and regularly update statewide hazardous waste and solid waste plans. The 2009 Beyond Waste Plan is a 30-year plan for managing both hazardous and solid waste (Ecology 2009). It provides statewide guidance for reducing the use of toxic substances, decreasing waste generation, increasing recycling, and properly managing any wastes that remain. Update of the 2009 Beyond Waste Plan commenced in 2014. Both EPA and Ecology maintain databases that track sites with potential and confirmed releases of chemicals to the environment, and facilities that manage hazardous materials as part of their operations.

The Hazardous Waste Reduction Act also requires facilities to prepare hazardous waste plans. Under the Act, facilities that generate 2,640 lbs or more of hazardous waste per year, or facilities that are required to report under the federal law called the Emergency Planning and Community Right-to-Know Act (Section 313 EPCRA), must prepare a Pollution Prevention Plan and are referred to as Hazardous Waste Planners. The focus of such plans is the identification

and evaluation of all reasonable opportunities for the reduction in the use of hazardous substances and the reduction, recycling, and treatment of hazardous substances.

3.11.2 Affected Environment

3.11.2.1 Solid Waste

USCG AIRSTA/SFO Port Angeles currently generates solid waste such as cardboard, paper, plastic, glass, metals, food waste, and green waste from the maintenance of landscaped areas. Solid waste disposal services are provided by Olympic Disposal, which has a yearly contract with the USCG.

The USCG has a Unit Qualified Recycling Program per USCG policy COMDTINST 16477.5. A manager is responsible for overseeing the recycling program on the installation, and recyclable materials are accumulated for sale to commercial recycling businesses. Proceeds are remitted to the Unit's Morale, Welfare, and Recreation account after operating expenses are paid.

3.11.2.2 Hazardous Materials

USCG AIRSTA/SFO Port Angeles is listed on Ecology's database of facilities or sites of environmental interest. Ecology lists the base as a Class 4 Facility; this classification applies to marinas and other small fueling facilities that transfer oil to non-recreation vessels that have a fuel capacity of less than 10,500 gallons. Ecology identifies the base as a Hazardous Waste Planner.

The USCG prepared a Hazardous Waste Minimization Plan (USCG 2013) for the base in accordance with the Hazardous Waste Reduction Act (CGARISTASFOPAINST 5090.1A) and Ecology requirements for a Pollution Prevention Plan. The USCG plan states that the base is committed to decreasing the amount of materials purchased, stored, and discarded as waste by substituting hazardous materials for non-hazardous materials where possible. Where a hazardous material is required for continued operations, the plan states that all efforts will be made to recycle the hazardous waste. In addition, there is a host/tenant hazardous waste agreement for handling and managing hazardous waste for any tenant commands that work from the base, which would include the TPS crews.

USCG AIRSTA/SFO Port Angeles uses and stores small quantities of hazardous materials that are essential for mission preparedness. The types of hazardous materials currently used at the base include diesel fuel, jet fuel, gasoline, epoxy primer, stripper, hardener, molding compound, sealant, coolant, paint, and paint thinner. As stipulated in the Hazardous Waste Minimization Plan, all hazardous materials used at USCG AIRSTA/SFO Port Angeles are stored in a centralized hazardous materials storage locker that meets regulatory standards and requirements. In 2013, 873 lbs of hazardous waste was generated at USCG AIRSTA/SFO Port Angeles, compared to 1,047 lbs in 2011.

On September 17, 2014, a Hazardous Building Materials Survey was conducted at the Alternative 2 site, focusing on the existing timber bulkhead at the end of the jetty, which includes treated wood. Three samples were collected from the sealant on the wood piling and timbers. Analysis of the samples determined that the sealant contains 3 percent chrysotile asbestos. Lead paint was not identified during the survey (Med-Tox Northwest 2014a, b). Hazardous building material surveys have not been conducted at the Alternative 1 or 3 sites, since there are no existing facilities at these sites that would be affected.

The nearby aquaculture operation (Icicle Seafoods) is the only EPA-regulated site located within a 1-mile radius of the project area (EPA 2014). Icicle Seafoods has a wastewater discharge

permit from Ecology. No EPA-regulated waste discharge sites are associated with USCG AIRSTA/SFO Port Angeles (USCG 2008).

3.11.3 Environmental Consequences

The impacts from the Proposed Action on solid waste and hazardous materials would be considered significant if the increased demand for disposal would exceed the capacity of the collection/ disposal service to accommodate the waste.

3.11.3.1 Alternative 1: Midwestern Site (Preferred Alternative)

Construction/Short-term Impacts

Construction of the upland facilities would require the demolition and removal of pavement next to the CPO mess, site excavation for installing the underground sewage storage tank and utilities, minimal site grading, and removal and relocation of signage. These activities would generate construction wastes such as asphalt, concrete, metal, wood, and excess excavated soil. Similarly, in-water construction would generate various solid wastes including concrete and scrap wood. A variety of hazardous materials would be used in construction and activities such as painting the upland facilities, and the use and maintenance of construction equipment are expected to produce small quantities of hazardous waste including spent solvents, waste paint and paint thinner, used lubricating oil, and engine oil. The Navy would prepare and implement an Environmental Protection Plan (EPP), which would include measures to be implemented by the contractor to ensure that hazardous materials are handled and stored in accordance with federal and state regulations. There is some potential for spills during overwater work; however, BMPs identified in the EPP would be in place to prevent or minimize spills, and a Spill Prevention Plan would be implemented during construction, with materials on hand to prevent the spread of spill, as well as clean up a spill. All construction waste, including hazardous waste, would be handled, stored, and disposed of by the construction contractor in accordance with applicable construction waste and hazardous waste guidance, laws, and regulations. All hazardous waste generated during construction would be disposed of at a facility licensed to receive the waste in accordance with Washington State Dangerous Waste Regulations (WAC-173-303).

Operation/Long-term Impacts

Operation of the TPS pier and upland facilities would generate solid waste such as cardboard, paper, plastic, glass, metals, food waste, and green waste, as well as small quantities of hazardous wastes such as diesel fuel, coolant, hydraulic fluid, oil, paint and paint thinner, and solvents. The type of waste that would be generated by operation under Alternative 1 would be the same as that currently generated at other facilities at USCG AIRSTA/SFO Port Angeles. However, the quantity of waste generated at the base as a whole would increase as a result of Alternative 1.

The new AFF would be designed to LEED Silver standards. To achieve this standard, measures would be implemented at the AFF to manage construction waste, use sustainable building materials and recycle excess building materials, and store and collect recyclables during operation. These activities would reduce the amount of waste generated during construction and operation.

Conclusion

Alternative 1 would result in the increased generation of solid waste. However, base policies and practices minimize the generation of waste that must be disposed of and maximize the use of material that can be recycled.

AIRSTA/SFO Port Angeles personnel are trained in the handling and storage of hazardous materials, and in operations that use hazardous materials such as fueling vessels. In addition, the base is equipped with facilities to store hazardous materials safely. Under this alternative, the DFM tank and fueling system would be constructed to federal and state standards and operated according to established base protocols found in the Hazardous Waste Minimization/Pollution Prevention Plan.

Overall, Alternative 1 would increase the use of hazardous materials and generation of solid waste, but would not adversely affect the ability of the base to dispose of or use these materials in a safe and environmentally acceptable manner. There would be no significant impact on solid waste and hazardous materials from the construction or implementation of Alternative 1.

3.11.3.2 Alternative 2: Western Site

Construction/Short-term Impacts

Construction impacts would be similar to those under Alternative 1, except there would be some additional demolition of the bulkhead at the end of the existing riprap jetty that would generate asbestos and wood piles that would require disposal. Prior to demolition, the sealant on the wood piling and timbers of the bulkhead that contain asbestos would be removed by a certified asbestos abatement contractor. All construction waste, including solid and hazardous waste, would be disposed of by the construction contractor in accordance with applicable construction waste and hazardous waste laws and regulations.

Operation/Long-term Impacts

The generation of solid waste and use of hazardous materials would be similar to Alternative 1.

Conclusion

Alternative 2 would increase the use of hazardous materials and generation of solid waste. However, similar to Alternative 1, base practices and personnel training would minimize adverse effects. There would be no significant impact on solid waste and hazardous materials from the construction or implementation of Alternative 2.

3.11.3.3 Alternative 3: Eastern Site

Construction/Short-term Impacts

Waste generated during site preparation activities and construction of the Alternative 3 pier and upland facilities would be similar to waste generated under Alternative 1. There would be additional waste from the construction of a wave attenuation structure. All construction waste, including solid and hazardous waste, would be disposed of by the construction contractor in accordance with applicable construction waste and hazardous waste laws and regulations.

Operation/Long-term Impacts

The use of hazardous materials and generation of solid waste would be similar to Alternative 1.

Conclusion

Similar to Alternatives 1 and 2, Alternative 3 would also increase the use of hazardous materials and generation of solid waste. However, similar to Alternatives 1 and 2, base practices and personnel training would minimize the adverse effects. There would be no significant impact on solid waste and hazardous materials from the construction or implementation of Alternative 3.

3.11.3.4 No Action Alternative

Under the No Action Alternative, the Navy would not construct a permanent TPS forward deployed operational pier, and TPS operations would continue to operate as they currently do. As a result, the volume of hazardous materials used and solid waste generated at USCG AIRSTA/SFO Port Angeles would not change.

3.12 Summary of Impacts

A summary of the potential impacts associated with each of the action alternatives and the No Action Alternative, and of impact avoidance and minimization measures, is presented in Table 3.12-1. None of the action alternatives analyzed would result in significant impacts to the human environment. Alternative 1 is the Preferred Alternative because it meets the purpose and need and avoids long term impacts to the Puget Sound Pilots Station and recreational and ecological resources at the rock pile that would occur with implementation of Alternative 2. Additionally, Alternative 1 is responsive to public concerns regarding siting. Alternative 1 avoids impacts to the expansive eelgrass beds associated with Alternative 3 which is also some of the last undeveloped land on Ediz Hook.

Table 3.12-1. Summary of Impacts for the Action Alternatives

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
Land Use and Recreation				
Construction Impacts	Construction would not displace any land uses, or affect zoning or land use designations. Construction would not displace existing recreational sites, facilities, or uses in upland areas or on the shoreline, but would temporarily increase noise, traffic, and visual clutter. Small non-motorized watercraft that traverse close to the shore would temporarily be prohibited from the in-water construction area and would have to traverse the area at a greater distance from the shore.	Construction impacts on land use would be similar to Alternative 1. Access to scuba diving on the rock pile would be prohibited during construction due to safety issues, as the pier would be constructed directly over the rock pile. Other impacts on recreation would be similar to Alternative 1 but of greater intensity due to construction activities being closer to recreation sites on Ediz Hook.	Construction impacts on land use would be similar to Alternative 1. Construction would cause temporary impacts on recreation similar to Alternative 1, but would be of less intensity due to the farther distance from the recreation sites on Ediz Hook.	Under the No Action Alternative, there would be no construction of onshore or in-water facilities and no impacts on land use or recreation.
Operation Impacts	The TPS facilities are compatible with the existing land uses and zoning, and would not displace any existing land uses. The TPS pier would extend into DNR's aquatic lands leased by Icicle Seafoods for its floating fish pens. The proposed treaty mitigation would affect existing land uses in DNR aquatic tidelands, but is consistent with the goals to restore nearshore and shoreline areas on Ediz Hook. There would be no alterations to any existing recreation sites and no loss of a designated recreation area. Recreational boaters would be	Operation impacts would be similar to Alternative 1, except that the TPS pier would not extend into the Icicle Seafoods lease area. There would be a loss of access to the scuba diving site (the rock pile) near the jetty due to security restrictions. The rock pile is not a designated recreation site, and other diving opportunities are present in the general area; no significant impact is anticipated.	Operation impacts on land use and recreation would be similar to Alternative 1, except that the TPS pier would not extend into the Icicle Seafoods lease area.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impacts on land use or recreation.

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	restricted from entering the NVPZ while BVs are moored and from entering the security zone that the USCG would establish around the TPS pier after it is constructed.			
Water Quality and Sediments				
Construction Impacts	Alternative 1 would result in temporary, localized disturbance of sediments and increases in turbidity. Compared to the other action alternatives, Alternative 1 would create the most turbidity due to the greater number of piles. There is a minor risk of accidental releases of solid waste (asphalt, concrete, metal, wood, excavated soil) and hazardous waste (hydraulic fluid, oil, fuel, solvents, paint thinner) during construction that could result in temporary, localized effects on water quality. Temporary impacts on water quality would not violate any federal or state standards for water quality.	Alternative 2 construction impacts on water quality and sediments would be similar to Alternative 1. This alternative would have the least effect on sediment disturbance and creation of turbidity due to fewer piles.	Alternative 3 construction impacts on water quality and sediments would be similar to Alternative 2. However, there would be additional sediment disturbance and turbidity from construction of the breakwater.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and no effects on water quality or sediments would occur.
Operation Impacts	New in-water structures such as the pier would have a localized effect on water circulation near the new	Operation impacts on water quality and sediments would be similar to Alternative 1. The floating pontoon	Alternative 3 would have the highest potential to affect circulation in the harbor near the	Under the No Action Alternative, the TPS pier and onshore support

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	piles. Steel piles can corrode over time but would be equipped with cathode protection, thus minimizing impacts on water quality. There is a potential for accidental spills to occur over time, but spill prevention plans and BMPs for fueling would be used to avoid and minimize impacts.	would split surface currents at the site, but this effect would also not affect longshore currents or sediment transport and would have a negligible effect on water quality and sediments.	project area due to the addition of the breakwater. However, the breakwater would not extend to the seafloor, which would help maintain the longshore current.	facilities would not be constructed, and no effects on water quality or sediments would occur.
Biological Resources				
Construction Impacts	Airborne noise from pile driving may cause birds to avoid the area temporarily and may affect ESA-listed marbled murrelets by potentially masking their vocalizations. Underwater noise during impact pile driving would be localized and temporary, but may affect ESA-listed Puget Sound Chinook ESU, Puget Sound steelhead DPS, Hood Canal summer-run chum ESU, bull trout, Pacific eulachon southern DPS, and North American green sturgeon southern DPS. Pile driving would primarily be vibratory and occur within the in-water work window of July 16 through February 15 when juvenile salmonids are least likely to be present. Pacific eulachon and North American green sturgeon are rare within the harbor in general and would likely not be affected as they would be found farther offshore in the Strait	Construction impacts on biological resources would be similar to Alternative 1. However, Alternative 2 would result in a greater impact on marine vegetation, invertebrates, juvenile fish, and EFH because the pier would be constructed over the existing rock pile, which supports a more diverse and complex biological community than the neighboring intertidal zones.	Construction impacts on biological resources would be similar to Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and no effect on biological resources would occur.

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	of Juan de Fuca waters. Adult ESA-listed salmonids would also occur farther offshore and would not be significantly impacted by pile driving noise. No significant impacts on Puget Sound Chinook ESU, bull trout, or North American green sturgeon DPS designated critical habitat would result under this alternative. Alternative 1 is not expected to result in mortality, injury, or behavioral disturbance to ESA-listed Southern Resident killer whales or humpback whales, as the 120-dB RMS behavioral zone would be monitored during pile driving and shutdown implemented if these whales are observed within this zone. No significant impacts would occur on Southern Resident killer whale critical habitat as pile driving would occur during the in-water work window, avoiding and minimizing impacts on their prey. A marine mammal IHA Application has been prepared under the MMPA to request Level B take for pinnipeds and harbor porpoise that occur or may occur in the area during pile driving. The cetacean behavioral threshold zones and pinniped injury threshold zones would be monitored during impact pile driving under all three action			

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	alternatives, with shutdown occurring if these marine mammals are observed. To a lesser degree, pile driving would create turbidity, reduced dissolved oxygen, and resuspension of marine sediment that would temporarily impact marine fish (including ESA-listed species), benthic invertebrates, and EFH. A greater loss of seafloor habitat from pile placement and direct loss of less mobile benthic invertebrates would occur under Alternative 1 as compared to the other action alternatives.			
Operation Impacts	Alternative 1 would result in 25,465 ft^2 of total overwater coverage, and 8,650 ft^2 of nearshore overwater coverage (shallower than -30 feet MLLW) and shading of marine vegetation. This alternative would result in less total overwater coverage than Alternative 2 or Alternative 3, but greater nearshore overwater coverage than Alternative 2. The nearshore overwater coverage would shade approximately 4,595 ft^2 of eelgrass habitat. Implementation of the compensatory mitigation and treaty mitigation would restore nearshore intertidal habitat.	Alternative 2 would result in 29,976 ft^2 of total overwater coverage, and 1,780 ft^2 of nearshore (shallower than -30 feet MLLW) overwater coverage and shading of marine vegetation. This alternative would result in greater total overwater coverage than Alternative 1, but less than Alternative 3, and less nearshore overwater coverage than Alternative 1 and Alternative 3. The nearshore overwater coverage would shade approximately 1,780 ft^2 of eelgrass habitat as well as a portion of the underwater rock pile that provides vegetation, prey, refugia, and EFH.	Alternative 3 would result in 33,136 $ft^2$of total overwater coverage and 33,136 ft^2 of nearshore (shallower than -30 feet MLLW) overwater coverage and shading of marine vegetation. This alternative would have greater total overwater coverage and nearshore overwater coverage than Alternative 1 or Alternative 2. The nearshore overwater coverage would shade approximately 15,233 ft^2 of eelgrass habitat.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and no effect on biological resources would occur.
Noise				
Construction	Construction noise would attenuate	Noise impacts from pile driving	The Puget Sound Pilots Station	Under the No Action

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
Impacts	to or close to ambient levels at the closest residences in downtown Port Angeles and would have minor temporary impacts, primarily during pile driving. Noise levels at the Puget Sound Pilots Station would be approximately 68 dBA during vibratory pile driving and approximately 77 dBA during impact pile driving; interior noise levels would be approximately 43 dBA during vibratory pile driving and 52 dBA during impact pile driving. Pile driving would last a maximum of 4 hours per day for up to 75 days over a period of 18 weeks. Construction noise is exempt from state and local noise standards during daytime hours so this is not considered to be a significant impact.	would be greater in magnitude/intensity than under Alternative 1 because the Puget Sound Pilots Station is closer to the project site, approximately 350 feet to the west. Noise levels at the Pilots Station would be approximately 84 dBA during vibratory pile driving and approximately 93 dBA during impact pile driving. Interior noise levels at the Pilots Station would be approximately 59 dBA during vibratory pile driving and 63 dBA during impact pile driving, and could result in intermittent short-term interference with sleep during daylight hours and indoor speech and communication. Earplugs could be used to reduce noise during pile driving. Alternative 2 would only require 15 days of pile driving over a period of 5 weeks, about 1/5 of the time required under Alternative 1.	would experience temporary noise levels up to 61 dBA during vibratory pile driving and periodic noise levels up to 70 dBA during impact pile driving in outdoor areas. Interior noise levels at the Pilots Station would be approximately 36 dBA during vibratory pile driving and 45 dBA during impact pile driving, considered to be relatively quiet. The duration of noise impacts would be shorter (1/3 of the time) than under Alternative 1 and slightly longer than Alternative 2 (10 days more).	Alternative, the TPS pier and onshore support facilities would not be constructed, and no noise impacts on adjacent land uses would occur.
Operation Impacts	Operation of the TPS vessels and upland facilities would not increase ambient noise levels above noise standards.	Similar to Alternative 1.	Similar to Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and TPS vessels would not port at USCG AIRSTA/SFO Port Angeles. No noise impacts on adjacent

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
				land uses would occur.
Cultural Resources				
Construction Impacts	There would be a very low risk for impacts on cultural resources due to minimal depth of ground disturbance. The top 5 feet of the ground is composed of fill placed in modern times.	Similar to Alternative 1. Under Alternative 2, other compensatory mitigation would need to be developed in coordination with the USACE.	Similar to Alternative 1.	Under the No Action Alternative, no TPS facilities would be constructed. No impacts on cultural resources would occur.
Operation Impacts	There would be no operational impacts on cultural resources with the implementation of Alternative 1.	Similar to Alternative 1.	Similar to Alternative 1.	Under the No Action Alternative, no impacts would be anticipated.
American Indian Traditional Resources				
Construction Impacts	Construction would have a temporary impact on access to American Indian traditional resources.	Construction impacts would be similar to those under Alternative 1.	Construction impacts would be similar to those under Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and no impacts on American Indian traditional resources would occur.
Operation Impacts	Potential impacts to habitat supporting harvestable marine resources through reduction and degradation of nearshore intertidal habitat. Implementation of the treaty mitigation would restore nearshore intertidal habitat, offsetting the loss of a similar area due to the pier construction. The Security Zone surrounding the TPS pier and the Naval Protection Zone surrounding vessels while they are docked at the pier would temporarily prevent access to	Impacts similar to those under Alternative 1, except that In-water structures would result in greater reduction and degradation of nearshore intertidal habitat than under Alternative 1. Same treaty mitigation as Alternative 1.	Same as Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impacts on American Indian traditional resources.

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	waters and nearshore intertidal habitat within these zones."			
Socioeconomics				
Construction Impacts	Construction would take place over approximately 18 months, and construction activities are expected to generate up to 267 construction jobs from the estimated $27 million in construction costs. According to the economic model, construction could generate $2.6 million in federal taxes and $1.7 million in state and local taxes. No disproportionately high and adverse human health or environmental effects on minority populations and low-income populations are anticipated. Aquaculture would be adversely affected by construction from a shortened fish crop season and delay to the next rearing cycle. The loss of revenue associated with early harvest could be up to $3 million based on Navy estimates, or more than $6 million based on Icicle Seafoods estimates. Loss of revenue could exceed $18 million if early harvest does not occur or impact pile driving is delayed and occurs when fish are in the pens.	Construction would take place over 12 months, and construction activities are expected to generate up to 304 construction jobs from the estimated $30.7 million in construction costs. Construction could add $2.9 million in federal taxes and $1.9 million in state taxes. Impacts on minority and low-income populations during construction would be similar to those under Alternative 1. There would be no adverse impacts on commercial or recreational fishing. Aquaculture impacts would be similar but potentially less than under Alternative 1 because the in-water construction duration would be shorter. If early harvest is necessary or does not occur, or if impact pile driving occurs when fish are in the pens, loss of revenue would be similar to amounts estimated for Alternative 1.	Construction would take place over 14 months, and construction activities are expected to generate up to 332 jobs from the $33.6 million in construction costs. Construction could add $3.2 million in federal taxes and $2.1 million in state taxes. Impacts on minority and low-income populations during construction would be similar to those under Alternative 1. There would be no adverse impacts on commercial or recreational fishing. Alternative 3 would have no aquaculture effects due to the distance from the fish pens.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no associated temporary benefit to the area economy.
Operation Impacts	Alternative 1 would not result in an increase of any permanent population. Housing is available, and should any TPS personnel	Operation impacts on population and housing would be similar to those under Alternative 1. Operations would contribute	Operation impacts on population and housing would be similar to those under Alternative 1. Operations would contribute	Under the No Action Alternative, the TPS pier and onshore support facilities would not be

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	house off base there would not be a shortage of housing. There is no permanent change of duty station for TPS military personnel, as this provides for a forward staging of vessels only. The estimated direct, indirect, and induced impacts from estimated annual operating costs of $180,000 include wages of about $72,000 and an economic output of about $274,000. Operation could generate $17,498 annually in federal taxes and $12,770 in state and local taxes. No disproportionately high and adverse human health or environmental effects on minority populations and low income populations are expected. Commercial fishing would not be affected by Alternative 1. Recreational fishing would not be impacted by operation. There would be slightly altered access to the fish pens due to the security restrictions around the moored TPS vessels. There would be no impacts affecting water circulation near the fish pens.	directly and indirectly to the economy through an estimated $220,000 in annual operation costs. The estimated direct, indirect, and induced impacts from annual operating costs include wages of about $88,000 and an economic output of about $335,000. Operation could generate $21,386 annually in federal taxes and $15,609 in state and local taxes. Impacts on minority and low-income populations, commercial and recreational fishing, and aquaculture would be similar to those under Alternative 1.	directly and indirectly to the economy through $220,000 in annual operation costs. The estimated direct, indirect, and induced impacts from annual operation costs include wages of about $88,000 and economic output of about $335,000. Operation could generate $21,386 annually in federal taxes and $15,609 in state and local taxes. Impacts on minority and low-income populations, and commercial and recreational fishing would be similar to those under Alternative 1. Alternative 3 would have no effects on aquaculture.	constructed, and there would be no associated long-term benefit to the area economy.
Marine Traffic and Transportation				
Construction Impacts	There would be a small increase in marine traffic from construction vessels; however, this would not	Construction impacts on marine traffic would be similar to those under Alternative 1.	Construction impacts on marine traffic would be similar to those under Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	have an adverse effect on marine shipping. Icicle Seafoods would be able to access its floating fish pens throughout construction. The construction zone would be off-limits to small watercraft, but this would be a minor temporary impact.			facilities would not be constructed, and there would be no impact on marine traffic and transportation.
Operation Impacts	There would be no impact on marine traffic. A portion of the Icicle Seafoods fish pens would be inside the NVPZ for moored BVs, but Icicle Seafood vessels would normally be permitted to transit within the NVPZ in accordance with 33 CFR 165, so that the NVPZ would not substantially affect their operations.	Operation impacts on marine traffic would be similar to those under Alternative 1.	There would be no operation impacts on marine traffic. Neither the Icicle Seafoods fish pens nor the Puget Sound Pilots Station would be within the NVPZ for moored BVs, so there would be no potential impacts on their operations.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impact on marine traffic and transportation.
Shore Traffic and Circulation				
Construction Impacts	Construction traffic could result in some congestion and short delays near the entrance gate to USCG AIRSTA/SFO Port Angeles that could also affect access to the public boat launch. Construction traffic would be managed to ensure unrestricted access to the boat launch by users, and a Traffic Control Plan would be prepared to minimize traffic delays.	Construction impacts on shore traffic would be similar to those under Alternative 1.	Construction impacts on shore traffic would be similar to those under Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impact on shore traffic and circulation.
Operation Impacts	There would be no operation impacts on shore traffic.	Similar to Alternative 1, there would be no operation impacts on shore traffic.	Similar to Alternative 1, there would be no operation impacts on shore traffic.	Under the No Action Alternative, the TPS vessels would not port at USCG AIRSTA/SFO Port Angeles, and there

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
				would be no impact on shore traffic and circulation.
Visual Resources				
Construction Impacts	Construction equipment and activities would increase visual clutter, but no views would be blocked. Changes to visual quality would be temporary and localized, mainly affecting views of the project area from nearby areas on Ediz Hook such as the public boat launch.	Construction impacts on visual resources would be similar to those under Alternative 1, except that this alternative would be closer to nearby areas such as the public boat launch, causing greater visual disturbance.	Construction impacts on visual resources would be similar to those under Alternative 1, except that Alternative 3 would be farther from nearby areas such as the public boat launch than Alternatives 1 or 2, resulting in less visual disturbance.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impact on visual resources during construction.
Operation Impacts	There would be a change to views of the site due to the new pier and upland facilities. However, the views of the proposed facilities would be compatible with the existing on-site facilities, and the overall change at land-based public viewpoints and from the water would be relatively small.	Operation impacts on visual resources would be similar to those under Alternative 1.	Operation impacts on visual resources would be similar to those under Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not be constructed, and there would be no impact on visual resources over the long term.
Solid Waste and Hazardous Materials				
Construction Impacts	Construction would generate solid and hazardous waste and involve the use of materials that can be	Construction impacts on solid waste and hazardous materials would be similar to those under	Construction impacts on solid waste and hazardous materials would be similar to those under	Under the No Action Alternative, the TPS pier and onshore support

Resource Area	Alternative 1: Midwestern Site	Alternative 2: Western Site	Alternative 3: Eastern Site	No Action Alternative
	hazardous such as paints, solvents, lubricants oil, engine oil, and fuel. There is some potential for spills to occur during overwater construction.	Alternative 1.	Alternative 1.	facilities would not be constructed, and there would be no increase in solid waste or hazardous materials.
Operation Impacts	Operations would generate solid and hazardous waste and increase the levels produced at USCG AIRSTA/SFO Port Angeles. Operations would involve the use of materials that can be hazardous such as paints, solvents, lubricants oil, engine oil, and fuel.	Operation impacts from solid waste and hazardous materials would be similar to those under Alternative 1.	Operation impacts from solid waste and hazardous materials would be similar to those under Alternative 1.	Under the No Action Alternative, the TPS pier and onshore support facilities would not constructed at USCG AIRSTA/SFO Port Angeles, and there would be no increase in solid waste or hazardous materials or associated impacts.

4.0 Cumulative Impacts

CEQ regulations implementing the procedural provisions of NEPA define cumulative impacts 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).

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 analyses normally encompass a Region of Influence (ROI) or geographic boundaries beyond the immediate area of a proposed action, and a time frame including past actions and foreseeable future actions, to capture these additional effects.

For the Proposed Action to have a cumulatively significant impact on an environmental resource, two conditions must be met. First, the combined effects of all identified past, present, and reasonably foreseeable projects, activities, and processes on a resource, including the effects of the Proposed Action, must be significant. Second, the Proposed Action must make a substantial contribution to that significant cumulative impact. To analyze cumulative effects, a cumulative effects region must be identified for which effects of the Proposed Action and other past, present, and reasonably foreseeable actions would occur.

The Proposed Action consists of in-water work in the marine environment and upland work. For this cumulative effects analysis, the ROI is Port Angeles Harbor and the surrounding shoreline along Ediz Hook and the Port Angeles waterfront, except Land Use and Recreation (which use Ediz Hook as the ROI); and Solid Waste and Hazardous Materials (which uses USCG AIRSTA/SFO Port Angeles and immediately surrounding area as the ROI).

This analysis depends on the availability of data and the relevance of effects of past, present, and future actions. Although certain data (e.g., extent of forest cover) may be available for extensive periods in the past (i.e., decades), other data (e.g., water quality) may be available for much shorter periods. Because specific information and data on past projects and actions are usually scarce, the analysis of past effects is often qualitative (CEQ 1997).

Table 4-1 lists the past, present, and reasonably foreseeable future actions within the ROI that have had, continue to have, or would be expected to have some impact on the natural and human environment. The projects in this table are limited to those implemented in the last 5 years or those with ongoing contributions to environmental effects. Projects with measureable contributions to impacts within the ROI for a resource area were included in the cumulative impacts analysis.

Table 4-1. Past, Present, and Reasonably Foreseeable Future Projects within the ROI

Project	Project Description	Project Timeframe		
		Past	Present	Future
USCG AIRSTA/SFO Port Angeles, JP5 Fuel System Replacement	This project removed aging 20,000-gallon JP-5 fuel tanks, replacing them with two 9,000-gallon tanks for a total of 18,000 gallons. The work was completed in April 2015. Construction lasted approximately 6 months and no overwater work was performed (Calvert 2015).	X		
USCG AIRSTA/SFO Port Angeles, Construction of Covered Moorings	The project would involve the installation and operation of new covered moorings and a floating dock with a 90-foot long access pier connected to the shore west of the existing T-Pier. A new log boom would be constructed west of the covered moorings and floating dock. The project would involve the installation of 110 concrete piles with approximately 27.5 hours of impact pile driving and would result in 6,100 ft^2 of additional overwater shading from the floating dock. The project is not currently funded and the construction schedule is unknown at this time (Lindstrom 2015; USCG 2008).			X
USCG AIRSTA/SFO Port Angeles, T-Pier, Floating Docks, & Breakwater Maintenance, Pile Replacement	The USCG conducts a condition assessment every 5 years of the existing T-Pier and floats, and replaces damaged piles, decking, and sections of the wave screen as needed. The USCG anticipates that it will be necessary to replace piles on the existing T-Pier, floating docks, and free-standing wave attenuation structure within the next 5 years. This would involve the removal of old piles and the installation of new piles, and may involve maintenance or replacement of related structures (Lindstrom 2015).			X
City of Port Angeles, Downtown Waterfront Development Project	The City of Port Angeles Waterfront and Transportation Improvement Plan (City of Port Angeles 2015a) includes the redevelopment of public amenities, including a pedestrian walkway esplanade, resurfaced automobile and pedestrian areas, an expansion and redevelopment of the Hollywood Beach area, a new west end park near Valley Creek Estuary, and a pedestrian bridge from Municipal Pier to the west side of Peabody Creek. Construction of Phase I of the Waterfront Plan was launched in November 2012 and included redevelopment of the waterfront. Phase II of the Waterfront Plan, currently under construction, includes the West End Park, adjacent to the west of the Esplanade at Railroad Avenue and Oak Street. Construction of the West End Park includes the creation of two pocket beaches and trail construction (West 2015; City of Port Angeles 2015a).	X	X	X
City of Port Angeles, Combined Sewer Overflow Reduction Project	The City of Port Angeles began designing and building projects to implement its CSO Reduction Plan in 2012. The Phase I and II projects extend from downtown Port Angeles, along the waterfront, and the Olympic Discovery Trail, through to the former Rayonier Mill site, to the city's Wastewater Treatment Plant (WWTP), a distance of around 1.7 miles. Construction of the Phase I projects began in August 2012. The Phase I project included increasing the size of the sewer force main between downtown and the WWTP and relocating it away from the shoreline and out of the harbor, retrofitting the old Rayonier	X	X	X

Project	Project Description	Project Timeframe		
		Past	Present	Future
	industrial outfall to be the city's primary WWTP outfall, which would discharge wastewater farther from Port Angeles Harbor, and making improvements to the WWTP. Construction of the Phase II projects began in 2014 and will be completed by the fourth quarter of 2015. Prior to the project, when rainfall was low to moderate, both stormwater and wastewater would go to the WWTP before being discharged into Port Angeles Harbor. During heavy rains, untreated stormwater and wastewater were often discharged together at CSOs without treatment. An estimated 30 million gallons per year of untreated sewage were being discharged. The two-phased projects together are expected to reduce the frequency of CSOs to less than one overflow per outfall per year (West 2015; City of Port Angeles 2015b, c).			
Rayonier Mill Site Cleanup (Rayonier Properties LLC)	The Rayonier Mill site on the southern shoreline of Port Angeles Harbor is the second identified sediment cleanup site in Port Angeles Harbor. In 2010, Rayonier signed an Agreed Order with Ecology to prepare an interim action plan for the Rayonier Mill Study Area. The full extent of the Rayonier Mill Site has not been determined, and an additional order is needed to implement the plan (Ecology 2016). Ecology completed sediment investigations in 2008, and all existing marine data were compiled in the Marine Data Summary Report in November 2014 (Windward 2014). Ecology expects to release the public comment report for the Marine Data Summary Report in 2016 (Ecology 2016).			X
Lower Elwha Klallam Tribe & City of Port Angeles, Ediz Hook Beach Restoration Project	The Ediz Hook Nearshore Restoration project, a partnership between DNR and the Lower Elwha Klallam Tribe, was implemented in three phases. Phase I, conducted prior to 2008, restored 1,800 linear feet of shoreline on Ediz Hook and included grading and placement of 22,000 cubic feet of sand, installation of large woody debris (LWD), and revegetation with native dune grass and wildflowers. Phase II involved the removal of a derelict 770-foot long creosote-treated structure, as well as the restoration of more than 1,200 linear feet of shoreline along central Ediz Hook. The Phase III project included the demolition and removal of fill, concrete debris, asphalt, riprap, pile stubs, and bulkheading; regrading; and restoration including placement of LWD for stabilization along with buried riprap to protect the adjacent road, placement of gravel and sand to replace fill material and backfill between the road edge and LWD; and native plantings (West 2015).	X		
Ediz Hook Beach Nourishment Maintenance Cycle, Ediz Hook Beach Erosion Control Project, Clallam County, Washington	The purpose of the erosion control project was to protect the sand spit from erosion, thereby protecting Port Angeles Harbor and the small boat basin from direct wave action, and maintaining access to USCG AIRSTA/SFO Port Angeles. The project consisted of beach nourishment with rounded gravel and cobbles on two sections on the northwest side of Ediz Spit in the fall of 2011. Armor rocks that have fallen from the revetment onto the beach or moved during construction were re-keyed into the revetment (USACE 2011).	X		

Project	Project Description	Project Timeframe		
		Past	Present	Future
Green Point Aquaculture Proposal	Icicle Seafoods, Inc. proposed in 2015 to relocate the Atlantic salmon fish farm operation currently in Port Angeles Harbor to a new location in the Strait of Juan de Fuca off Green Point, approximately 2 miles east of the harbor entrance. The proposed new location would offer improved water flow and allow expansion from about 820,000 salmon to 1.1 million fish, using plastic pens in place of the current nets. Icicle Seafoods has applied for local, State of Washington, and federal permits for the relocation (Rice 2016).			X
Northwest Training and Testing (NWTT)	Navy at-sea training and testing activities are addressed in a Final EIS that: • Reassessed the environmental impacts of Navy at-sea training and testing activities contained in three separate EIS/OEISs and various earlier environmental planning documents, and consolidated these analyses into a single environmental planning document, including the following: o Northwest Training Range Complex (NWTRC) Final EIS/OEIS (Navy 2010a) o Naval Sea Systems Command (NAVSEA) Naval Undersea Warfare Center (NUWC) Keyport Range Complex Extension Final EIS/OEIS (Navy 2010b) o Southeast Alaska Acoustic Measurement Facility (SEAFAC) Final EIS (Navy 1988) • Updated environmental analyses with the best available science and most current acoustic analysis methods to evaluate the potential effects of training and testing activities on the marine environment. • Analyzed the potential environmental impacts of training and testing activities in areas where training and testing historically occur but which have not been previously analyzed, including Navy ports and shipyards. • Updated the at-sea environmental impact analyses in the previous documents to account for planned force structure changes for 2015 to 2020 and the development of supporting weapons, platforms, and systems. • Adjusted baseline training and testing activities from current levels to the level needed to support Navy training and testing requirements beginning October 2015 to include other activities and sound sources not addressed in the previous analyses. • Supported authorization of incidental take of marine mammals under the MMPA and incidental take of threatened and endangered species under the ESA.			X

4.1 Land Use and Recreation

Historical land development on Ediz Hook converted the natural sand spit to land uses ranging from military to industrial, commercial, and recreational and had a significant adverse cumulative impact on previous land uses.

Currently, most of the spit outside of USCG AIRSTA/SFO Port Angeles is owned by the federal government and leased long-term to the city, no longer has industrial or commercial uses, and is considered open space. Industrial and commercial uses remaining on Ediz Hook (and in the adjacent marine waters of Port Angeles Harbor) include Nippon Paper Industries, Icicle Seafoods' on-land support facilities and floating net pens for raising juvenile Atlantic salmon, the Puget Sound Pilots Station dock and office building, and the PoPA's offshore log raft storage located on DNR lease lands. Public and tribal land uses on Ediz Hook include the PoPA Ediz Hook Boat Launch and the city and tribal parks and recreational facilities described in Section 3.1 (*Land Use and Recreation*). Overall, public land uses on Ediz Hook encompass 137.3 acres. Industrial and commercial land uses encompass 77 acres (BST Associates 2010). Approximately 53 acres of the land area on Ediz Hook is within the 200-foot shoreline jurisdiction. Most of USCG AIRSTSA/SFO Port Angeles is within the 200-foot shoreline jurisdiction and is designated High-Intensity Marine (City of Port Angeles 2007). USCG AIRSTA/SFO Port Angeles is used primarily for air operations, but also has a large USCGC assigned, utilizing the T-Pier's outer berth, and a Small Boat Station, utilizing the small boat floats that are attached to the main T-Pier. The entire central portion of the spit, including the boat launch and city and tribal parks, is within 200 feet of the shoreline and designated Urban Conservancy-Recreation (City of Port Angeles 2007). Industrial areas around the Nippon Paper Plant within the 200-foot shoreline jurisdiction are designated High Intensity-Industrial (City of Port Angeles 2007). The harbor is designated Aquatic-Harbor (City of Port Angeles 2007).

Land use goals and policies outlined in the City of Port Angeles' Comprehensive Plan (City of Port Angeles 2010), Shoreline Management Plan (The Watershed Company 2012), and HRMP (City of Port Angeles 2011a) provide for a balance between industrial/commercial uses (including water-dependent uses), retention of open space, continued development of recreational land uses, and restoration of the natural environment. Recent, ongoing, and planned actions by the city, USACE, DNR, Lower Elwha Klallam Tribe, and other entities indicate a trend toward meeting these goals (Table 4-1). For example, the Ediz Hook Beach Restoration Project removed derelict structures from past industrial/commercial land uses and restored 3,000 linear feet of shoreline in the central portion of Ediz Hook along its southern shoreline. Overall, recent and ongoing actions have had a significant beneficial cumulative impact on land use. Planned and future actions would be required to comply with land use goals and policies and are also expected to have a beneficial cumulative impact on land use and recreation.

The Proposed Action would not contribute to a significant adverse cumulative impact on land use because past and ongoing actions have resulted in a significant beneficial cumulative impact, and future planned actions and the Proposed Action would be in compliance with local land use goals and policies.

Overall, recreation resources and opportunities on Ediz Hook and adjacent waters have been increasing with the decline of industrial and commercial land uses, development and improvement of recreational facilities and public access, and shoreline restoration activities. Planned and other future actions would be required to comply with land use goals and policies, including recreation goals, and are also expected to contribute to a beneficial cumulative impact

on recreation. The Proposed Action would establish a restricted zone (i.e., the NVPZ) in the project area. Alternative 2 would permanently prevent future access to the rock pile, reducing recreational diving opportunities in the Ediz Hook nearshore. Additionally under Alternative 2, the Proposed Action would eliminate access within 100 yards of the Alternative 2 site by Olympic Peninsula Rowing Association members, who currently row along the south shore of Ediz Hook between the Ediz Hook Boat Launch and the Alternative 2 site. However, the Proposed Action would not substantially contribute to a significant adverse impact on recreation, because past and ongoing actions have resulted in an increase in recreational opportunities, resulting in a beneficial cumulative impact, and planned and future projects are also expected to contribute to a beneficial cumulative impact.

4.2 Water Quality and Sediments

Wood waste and sediment from wood-base industries, effluent from various mills, leaks from fuel storage facilities, spills from shipbuilding activities, CSO outfalls, leaking septic systems, unfiltered stormwater runoff, and shoreline structures that influence local currents (e.g., wave barriers, docks, jetties) have all contributed to poor water quality and sediment contamination in Port Angeles Harbor (City of Port Angeles 2011a, Ecology 2014c; The Watershed Company 2012, The Watershed Company et al. 2012). The harbor also receives direct surface water discharge from six freshwater streams, all of which have varying degrees of residential and commercial land use influences, and five of which have impaired water quality (The Watershed Company et al. 2012). The city, federal and state regulatory agencies, and the tribes have implemented, planned, or identified a variety projects and opportunities to improve water quality in Port Angeles Harbor, including stormwater improvements, the city's CSO Reduction Project currently under construction (Table 4-1), shoreline/beach restoration projects along the middle portion of Ediz Hook (Table 4-1) and in other areas in Port Angeles Harbor, and the identification of remedial actions in the western portion of Port Angeles Harbor and the former Rayonier Mill site (City of Port Angeles 2015b; The Watershed Company 2012; The Watershed Company et al. 2012). Past actions have had a significant adverse impact on local circulation, water quality, and sediments in Port Angeles Harbor. However, changes in land use, including the reduction of industrial and commercial land uses on Ediz Hook, and recent and ongoing projects, such as the city's CSO Reduction Project and Lower Elwha Klallam Tribe and USACE Ediz Hook Beach Restoration projects, are having a beneficial cumulative impact on local currents, water quality, and sediments. Planned future actions, including remedial actions by the PoPA, are also expected to substantially contribute to beneficial cumulative impacts on water quality and sediments.

The Proposed Action would include the addition of in-water structures that would have some localized effects on circulation. However, proposed compensatory mitigation for the loss of aquatic resources and treaty mitigation would include the removal of the rock-lined jetty and the Icicle Seafoods laydown area on inner Ediz Hook. These in-water structures currently affect circulation in the North Harbor area, and their removal would offset the localized circulation impacts created by the proposed in-water structures and would provide an overall benefit to circulation in the North Harbor area. The Proposed Action, combined with the past, present, and reasonably foreseeable future projects, would not result in significant adverse impacts on water quality and sediments.

4.3 Biological Resources

Existing in/overwater structures, such as the Ediz Hook Boat Launch and existing T-Pier on Ediz Hook, in addition to other piers along the Port Angeles downtown waterfront and at the base of

Ediz Hook (Nippon Paper Industries), have contributed to a cumulative reduction in marine vegetation (e.g., eelgrass, kelp, algae), reduction in refugia for juvenile forage fish, a reduction of juvenile prey species, and adverse impacts on critical habitat and EFH in Port Angeles Harbor. Recent beach and shoreline restoration activities (Table 4-1), including the removal of derelict in/overwater structures, have likely improved conditions and partially offset these past impacts. The overall trend on Ediz Hook outside of the USCG AIRSTA/SFO Port Angeles nearshore area has been restoration, resulting in an overall cumulative benefit to marine vegetation and juvenile fish habitat, critical habitat, and EFH.

The planned USCG Covered Moorings Project includes a trestle and pier that would shade eelgrass. Compensatory mitigation would be required to offset these impacts and would be negotiated under a separate action during consultation. With compensatory mitigation from the Covered Moorings Project in combination with the compensatory mitigation and treaty mitigation proposed for the TPS pier, this project would not contribute to past adverse impacts on marine vegetation and juvenile fish habitat, PCEs for Chinook salmon, and bull trout critical habitat.

The potential cumulative impacts of the Proposed Action on marine vegetation and juvenile fish are also primarily related to overwater nearshore shading from the proposed TPS pier. The Proposed Action would result in nearshore overwater shading of 8,650 ft^2 of eelgrass, kelp, and macroalgae, and would contribute to past and future adverse impacts on marine vegetation and juvenile fish habitat. Further, resulting shade would directly impact approximately 4,595 $ft^2$of eelgrass. The Proposed Action would involve the addition of piles and overwater structures that would degrade nearshore and offshore critical habitat PCEs for Chinook salmon by creating shade and barriers that could reduce food sources, reduce the quality of refugia, and increase their exposure to predators. Overwater coverage could also degrade critical habitat PCEs for bull trout by reducing food source availability and adversely impact Pacific Coast groundfish EFH. The Navy is consulting with the relevant agencies and preparing a Mitigation Plan to compensate for these impacts. With proposed compensatory mitigation and treaty mitigation, the Proposed Action would not contribute to past and future adverse cumulative impacts on marine vegetation, juvenile fish habitat, designated PCEs, or EFH in Port Angeles Harbor.

4.4 Noise

A history of high-intensity industrial and commercial land uses on Ediz Hook likely generated higher noise levels than current land uses in the Proposed Action project area. However, industrial and commercial land uses on Ediz Hook have declined, and noise levels on Ediz Hook are currently below the maximum permissible levels for Class B and Class C EDNAs specified in the WAC, indicating that recent and ongoing actions have not had a significant adverse cumulative impact on noise. While land use goals and policies outlined in the City of Port Angeles' Comprehensive Plan (City of Port Angeles 2010), Shoreline Management Plan (The Watershed Company 2012), and HRMP (City of Port Angeles 2011a) provide for a balance between industrial/commercial uses (including water-dependent uses), the trend on Ediz Hook has been toward the retention of open space, continued development of recreational uses, and restoration of the natural environment. There are no indications of planned future development on Ediz Hook that would involve high noise-generating land uses. The Proposed Action is also not expected to increase noise levels on Ediz Hook over the long term. At full implementation of the Proposed Action, TPS vessels would generate noise levels of approximately 53 dBA during vessel idling and 57 dBA during departure. Noise levels at adjacent receiving properties would be within ambient levels, which were measured at 51 to 53 dBA at the Puget Sound Pilots

Station, the closest receiving property. The Proposed Action would not contribute to a significant adverse cumulative impact on noise.

4.5 Cultural Resources

The Proposed Action would have no adverse impact on known historic properties. USCG AIRSTA/SFO Port Angeles contains three historic properties eligible for inclusion in the National Register of Historic Places: the administration building, aircraft hangar, and lighthouse site, but these are located east of the APE and would not be affected by the project.

A potential exists for archaeological resources to occur within the APE. Ediz Hook was visited regularly by the Klallam and friendly tribes throughout the pre-contact and post-contact periods, and a Klallam squatter village was sited on the APE in the early 20th century. Archaeological shovel testing and borehole observations reveal that approximately 5 feet of fill overlies the natural beach surface where any archaeological resources may be found. The Proposed Action would have no effect on historic properties of an archaeological nature contingent upon archaeological monitoring of all excavations extending below 4.5 feet. If historic properties are found as a result of archaeological monitoring or during other construction activities, the Navy will comply with Section 106 of the NHPA to evaluate, and mitigate any adverse effects.

Discussions with tribal representatives regarding the Proposed Action have affirmed their belief that Ediz Hook is part of a larger TCP that includes the Port Angeles Harbor referred to as ĉixw ícən. In consultation with the Lower Elwha Klallam Tribe, the Navy has determined that none of the action alternatives would have an adverse effect on the TCP.

4.6 American Indian Traditional Resources

Past and ongoing land and water uses in Port Angeles Harbor and the surrounding shoreline, including water-dependent industrial and commercial uses of the shoreline and nearshore habitat, have disrupted access to Tribal U&A fishing grounds and degraded harvestable marine resources over the past century. Overwater structures and piers associated with the existing T-Pier, Puget Sound Pilots dock, and Ediz Hook Boat Launch have shaded and displaced nearshore habitat, including eelgrass and kelp beds that provide essential habitat for juvenile and adult fish and shellfish documented within the nearshore environs of Ediz Hook. Extensive shoreline hardening, including the shorelines on Ediz Hook, has also contributed to an adverse impact on these resources. Together, these past and ongoing actions have contributed to a significant adverse cumulative impact on American Indian traditional resources. As described in Section 4.3, *Biological Resources,* recent beach and shoreline restoration activities (Table 4-1) have included the removal of derelict in/overwater structures, and the overall trend on Ediz Hook has been restoration, which has likely improved conditions and partially offset these past impacts.

The planned USCG Covered Moorings Project (USCG 2008) (Table 4-1) includes about 7,360 ft^2 of new nearshore overwater shading over eelgrass beds and 110 concrete piles in nearshore habitat adjacent to the project area, adversely impacting eelgrass beds and nearshore habitat for juvenile and adult fish. This planned project would contribute to an adverse impact on these resources.

The Proposed Action would not contribute to a significant adverse cumulative impact on American Indian traditional resources because it would not substantially alter navigation to fishing areas in Port Angeles or restrict access to fishing in the Strait of Juan de Fuca, and impacts on harvestable marine resources from overwater coverage, and in-water structures

would not occur in fishing areas typically used by the tribes and would not substantially reduce the size of known harvest areas. Additionally, treaty mitigation would include the removal of the Icicle Seafoods laydown area on inner Ediz Hook. This area currently displaces habitat for harvestable marine resources, and its removal would offset impacts resulting from the Proposed Action.

4.7 Socioeconomics

According to the City of Port Angeles Comprehensive Plan (City of Port Angeles 2010), the population of Port Angeles grew by approximately 1 percent per year between 1970 and 2010, to a population of 18,740, and is expected to grow by 5 percent per year over the next 20 years. Housing within the City of Port Angeles grew at a slower rate during the 1990s (3.9 percent vs. 6.3 percent) and between 1996 and 2003 than within rural areas in the city's urban growth area. Historically, the local economy has been heavily based on natural resources, including timber and fisheries resources. Declines in these resource industries, including the closure of the Rayonier Mill, and the decline of salmon and ESA listings of Chinook salmon, summer chum, and bull trout, have drastically reduced the timber and commercial fishing industries. Tourism, the popularity of the Olympic Peninsula as a retirement destination, the marine trades and industries, and manufacturing are growing economic resources, and the economy is currently relatively stable (City of Port Angeles 2010).

The Proposed Action would have no adverse impact on population or housing, the area economy, EJ populations, commercial or recreational fishing, or tourism-related water-oriented activities, and no permanent adverse impact on aquaculture. The Proposed Action would not contribute to cumulative adverse impacts on socioeconomic conditions in Port Angeles, and would contribute to a short-term construction-related beneficial socioeconomic impact.

TPS vessel activities supporting U.S. Navy operations, which were addressed in the Northwest Training and Testing Final EIS/OEIS, are reasonably foreseeable future actions with the potential to contribute to ongoing cumulative effects on the aquaculture enterprise located in Port Angeles Harbor. The fish pens owned and operated by Icicle Seafoods (see Figure 1-3 and Sections 3.7.2.3 and 3.7.3) are exposed to an active commercial harbor environment of vessel activities, airborne and underwater noise, wave action, and corrosion. Staff assigned to operate and maintain the fish pens are exposed to environmental hazards as they access the facilities by small boat, sometimes during severe weather, and engage in diving operations to inspect and maintain the pens and anchor cables.

Because of the proposed pier's proximity to the fish pens, TPS vessel activities in the vicinity of Alternative 1, the Midwestern Site (Preferred Alternative), have a potential to contribute to effects on aquaculture operations. TPS vessels could add to ongoing effects from other vessel activities in Port Angeles Harbor through collision, fouling of fish pen anchor lines, turbulence from bow thrusters and propellers, and underwater noise.

It is unlikely that a TPS vessel would collide with a fish pen array. TPS vessel pilots and crews are highly trained and certified to operate in close proximity to moving Navy submarines in all weather and visibility conditions. The TPS vessels would maintain maximum safe standoff distance from the fish pens as they depart from and approach the pier. With the concurrence of Icicle Seafoods, the Navy would install navigation lights on the northern corners of the fish pens to maximize visibility at night and in fog conditions.

Fouling of mooring lines is also unlikely. The TPS blocking vessels have a draft of 13 to 14 feet, and these vessels would maintain a sufficient standoff from the fish pens to avoid fouling of the

anchor lines that secure the pens to the seafloor. On March 28, 2016, a Navy dive team conducted a dive inspection of the easternmost fish pen mooring system. The weather and water were clear and the tide 3 to 4 feet relative to MLLW. The dive team selected for inspection the moorings closest to the proposed Alternative 1 pier site and vessel maneuvering area. These were the northern moorings designated by Icicle Seafoods as E, F, G, and H and the eastern moorings designated I, J, K, and L. A report provided by Icicle Seafoods titled *Hydrodynamic Risk Assessment of Navy Escort Vessel Operating Near Fish Pen* (Jensen Report; Jensen 2016) identifies the maximum draft for the blocking vessels to be 14 feet. Utilizing a factor of safety of 2 and then rounding up to the nearest whole tenth number, 30 feet was established as the critical depth for potential entanglement of the blocking vessels in fish pen mooring system. Using Geographic Positioning System instruments, the dive team obtained locations of the mooring lines at a depth of 30 feet. Utilizing these locations, the Navy took an additional 60-foot horizontal offset to establish a minimum safe operating distance from the fish pen mooring system. Based on this information, the Navy assessed the risk of entanglement in the fish pen mooring system during docking/undocking maneuvering to be negligible.

Turbulence from bow thrusters and propellers as the TPS vessels depart from and approach the pier could add to turbulence and wakes produced from other vessels as they transit the harbor, augmenting incremental, long-term abrasion to the fish pens and potentially harming individual fish and damaging the cages. TPS vessel operators would minimize this potential by maintaining the maximum safe standoff distance from the pens. TPS vessel crews would employ safety practices, including advance communication, visibility enhancement techniques, and maximum standoff distances, to maintain safe conditions around the TPS pier perimeter.

The Jensen Report assessed two primary risk factors associated with docking operations of the blocking vessels relative to the fish aquaculture pens in Port Angeles Harbor: collision and propeller wash. The analysis was based on one of the TPS blocking vessels currently serving as a Naval submarine escort. Regarding the potential for collision, the report calculates the time it would take for a standing TPS blocking vessel to drift, based on the wind speed and vessel draft. The report also provides probability of wind speeds at the Port Angeles station. The report did not include the probability of other factors and conditions that could lead to a vessel collision, such as the location of the vessel in relation to the fish pens, wind direction, and potential for mechanical or mooring failure. The propeller wash assessment concludes that stern wash from the main propellers would dissipate quickly per unit distance beyond 30 feet from the vessel, and that wash from the bow thrusters would similarly dissipate beyond 40 feet. The velocities provided are for a stationary vessel, and would likely be reduced in a dynamic, tidally influenced condition. Because the TPS blocking vessels would not operate within 40 feet of the fish pens and would maintain maximum safe standoff distances from the pens, propeller wash is not expected to affect the fish pens.

Over the long term, fish in the aquaculture pens will be exposed to cumulative ambient underwater noise from vessel traffic in Port Angeles Harbor. Thruster and propeller sounds from the TPS vessels would add to this cumulative exposure as the vessels depart from and approach the TPS pier at the Alternative 1 site. Evidence on the effects of non-pulsive underwater noise from surface vessels is limited but indicates that fish mortality or tissue damage would not be likely to result from intermittent exposure to noise from vessel bow thrusters and rotating propellers (e.g., UNEP 2012; LGL and JASCO 2005).

Icicle Seafoods has proposed relocating the fish pens from Port Angeles Harbor to a new location in the Strait of Juan de Fuca approximately 2 miles east of the harbor mouth, off Green Point (Rice 2015). Moving the fish pens to a location away from the Alternative 1 site for the

proposed TPS pier would avoid the potential effects on the Icicle Seafoods aquaculture operation addressed in this analysis.

4.8 Marine Traffic and Transportation

In general, marine traffic/transportation and support facilities have increased in Port Angeles Harbor. There are no recent, ongoing, or planned projects that would adversely impact marine traffic and transportation. Potential projects identified in the cumulative impacts analysis for the City of Port Angeles shoreline (The Watershed Company 2012) and in the HRMP (City of Port Angeles 2011a), including expansion of the Port Angeles Marina, replacement of the Ediz Hook Boat Launch west dock, and improvement of public access on Ediz Hook for recreational boaters, would improve support for both industrial/commercial and recreational marine traffic and transportation. Because there are no other recent, ongoing, or planned actions that would adversely impact marine traffic in Port Angeles Harbor, no cumulative impacts are anticipated.

4.9 Shore Traffic and Circulation

Mixed industrial/commercial land uses with recreational land uses have created some adverse cumulative impacts on shore traffic and circulation on Ediz Hook due to conflicts between road traffic, undefined parking areas, and the Ediz Hook Boat Launch with the Waterfront Trail. There are no recent, ongoing, or planned future actions that are or will contribute to an adverse cumulative impact on shore traffic and circulation on Ediz Hook. The City of Port Angeles plans to improve both parking and the Waterfront Trail on Ediz Hook, including organizing and focusing parking areas at public parks and the public boat launch, rerouting the trail through the industrial area at the base of Ediz Hook to reduce crossings, installing highly visible markings and signage for the trail from the industrial area to USCG AIRSTA/SFO Port Angeles, and providing bicycle racks at parks and the public boat launch. These planned future actions would have a beneficial impact on shore traffic and circulation on Ediz Hook. The Proposed Action would have no effect on shore traffic and circulation and therefore would not contribute to adverse cumulative impacts or beneficial cumulative impacts.

4.10 Visual Resources

Historical military, industrial, and commercial land uses on Ediz Hook had a significant adverse cumulative impact on visual resources. The more recent reduction in these land uses on Ediz Hook, ongoing development of parks and retention of open space, and shoreline/beach restoration projects have had a significant beneficial cumulative impact on visual resources through the reduction of visual clutter. Currently, the south shore of Ediz Hook includes several piers and shoreline structures, including the existing T-Pier, Puget Sound Pilots dock, Icicle Seafoods laydown area, and the Ediz Hook Boat Launch. The planned USCG Covered Moorings Project and the Proposed Action would contribute a small increase in visual clutter along the eastern section of Ediz Hook. However, the structures associated with the Proposed Action are compatible with the designated land uses in the project area. The Proposed Action would not substantially contribute to a significant adverse cumulative impact on visual resources.

4.11 Solid Waste and Hazardous Materials

Historical land uses and past actions described in Section 4.1 (*Land Use and Recreation*) and Section 4.2 (*Water Quality and Sediments*) have contributed to a significant adverse impact on solid waste and hazardous materials in Port Angeles Harbor. More recent changes in land use,

including a reduction in industrial and commercial land uses, in addition to past and ongoing cleanup actions are contributing to a beneficial cumulative impact. The City of Port Angeles and other entities (e.g., federal and state agencies, Lower Elwha Klallam Tribe) have implemented or identified a range of actions to reduce hazardous waste and pollution in Port Angeles Harbor (Table 4-1) (The Watershed Company 2012). While the Proposed Action would result in increased generation of solid and hazardous waste it would also contribute to a beneficial effect through the removal of the asbestos contaminated bulkhead at the end of the existing jetty under Alternative 2, or as mitigation for impacts under Alternative 1. The bulkhead, which is located on USCG property, has been in place since the 1970s. The Navy is not aware of any past, present, or future plans to remove the bulkhead aside from the Proposed Action. This asbestos removal, in addition to other recent past, ongoing, and future cleanup actions, would have a beneficial cumulative effect on hazardous materials and associated pollution in Port Angeles harbor.

4.12 Greenhouse Gas Emissions

There is broad consensus in the scientific community that human-generated emissions of greenhouse gases (GHGs), including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, have led to the cumulative effect of increasing global air temperatures during the past century (IPCC 2013). Studies have addressed the effects of increasing GHGs on water availability, ocean acidity, sea-level rise, ecosystems, energy production, agriculture and food security, and human health (USGCRP 2016, IPCC 2014). The CEQ has issued draft guidance describing how federal departments and agencies should consider the effects of greenhouse gas emissions and climate change in their NEPA reviews (CEQ 2014). The guidance emphasizes the relevance of the cumulative effect assessment to this topic and recommends providing a frame of reference. Accordingly, the Navy's *Final Environmental Impact Statement for TRIDENT Support Facilities: Explosives Handling Wharf* (EHW-2 FEIS; Navy 2012) is used as a basis for comparison with the Proposed Action and is incorporated by reference. The EHW-2 FEIS addressed a much larger dock and support facilities on Hood Canal involving construction techniques (e.g., pile driving) and design features (e.g., trestle and pile-supported wharf, floating wharf) comparable to the TPS Proposed Action.

The EHW-2 FEIS quantified construction-generated GHG emission estimates for five action alternatives on the basis of type and duration of equipment usage per construction activity, haul truck roundtrips for a specified distance, and support vessel activity for in-water work. The construction-related activities were pile driving, wharf construction, onshore trestle construction, new building construction required for facility relocations, and commuters. GHGs released into the atmosphere would include, but not be limited to, CO_2, CH_4, and N_2O. As a benchmark, the EHW-2 analysis adopted a GHG threshold of 25,000 metric tons or more of CO_2e[1] on an annual basis, which CEQ (2010) recommended as an indicator because it serves as a minimum standard for reporting GHG emissions under the Clean Air Act. The EHW-2 analyses of the five action alternatives found that total estimated emissions during construction over a 4-year period would range from 6,633 to 1,782 metric tons CO_2e, all substantially below the threshold of 25,000 metric tons or more of CO_2e annually (Navy 2012). For this reason, while acknowledging

[1] CO_2e is the carbon dioxide equivalent, a standard unit that expresses the impact of each different greenhouse gas in terms of the amount of CO_2 that would create the same amount of atmospheric warming.

their incremental contributions, the EHW-2 FEIS concluded that the alternatives for this large construction project would not substantially contribute to the U.S. GHG inventory and would produce less than significant impacts on climate change. In comparison to EHW-2, total GHG emissions generated during construction of TPS Alternative 1, 2, or 3 would be a small fraction of the total GHG emissions estimated for the much larger EHW-2 project and would contribute proportionately less to climate change.

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5.0 Other Considerations Required by NEPA

In accordance with 40 CFR Section 1502.16(c), analysis of environmental consequences shall include a discussion of possible conflicts between the Proposed Action and the objectives of federal, regional, state, and local land use plans, policies, and controls. Table 5-1 identifies the principal federal laws and regulations that are applicable to the Proposed Action, and describes briefly how compliance with these laws and regulations would be accomplished.

Table 5-1. Principal Federal Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
National Environmental Policy Act (NEPA); CEQ NEPA implementing regulations; Navy procedures for Implementing NEPA; and OPNAV M-5090.1, Chapter 10	Preparation of this EA was conducted in compliance with NEPA and in accordance with CEQ regulations and the Navy's NEPA procedures.
Clean Air Act	USCG AIRSTA/SFO Port Angeles is located in Clallam County, which is an attainment area for priority air pollutants; because of this, a formal conformity determination is not required. Emissions for the Proposed Action would come from temporary, mobile sources and would be well below applicable thresholds. As a result, the project would comply with the requirements of the Clean Air Act, as amended.
Endangered Species Act (ESA)	In accordance with ESA Section 7 requirements, the Navy prepared a Biological Assessment (BA) that concludes the Proposed Action is likely to adversely affect several federally listed species potentially present and designated critical habitats for Puget Sound Chinook and bull trout (see Appendix B). The Navy completed formal consultation with USFWS and NMFS regarding these potential effects. NMFS concurred with the Navy's not likely to adversely affect determinations, and prepared a Biological Opinion for species that the Proposed Action is likely to adversely affect (Appendix C). The Navy received a draft Biological Opinion from USFWS for species the Proposed Action is likely to adversely affect (bull trout and designated critical habit, and marbled murrelet).
Marine Mammal Protection Act (MMPA)	Concerning potential impacts on marine mammals, the Navy submitted an Incidental Harassment Authorization (IHA) Application to NMFS requesting take for Level B harassment. NMFS published the Draft IHA in the Federal Register for public review and will issue the IHA prior to construction. The Navy will comply with all IHA conditions.
Magnuson-Stevens Fishery Conservation and Management Act (MSA)	The Navy submitted an EFH Assessment that concluded the Proposed Action may adversely affect designated EFH. The Navy has completed its consultation with NMFS regarding these potential effects.
Migratory Bird Treaty Act (MBTA)	The Proposed Action is not likely to adversely affect migratory bird populations and would be in compliance with the MBTA.

Table 5-1. Principal Federal Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
Bald and Golden Eagle Protection Act	The Proposed Action would not take, possess, or transport bald or golden eagles, their nests or eggs, and would therefore be in compliance with the Bald and Golden Eagle Protection Act.
Clean Water Act (CWA) (Sections 311, 401, and 404)	Pursuant to CWA Section 311, the Navy will prepare the Facility Response Plan for AS/SFO Port Angeles. The Navy has applied for a permit under Section 404 of the CWA from the USACE and a Section 401 Water Quality Certification from Ecology.
Rivers and Harbors Act	The Navy has applied to the USACE for a permit under Section 10 of the Rivers and Harbors Act.
Coastal Zone Management Act (CZMA)	The Navy submitted to Ecology a CZMA Federal Consistency Determination that the Proposed Action would be consistent, to the maximum extent practicable, with the enforceable policies of the Washington State Coastal Zone Management Program. Per 15 CFR 930.41, the Navy presumed the Department of Ecology's concurrence with the Navy's Federal Consistency Determination for the Proposed Action.
National Historic Preservation Act (NHPA)	The Navy determined that the Proposed Action would have No Adverse Effect on properties eligible for inclusion in the NRHP, and received concurrence with this determination from the Washington State Department of Archaeology and Historic Preservation (Appendix C).
Consultation and Coordination with Indian Tribal Governments (EO 13175) and Department of the Navy Policy for Consultation with Federally Recognized Indian Tribes (SECNAV Instruction 11010.14A)	The Navy invited government-to-government consultation with the Lower Elwha Klallam Tribe, the Jamestown S'Klallam Tribe, and the Port Gamble S'Klallam Tribe regarding potential impacts on tribal treaty rights and traditional resources. A Memorandum of Agreement describing the agreed-upon treaty mitigation has been executed by the Navy and tribes.
EO 12088, Federal Compliance with Pollution Control Standards	EO 12088 requires federal facilities to comply with applicable pollution control standards. During construction and operation, BMPs and a Spill Prevention, Control, and Countermeasures Plan would be implemented to prevent erosion, contamination, leaks, and spills. Stormwater from the pier would be filtered prior to discharge; stormwater from upland facilities would be collected and infiltrated into the ground.
EO 12898, Federal Actions to Address Environmental Justice in Minority and Low-income Populations	No disproportionately high and adverse human health or environmental impacts on minority and low-income populations are expected from the Proposed Action.
EO 13045, Protection of Children from Environmental Health Risks and Safety Risks	There are no residences, schools, or other facilities used by children at USCG AIRSTA/SFO Port

Table 5-1. Principal Federal Laws Applicable to the Proposed Action

Federal, State, Local, and Regional Land Use Plans, Policies, and Controls	Status of Compliance
	Angeles, and access is restricted. The nearest residence is 1 mile away and the nearest school is 3 miles away. The Proposed Action would have no environmental health risks or safety risks that would disproportionately affect children.

5.1 Irreversible or Irretrievable Commitment of Natural or Depletable Resources (40 CFR Section 1502.16)

Irreversible commitments of resources are actions that result in the loss of resources that cannot be reversed. Irretrievable commitments of resources are actions that result in the loss of resources. Implementing any of the action alternatives would require a commitment of natural, physical, human, and financial resources. These resources would be committed to the Proposed Action on a long-term or permanent basis. The construction of the TPS pier and upland facilities would use non-renewable resources such as fossil fuel, human labor, and construction materials such as concrete, wood, steel, and aggregate material (gravel and asphalt). These resources are generally not retrievable; however, they are not in short supply. Construction and operation would require an expenditure of government funds that would not be retrievable. Commitment of these resources is based on the benefit that would be provided by securing the safety of transiting submarines and the crews that protect them.

5.2 Relationship between Local Short-Term Use of the Human Environment and Maintenance and Enhancement of Long-Term Natural Resource Productivity (40 CFR Section 1502.16)

Implementation of any of the Proposed Action involves trade-offs between short-term impacts on environmental resources and long-term gains in improved infrastructure for the TPS. Short-term impacts would generally occur during the construction period and include increased ambient and underwater noise, traffic, access issues, and visual clutter. Longer term impacts would include the loss of undeveloped area at USCG AIRSTA/SFO Port Angeles and underwater habitat, and ongoing shading of marine vegetation. However, the long-term benefits from the Proposed Action include meeting the USCG requirements for underway hour limits and improving the efficiency and capability of the USCG crews to meet the TPS mission and national security requirements.

5.3 Means to Mitigate and/or Monitor Adverse Environmental Impacts (40 CFR Section 1502.16(h))

A Mitigation Action Plan has been prepared for providing mitigation, including compensatory mitigation for the loss of aquatic resources (see Section 2.6 and Appendix A). Design measures, current practices, and BMPs for avoiding and minimizing impacts are described in Section 2.5.

5.4 Any Probable Adverse Environmental Effects that Cannot be Avoided and Are Not Amenable to Mitigation

Under Alternative 2, access to a recreational site (the rock pile) for scuba diving would be prevented by security restrictions.

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