3.17. IMPACT SUMMARY

This section summarizes and compares the environmental impacts of the action alternatives for each Proposed Action. The No Action Alternatives (Alternative 1 for each Proposed Action) would not have environmental impacts and are not addressed in this section.

3.17.1. LWI Alternatives

Table 3.17–1 summarizes the environmental impacts of LWI Alternatives 2 and 3. Alternative 3 is the Preferred Alternative, in part because it would have fewer environmental impacts than Alternative 2 and, therefore, it is also the environmentally Preferred Alternative and the Least Environmentally Damaging Practicable Alternative according to the CWA Section 404 (b)(1) guidelines. The principal reasons for Alternative 2's greater impacts are that it would have a larger number of piles (and thus greater noise impacts), in-water pile driving, greater habitat impacts, and greater potential to affect migration of juvenile salmonids than Alternative 3. Unlike Alternative 2, Alternative 3 would have two observations posts supported by piles in the upper intertidal zone, and would include the replacement of the existing observation post on Marginal Wharf. Upland impacts of the two alternatives would be the same, except that Alternative 2 would have greater adverse impacts on traffic and greater positive impacts on socioeconomics.

Construction of LWI Alternative 2 would include driving 120 in-water support piles for the permanent piers, 16 permanent piles for the dolphins (8 at each), and 120 in-water piles for the temporary construction trestle, which would generate underwater and airborne noise levels for up to 80 days. In comparison, construction of Alternative 3 would require no in-water pile driving, thus avoiding resulting underwater noise impacts to marine biota. For both alternatives, however, marine mammals (pinnipeds), marbled murrelets, and upland wildlife could be exposed to airborne noise from driving of the abutment piles. In addition to pile driving noise, construction impacts on the marine environment would include minor turbidity from pile driving (LWI Alternative 2 only), PSB mooring anchor removal and placement (both alternatives), and boat movement (both alternatives). For Alternative 2, pile driving noise could result in behavioral disturbance or injury of ESA-listed salmonids (Hood Canal summer-run chum salmon, Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout) or marbled murrelets occurring in the immediate project area, as well as behavioral disturbance of marine mammals. ESA-listed rockfish (bocaccio, yellow-eye rockfish, and canary rockfish) are not expected in the project area. Marine mammals potentially affected by behavioral harassment (Alternative 2 only) would include the following non-ESA-listed species: Steller sea lion, harbor seal, California sea lion, harbor porpoise, and transient killer whales. The ESA-listed humpback whale is not expected to be exposed to behavioral harassment due to the rare occurrence of this species in the project area. The ESA-listed Southern Resident killer whale is not present in the project area. Limiting pile driving and abutment work below MHHW to the in-water work season of July 15 to January 15 would minimize potential impacts on ESA-listed salmonids. Pile driving noise for Alternative 3 (airborne noise only) is not expected to result in behavioral disturbance of pinnipeds or marbled murrelets, and would have no measurable impacts on ESA-listed fish.

Construction of the shoreline abutments would be the same for both alternatives and would require temporary excavation of an area of approximately 15,600 square feet (1,449 square meters) below MHHW. The stair landings and observation post piles for Alternative 3 would lie below MHHW, with a total area of approximately 142 square feet (13.2 square meters).

Alternative 2 would not have observation posts, so the area below MHHW would be 24 square feet (2.2 square meters). For both LWI Alternatives 650 feet (198 meters) of temporary coffer dam would be installed to provide for excavation of the abutment wall and stair landings. Once the abutment foundations would be built the excavated area below MHHW would be backfilled and a 2-foot (0.6-meter) high by approximately 10-foot (3 meter) wide riprap berm (303 cubic yards [232 cubic meters]) would be placed above the natural beach contour. Placement of the steel plate anchors and piles for LWI Alternative 2 would result in the permanent loss of 1,040 square feet (97 square meters) of eelgrass habitat. Placement of PSB buoy mooring anchors and PSB and buoy grounding under LWI Alternative 3 would result in the permanent loss of 580 square feet (54 square meters) of eelgrass habitat. Under Alternative 3, the observation posts constructed adjacent to the new abutments would shade benthic habitat in the upper intertidal zone (total of 2,000 square feet [186 square meters]) but not marine vegetation or oyster beds[1]. Similarly, the dolphin platforms (Alternative 2 only) would shade benthic habitat (128 square feet [12 square meters]) but not marine vegetation or oysters. The presence of the pier and in-water mesh under Alternative 2 could represent at least a partial barrier to the migration of ESA-listed salmonids along the Bangor waterfront. In contrast, Alternative 3 would have less of a barrier effect on ESA-listed salmonids because it would lack the pier and in-water mesh. The guard panels between PSB pontoons would have negligible impacts on migration of ESA-listed salmonids.

Practices and measures to minimize impacts to ESA-listed species would be implemented as described in the Mitigation Action Plan (Appendix C). Construction and operation of LWI Alternatives 2 and 3 may affect, but is not likely to adversely affect, ESA-listed salmonids, rockfish, humpback whales, Southern Resident killer whales, and marbled murrelets. The Navy conducted Section 7 consultation to address potential impacts on federally listed species and designated critical habitat. NMFS provided its concurrence with the Navy's ***not likely to adversely affect*** determinations under informal consultation on November 13, 2015. NMFS also concurred with the Navy's ***may adversely affect*** determination for EFH for under the MSA. NMFS determined that no conservation recommendations were required because implementation of the Navy's best management practices and mitigation measures will be sufficient to avoid, mitigate, or offset the impacts of the Proposed Action on intertidal EFH. In a concurrence letter dated March 4, 2016, USFWS stated that LWI project impacts to bull trout are not measurable and therefore insignificant, and impacts to marbled murrelets are discountable. USFWS also did not request additional conservation measures beyond the Navy's BMPs and mitigation measures. The preferred alternative (Alternative 3) would not result in harassment of marine mammal as defined by the MMPA, so MMPA consultation is not required.

For Alternative 2, periodic cleaning of the mesh by power washing would result in minor water quality impacts, which would be minimized by employing appropriate BMPs. Likewise for both alternatives, periodic cleaning of the PSB guard panels would result in minor water quality impacts, which would be minimized by employing appropriate BMPs. Pursuant to the CWA, the Navy submitted a JARPA for permits from USACE for fill associated with the abutment stair landings and riprap, and for a Section 401 water quality certification from WDOE. In accordance with the CZMA, the Navy submitted a CCD to WDOE.

[1] The replacement observation post on Marginal Wharf would be constructed on the existing wharf and would not increase overwater shading.

Impacts of both alternatives on the upland environment would be similar and include approximately 1.1 acre (0.44 hectare) of vegetation clearing, construction traffic, air pollutant emissions, and pile driving and conventional construction noise. With the exception of 0.12 acre (0.048 hectare) of new impervious surface and 0.1 acre (0.039 hectare) of permanent pervious surfaces such as aggregate pathways, the disturbed area would be revegetated with native species. There would be no impacts on wetlands. Wildlife could be disturbed by construction noise and lighting, but no terrestrial animals or plants protected under the ESA would be affected. Potential impacts to bald eagles may occur as a result of elevated noise levels or visual disturbance during construction, but no incidental takes are anticipated.

Nearby residential areas and recreational users of the waters off NAVBASE Kitsap Bangor may experience elevated noise levels during construction, but no other impacts on land use or recreation are anticipated. Both alternatives would have minimal impacts on aesthetics; impacts would be greater for Alternative 2 than for Alternative 3, because of the larger structure and larger number of piles for Alternative 2. Both alternatives would be consistent with the NAVBASE Kitsap Bangor TRIDENT Support Site Master Plan. Temporary socioeconomic impacts of construction would be positive: for every $100 million spent by the Navy in construction expenditures, an estimated 919 direct jobs would be created, as well as an estimated 426 indirect and induced jobs. Indirect or induced jobs would be concentrated in the following industries: food services, real estate establishment, health care, architecture and engineering, wholesale trade, and retail stores. For Alternative 2, the construction cost is estimated to be approximately $54 million, representing a total economic impact of 500 direct jobs and 233 indirect and induced jobs. Total economic output to the region would be in excess of $80 million. For Alternative 3, the construction cost is estimated to be approximately $33 million, representing the total economic impact of 300 direct jobs and 139 indirect and induced jobs. Total economic output to the region would be in excess of $48 million. Long-term socioeconomic impacts would be minimal. Neither alternative would have disproportionately high and adverse human health or environmental effects on minority populations or low-income populations because the affected areas do not disproportionately contain minority or low-income populations. In addition, because the project is located within a military restricted area, there would be no potential for children to be exposed to pollutants, other hazardous materials, or safety hazards as a result of construction and operation of either LWI alternative.

The cultural setting of Delta Pier and EHW-1, which are eligible to be listed in the NRHP, would not be adversely affected. In July 2015 the SHPO concurred with the Navy's determination of no adverse effect of the LWI project on historic properties under the NHPA. There would be a small potential for disturbance of archaeological resources (prehistoric sites) during construction; if any such resources were encountered, the Navy would coordinate with the SHPO and the tribes. Access to tribal shellfish harvesting areas would be restricted in the construction area only during construction of the LWI. During operations access would not be restricted but the new structures would result in permanent loss of 1,880 square feet (175 square meters) of the shellfish harvesting areas under Alternatives 2 and 3 (Table 3.17–1). Neither alternative would have population-level effects on salmon stocks harvested by the tribes. Construction vessels could interfere with tribal fishing vessels operating in Hood Canal. The Navy invited and has conducted government-to-government consultation with the five federally recognized American

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Marine Water Resources	No change	• Temporary and localized disturbances to bottom sediment within the construction footprint, maximum 13.1 acres (5.3 hectares) • Temporary and localized changes to water quality (turbidity and suspended sediment concentrations) associated with resuspension of bottom sediments, but changes are not expected to exceed water quality standards • Localized scouring or accumulation of sediments, which would not result in measurable changes in overall sea bed elevations (i.e., deposition or erosion) or littoral transport processes • Release of organic matter from periodic cleaning of the LWI mesh and PSB guard panels	• Temporary and localized disturbances to bottom sediment within the construction footprint; maximum of 12.7 acres (5.2 hectares) • Temporary and localized changes to water quality (turbidity and suspended sediment concentrations) associated with resuspension of bottom sediments, but changes are not expected to exceed water quality standards • Localized disturbances of bottom sediments from grounding of PSB feet and buoys during low tidal stages • Release of organic matter from periodic cleaning of the PSB guard panels
Marine Vegetation and Invertebrates	No change	• Temporary shallow water construction impacts: approximately 6.3 acres (2.4 hectares), 3 acres (1.2 hectares) vegetated • Permanent loss of approximately 1,040 sq ft (97 sq m) of eelgrass habitat under steel plate anchors and piles • Long-term full shading from dolphin platforms of approximately 128 sq ft (12 sq m) of habitat (not vegetated) • Limited shading by pier grating not expected to have significant impacts on vegetation or invertebrates • Benthic habitat loss of approximately 5,952 sq ft (553 sq m) under piles, steel plate anchors, and abutment stair landings • Permanent loss of approximately 226 sq ft (95 sq m) of oyster beds under piles and steel plate anchors • Localized, negligible impacts on plankton	• Temporary shallow water construction impacts: approximately 5.9 acres (2.4 hectares), 2.8 acres (1.1 hectares) vegetated • Permanent loss of approximately 580 sq ft (54 sq m) of eelgrass habitat from anchor placement and PSB/buoy disturbance • Long-term full shading from observation posts of approximately 2,000 sq ft (186 sq m) of habitat (not vegetated) • Limited shading by PSBs and observation post stair grating not expected to have significant impacts on vegetation or invertebrates • Permanent loss of approximately 2,570 sq ft (239 sq m) of intertidal habitat due to grounding of PSBs and buoys • Permanent benthic habitat loss of approximately 142 sq ft (13 sq m) under observation post piles and abutment stair landings

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Marine Vegetation and Invertebrates (continued)		• Practices and measures applied to offset impacts on eelgrass and other marine habitat (measures for water quality, shading, vessel movements; compensatory mitigation implemented under the HCCC ILF program, see Appendix C, Mitigation Action Plan)	• Permanent loss of approximately 640 sq ft (52 sq m) of oyster beds due to grounding of PSBs/buoys • Localized, negligible impacts on plankton • Practices and measures applied to offset impacts on eelgrass and other marine habitat (measures for water quality, shading, vessel movements; compensatory mitigation implemented under the HCCC ILF program, see Appendix C, Mitigation Action Plan)
Threatened and Endangered Species	No change	• May affect, not likely to adversely affect, ESA-listed Puget Sound Chinook, Puget Sound steelhead, Hood Canal summer-run chum salmon, bull trout, bocaccio, canary rockfish, yelloweye rockfish, humpback whale, Southern Resident killer whale, and marbled murrelet • May affect, not likely to adversely affect critical habitat for Puget Sound Chinook, Hood Canal summer-run chum salmon, bocaccio, canary rockfish, and yelloweye rockfish • No effect on critical habitat for Puget Sound steelhead, bull trout, Southern Resident killer whale, and marbled murrelet • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise)	• May affect, not likely to adversely affect, ESA-listed Puget Sound Chinook, Puget Sound steelhead, Hood Canal summer-run chum salmon, bull trout, bocaccio, canary rockfish, yelloweye rockfish, humpback whale, Southern Resident killer whale, and marbled murrelet • May affect, not likely to adversely affect critical habitat for Puget Sound Chinook, Hood Canal summer-run chum salmon, bocaccio, canary rockfish, and yelloweye rockfish • No effect on critical habitat for Puget Sound steelhead, bull trout, Southern Resident killer whale, and marbled murrelet • Measures and practices to be implemented to offset impacts (measures proposed for airborne pile driving noise)

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Fish	No change	• Construction noise, including impact and vibratory pile driving noise (up to 80 days during first in-water work window) that may exceed current thresholds and guidelines for ESA-listed species behavior and injury • Temporary (24 months) and intermittent construction impacts including increased turbidity and reduction in aquatic vegetation and benthic habitats • Partial operational barrier effect, on nearshore-occurring migratory fish; minor loss of forage fish spawning habitat and supratidal fish habitat. • Measures and practices to be implemented to offset construction impacts (measures proposed for pile driving noise)	• Construction noise disturbance (no in-water pile driving) • Temporary (12 months) and intermittent construction impacts including increased turbidity and minor reduction in benthic habitats (less than Alternative 2) • Minimal barrier effect (less than Alternative 2) on nearshore-occurring juvenile and adult migratory fish; minor loss of forage fish spawning habitat and supratidal fish habitat. • Measures and practices to be implemented to offset construction impacts
Marine Mammals	No change	• Changes in prey availability due to loss or degradation of benthic habitat and operational barrier to migratory fish • Direct impacts due to pile driving noise sufficient to exceed NMFS disturbance thresholds • Estimated Level B (behavioral) incidental takes based on acoustic propagation model of pile driving noise: – Steller sea lion: 160 – CA sea lion: 2,880 – Harbor seal: 18,080 – Transient killer whale: 180 – Harbor porpoise: 320 • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise)	• Changes in prey availability due to minor loss / degradation of benthic habitat (less than Alternative 2) • No incidental takes from pile driving noise anticipated • Measures and practices to be implemented to offset impacts (measures proposed for airborne pile driving noise)

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Marine Birds	No change	• Changes in prey availability due to loss and degradation of benthic habitat and operational barrier to migratory fish • Impacts due to pile driving noise sufficient to exceed auditory injury and masking thresholds for marbled murrelets • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise) • No incidental takes of MBTA-protected birds anticipated	• Changes in prey availability due to minor loss / degradation of benthic habitat (less than Alternative 2) • Impacts due to airborne pile driving noise sufficient to exceed masking thresholds for marbled murrelets • Measures and practices to be implemented to offset impacts (measures proposed for airborne pile driving noise) • No incidental takes of MBTA-protected birds are anticipated
Terrestrial Biological Resources	No change	• Approximately 1.1 acre (0.44 hectare) of vegetation cleared • Revegetation of 0.86 acre (0.35 hectare) • Intermittent construction noise impacts on wildlife over 24 months • Potential disturbance of foraging bald eagles; no incidental takes under Bald and Golden Eagle Protection Act anticipated • Minor increases in visual disturbance to wildlife due to human activity, lighting, and vehicle movements • Increased isolation of terrestrial habitat within the Waterfront Security Enclave due to loss of shoreline connectivity to adjacent habitat • Measures and practices to be implemented to offset potential impacts	• Approximately 1.1 acre (0.44 hectare) of vegetation cleared • Revegetation of 0.86 acre (0.35 hectare) • Intermittent construction noise impacts on wildlife during 24 months • Potential disturbance of foraging bald eagles; no incidental takes under Bald and Golden Eagle Protection Act anticipated • Minor increases in visual disturbance to wildlife due to human activity, lighting, and vehicle movements • Increased isolation of terrestrial habitat within the Waterfront Security Enclave due to loss of shoreline connectivity to adjacent habitat • Measures and practices to be implemented to offset potential impacts
Geology, Soils, and Water Resources	No change	• Temporary disturbance of approximately 1.1 acres (0.44 hectares) • Approximately 5,186 sq ft (482 sq m) of new impervious surface • Permanent disturbance of shoreline geology and soils at abutment	• Temporary disturbance of approximately 1.1 acres (0.44 hectares) • Approximately 5,186 sq ft (482 sq m) of new impervious surface • Permanent disturbance of shoreline geology and soils at abutment

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Land Use and Recreation	No change	• Compatible with Navy Waterfront Functional Plan and TRIDENT Support Site Master Plan • Exposure to elevated noise in recreational areas from pile driving (up to 80 days) and other construction activities • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving during daylight only; Navy to request U.S. Coast Guard to issue a Notice to Mariners; Navy to notify public prior to construction	• Compatible with Navy Waterfront Functional Plan and TRIDENT Support Site Master Plan • Exposure to elevated noise in recreational areas from pile driving (up to 30 days) and other construction activities • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving during daylight only; Navy to request U.S. Coast Guard to issue a Notice to Mariners; Navy to notify public prior to construction
Airborne Acoustic Environment	No change	• Temporary / intermittent exposure to elevated noise levels in nearby residential / recreation areas • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving would occur in daylight hours only; Navy to notify public prior to construction	• Temporary / intermittent exposure to elevated noise levels in nearby residential / recreation areas (shorter duration than Alternative 2) • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving would occur in daylight hours only; Navy to notify public prior to construction
Aesthetics and Visual Quality	No change	• Temporary disturbance of existing visual landscape during construction • Minimal increase in industrial appearance, including lighting, of the waterfront over the long term	• Temporary disturbance of existing visual landscape during construction (moderately less than Alternative 2) • Minimal increase in industrial appearance of the waterfront over the long term (less impact than for Alternative 2 due to no pier structure)
Socioeconomics	No change	• Local beneficial economic impacts from construction activities • No impacts to commercial or recreational fishing • Potential long-term socioeconomic impact on tribes who would no longer have access to approximately 1,880 sq ft (175 sq m) of U&A shellfish beds (oysters and clams) for commercial harvest. Mitigation included in Memorandum of Agreement (MOA) between Navy and Skokomish Indian Tribe signed on March 3, 2016. The Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.	• Local beneficial economic impact from construction activities (less than Alternative 2) • No impacts to commercial or recreational fishing • Potential long-term socioeconomic impact on tribes who would no longer have access to approximately 1,880 sq ft (175 sq m) of U&A shellfish beds (oysters and clams) for commercial harvest. Mitigation included in Memorandum of Agreement (MOA) between Navy and Skokomish Indian Tribe signed on March 3, 2016. The Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Environmental Justice and Protection of Children	No change	• No disproportionate effects from construction or operations on minority disadvantaged populations or children	• No disproportionate effects from construction or operations on minority disadvantaged populations or children
Cultural Resources	No change	• Effect, not adverse, on Delta Pier and EHW-1 • Low potential for disturbance of archaeological or NAGPRA resources during construction • Consultation with SHPO completed. If resources found during construction, mitigation measures would be developed in consultation with SHPO and tribes; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.	• Effect, not adverse, on Delta Pier and EHW-1 • Low potential for disturbance of archaeological or NAGPRA resources during construction • Consultation with SHPO completed. If resources found during construction, mitigation measures would be developed in consultation with SHPO and tribes; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.
American Indian Traditional Resources	No change	• Restricted access to shellfish harvest area within the immediate construction zone during construction • Temporary (projected up to 7 years) loss of approximately 0.68 acre (0.28 hectare) of shellfish in tribal harvest area • Exposure to elevated noise levels and visual/integrity impacts during construction for tribal harvesters • Long-term (Operations) loss of approximately 1,880 sq ft (175 sq m) of shellfish beds • No population-level impacts on salmon stocks harvested by tribes • Interference with tribal fishing vessels by project construction vessels • Mitigation measures developed to offset impacts; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.	• Restricted access to shellfish harvest area within the immediate construction zone during construction • Temporary (projected up to 6 years) loss of approximately 0.64 acre (0.26 hectare) of shellfish in tribal harvest area • Exposure to elevated noise levels during construction for tribal harvesters • Long-term (Operations) loss of approximately 1,880 sq ft (175 sq m) of shellfish beds • No population-level impacts on salmon stocks harvested by tribes • Interference with tribal fishing vessels by project construction vessels • Mitigation measures developed to offset impacts; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.

Table 3.17–1. Summary of Environmental Impacts and Mitigation for LWI Alternatives (continued)

Resource Area	LWI Alternative 1: No Action	LWI Alternative 2: Pile-Supported Pier	LWI Alternative 3: PSB Modifications (Preferred)
Traffic	No change	• Increased vehicle traffic during construction (24 months), which would add to existing peak-hour delays at base gates • Increased marine vessel traffic during two in-water work seasons • Traffic delays due to increase in openings of Hood Canal Bridge during construction; barge trips scheduled to avoid commuting hours to maximum extent	• Increased vehicle traffic during construction (24 months), which would add to existing peak-hour delays at base gates • Minimal increased marine vessel traffic (less than Alternative 2) during one in-water work season • Minimal traffic delays (less than Alternative 2) due to increase in openings of Hood Canal Bridge during construction; barge trips scheduled to avoid commuting hours to maximum extent
Air Quality	No change	• Temporary construction emissions would not exceed threshold for major source (24 months). The project site is in an attainment area.	• Temporary construction emissions (less than Alternative 2) would not exceed threshold for major source (24 months). The project site is in an attainment area.

EHW-1 = Explosives Handling Wharf-1; ESA = Endangered Species Act; HCCC = Hood Canal Coordinating Council; ILF = In-Lieu Fee; MOA = Memorandum of Agreement; NAGPRA = Native American Graves Protection and Repatriation Act; NMFS = National Marine Fisheries Service; SHPO = State Historic Preservation Officer; sq ft = square feet; sq m = square meter; U&A = Usual and Accustomed; USACE = U.S. Army Corps of Engineers; USFWS = U.S. Fish and Wildlife Service

Indian tribes that have U&A areas in the vicinity of the project area: the Skokomish Indian Tribe, Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribe, and Suquamish Tribe. On March 3, 2016 the Navy and the Skokomish Indian Tribe completed a Memorandum of Agreement (MOA) to undertake treaty mitigation for the LWI project by contributing funding to support the Skokomish River Basin restoration, with the terms and conditions of the MOA to apply only after the Navy begins in-water construction. The Navy and the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe have conducted government-to-government consultation for the LWI project since 2008. Although the Navy and these Tribes were not able to reach formal agreement on treaty mitigation projects at the time of publication of this FEIS, the Navy carefully considered tribal concerns regarding the Proposed Actions and assessed the potential for significant impact to tribal rights and protected resources. Based on the Navy's assessment, the Navy offered to fund one or more of several proposed treaty mitigation projects.

Construction would generate truck traffic, but this traffic would be within the capacity of the base road system. However, construction traffic for both alternatives would exacerbate existing peak-hour delays at both gates to NAVBASE Kitsap Bangor and roads immediately outside the gates. Alternative 2 would have a greater impact than Alternative 3 on traffic crossing the Hood Canal Bridge because of the larger number of construction barges. Impacts on air quality would be not significant for either alternative because emissions would be well below regulatory thresholds.

Air quality in the vicinity of the LWI and SPE project sites, the upland project area, and the greater area of NAVBASE Kitsap Bangor, all of which are located in Kitsap County, is generally rated as good, which is the highest air quality rating. Kitsap County is presently in attainment for all NAAQS for criteria pollutants.

Table 3.17–2 identifies mitigation for impacts on aquatic habitat and Waters of the U.S.

Table 3.17–2. Mitigation for LWI Impacts on Aquatic Habitat and Waters of the U.S.

LWI Impact	LWI Alternative 2 Area	LWI Alternative 3 Area	LWI Anticipated Mitigation[1]
Habitat displaced by piles and/or anchors in shallow water (< 30 feet)	5,927 square feet (551 square meters)	118 square feet (11 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Over-water area (shading) in shallow water[2]	14,883 square feet (1,383 square meters)	5,070 square feet (471 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Eelgrass covered by steel plate anchors and piles	1,039 square feet (96 square meters)	N/A	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.

Table 3.17–2. Mitigation for LWI Impacts on Aquatic Habitat and Waters of the U.S. (continued)

LWI Impact	LWI Alternative 2 Area	LWI Alternative 3 Area	LWI Anticipated Mitigation[1]
Eelgrass covered by buoy mooring anchors or degraded by PSB and buoy grounding	N/A	580 square feet (54 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Fill in waters of the U.S. (shoreline abutment stair landings and riprap)	4,124 square feet (383 square meters)	4,124 square feet (383 square meters)	Mitigation for loss of aquatic resources[3] would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Excavation in waters of the U.S. (shoreline abutments and stairs)	15,600 square feet (1,449 square meters)	15,600 square feet (1,449 square meters)	Mitigation for loss of aquatic resources[3] would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation Rule.
Total[4]	30,483 square feet (2,832 square meters)	20,670 square feet (1,920 square meters)	

HCCC = Hood Canal Coordinating Council; ILF = In-Lieu Fee; N/A = not applicable; PSB = port security barrier; USACE = U.S. Army Corps of Engineers

1. Final mitigation requirements for the selected alternative would be determined through the CWA permitting process. Please see Appendix C, the Mitigation Action Plan, for a discussion of compensatory mitigation.
2. No full shading of eelgrass is expected from either alternative.
3. Impact is from excavation during construction of the abutments and concrete fill from the abutment stair landings.
4. Total is the sum of the overwater area plus the excavation for the abutments; the abutment stair landing fill areas are included in the excavation areas; all other items are included in the overwater shading area.

3.17.2. SPE Alternatives

Table 3.17–3 compares the environmental impacts of SPE Alternatives 2 and 3. SPE Alternative 2 is the Preferred Alternative, in part because it would have fewer environmental impacts than Alternative 3 and, therefore, it is also the environmentally Preferred Alternative. The longer pier under Alternative 3 would result in more pile driving (and associated noise) and habitat impacts. Both alternatives would have minimal effects on juvenile salmon migration and tribal fisheries resources, no effect on tribal shellfish harvest beds, and potential impacts on clam seed stock under piles. Upland impacts for both alternatives would be the same, although Alternative 3 would have greater impacts on traffic on the Hood Canal Bridge and socioeconomics (positive) because of the larger construction project that would be required for the longer pier extension.

The principal difference between SPE Alternatives 2 and 3 is the length of the pier extension: 540 feet (165 meters) under Alternative 2 and 975 feet (297 meters) under Alternative 3. The width of both alternative pier extensions would be 68 feet (21 meters). SPE Alternative 2 would include driving of fewer piles (total of 385) than Alternative 3 (total of 660) and would generate

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Marine Water Resources	No change	• Temporary and localized disturbances to bottom sediments within the construction footprint, maximum 3.9 acres (1.6 hectares) • Temporary and localized changes to water quality associated with resuspension of bottom sediments, but changes are not expected to exceed marine water quality standards • Very localized scouring or accumulation of sediments, from small-scale changes in flow patterns, resulting in minor changes in sediment texture; these changes are not expected to exceed sediment quality standards • Marginal changes in current velocities but no measurable changes in other than localized sea bed elevations (i.e., deposition or erosion) or littoral transport processes expected	• Larger potential construction footprint of 6.6 acres (2.7 hectares); otherwise same as Alternative 2 • Temporary and localized changes to water quality associated with resuspension of bottom sediments, but changes are not expected to exceed marine water quality standards • Very localized scouring or accumulation of sediments, from small-scale changes in flow patterns, resulting in minor changes in sediment texture; these changes are not expected to exceed sediment quality standards • Marginal changes in current velocities but no measurable changes in other than localized sea bed elevations (i.e., deposition or erosion) or littoral transport processes expected
Marine Vegetation and Invertebrates	No change	• Temporary construction impacts in approximately 3.9 acres; small areas (0.28 acre [0.11 hectare]) of marine vegetation disturbed • Benthic habitat loss of approximately 1,965 sq ft (183 sq m) under piles • Localized, negligible impacts on plankton • Practices and measures applied to offset impact on marine habitat (measures for water quality, shading, vessel movements; compensatory mitigation implemented under the HCCC ILF program, see Appendix C, Mitigation Action Plan)	• Temporary construction impacts in approximately 6.6 acres (2.7 hectares); small areas (0.28 acre [0.11 hectare]) of marine vegetation disturbed • Benthic habitat loss of approximately 1,876 sq ft (174 sq m) under piles • Localized, negligible impacts on plankton • Practices and measures applied to offset impact on marine habitat (measures for water quality, shading, vessel movements; compensatory mitigation implemented under the HCCC ILF program, see Appendix C, Mitigation Action Plan)

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Threatened and Endangered Species	No change	• May affect, not likely to adversely affect, ESA-listed Puget Sound Chinook, Puget Sound steelhead, Hood Canal summer-run chum salmon, bull trout, bocaccio, canary rockfish, yelloweye rockfish, humpback whale, Southern Resident killer whale, and marbled murrelet • May affect, not likely to adversely affect, critical habitat for Puget Sound Chinook, Hood Canal summer-run chum salmon, bocaccio, canary rockfish, and yelloweye rockfish • No effect on critical habitat for Puget Sound steelhead, bull trout, Southern Resident killer whale, and marbled murrelet • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise; others to be developed in consultation with NMFS and USFWS)	• May affect, not likely to adversely affect, ESA-listed Puget Sound Chinook, Puget Sound steelhead, Hood Canal summer-run chum salmon, bull trout, bocaccio, canary rockfish, yelloweye rockfish, humpback whale, Southern Resident killer whale, and marbled murrelet • May affect, not likely to adversely affect, critical habitat for Puget Sound Chinook, Hood Canal summer-run chum salmon, bocaccio, canary rockfish, and yelloweye rockfish • No effect on critical habitat for Puget Sound steelhead, bull trout, Southern Resident killer whale, and marbled murrelet • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise; others to be developed in consultation with NMFS and USFWS)

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Fish	No change	• Construction noise, including impact and vibratory pile driving noise (up to 161 days over two in-water work seasons) that may exceed current thresholds and guidelines for ESA-listed species behavior and injury • Temporary (24 months over two in-water work seasons) and intermittent construction impacts including increased turbidity, artificial lighting, reduction in aquatic vegetation and benthic habitats • Offshore overwater structure (44,000 sq ft [4,090 sq m]) with support piles and fender piles (approximately 385) with limited artificial lighting • Little to no barrier effect on smaller, nearshore-migrating juvenile salmonids and forage fish, or larger, offshore migratory fish • Potential impact to adjacent nearshore sand lance spawning habitat • Measures and practices to be implemented to offset construction impacts (measures proposed for pile driving noise; others to be developed on consultation with NMFS)	• Construction noise, including impact and vibratory pile driving noise (up to 205 days over two in-water work seasons) that may exceed current thresholds and guidelines for injury and behavioral disturbance of ESA-listed species • Temporary (24 months over two in-water work seasons) and intermittent construction impacts including increased turbidity, artificial lighting, reduction in aquatic vegetation and benthic habitats, greater than Alternative 2 • Offshore overwater structure (70,000 sq ft [6,500 sq m]) with support piles and fender piles (approximately 660), with limited artificial lighting • Little to no barrier effect on smaller, nearshore-migrating juvenile salmonids and forage fish, or larger, offshore migratory fish • Potential impact to adjacent nearshore sand lance spawning habitat • Measures and practices to be implemented to offset construction impacts (measures proposed for pile driving noise; others to be developed on consultation with NMFS)

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Marine Mammals	No change	• Potential changes in prey availability due to loss and degradation of benthic habitat • Direct impacts due to pile driving noise sufficient to exceed NMFS behavioral disturbance thresholds • Estimated Level B (behavioral) incidental takes based on acoustic propagation modeling of pile driving noise: – Steller sea lion: 322 – CA sea lion: 5,796 – Harbor seal: 49,625 – Transient killer whale: 180 – Harbor porpoise: 875 • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise; others to be developed in consultation with NMFS)	• Potential changes in prey availability due to loss and degradation of benthic habitat (greater than Alternative 2) • Direct impacts due to pile driving noise sufficient to exceed NMFS behavioral disturbance thresholds • Estimated Level B (behavioral) incidental takes based on acoustic propagation modeling of pile driving noise: – Steller sea lion: 410 – CA sea lion: 7,380 – Harbor seal: 30,535 – Transient killer whale: 180 – Harbor porpoise: 620 • Measures and practices to be implemented to offset impacts (measures proposed for pile driving noise; others to be developed in consultation with NMFS)
Marine Birds	No change	• Changes in prey availability due to minor loss and degradation of benthic habitat • Impacts due to pile driving noise sufficient to exceed auditory injury and masking thresholds for marbled murrelet • Measures and practices to be implemented to offset impacts to marbled murrelets, developed in consultation with USFWS • No incidental takes of MBTA-protected birds anticipated	• Changes in prey availability due to minor loss / degradation of benthic habitat (greater than Alternative 2) Impacts due to pile driving noise sufficient to exceed auditory injury and masking thresholds for marbled murrelet (longer duration than Alternative 2) • Measures and practices to be implemented to offset potential impacts to marbled murrelets, developed in consultation with USFWS • No incidental takes of MBTA-protected birds anticipated

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Terrestrial Biological Resources	No change	• Permanent loss of approximately 7 acres (2.8 hectares) of forest vegetation and wildlife habitat; temporary loss of approximately 4 acres (1.6 hectares) of vegetation and wildlife habitat; to be revegetated following construction • Intermittent construction noise impacts on wildlife over 24 months • Increased potential for visual disturbance to wildlife due to human activity, lighting, and vehicle movements • Potential disturbance of foraging bald eagles; no incidental takes under Bald and Golden Eagle Protection Act anticipated • Measures and practices to be implemented to offset potential impacts	• Similar to Alternative 2. Permanent loss of approximately 7 acres (2.8 hectares) of forest vegetation and wildlife habitat; temporary loss of 4 acres (1.6 hectares) of vegetation and wildlife habitat; to be revegetated following construction • Intermittent construction noise impacts on wildlife over 24 months • Increased potential for visual disturbance to wildlife due to human activity, lighting, and vehicle movements • Potential disturbance of foraging bald eagles; no incidental takes under Bald and Golden Eagle Protection Act anticipated • Measures and practices to be implemented to offset potential impacts
Geology, Soils, and Water Resources	No change	• Temporary disturbance of approximately 4 acres (1.6 hectares) • 7 acres (2.8 hectares) of new impervious surface	• Same as Alternative 2. Temporary disturbance of approximately 4 acres (1.6 hectares) • 7 acres (2.8 hectare) of new impervious surface
Land Use and Recreation	No change	• Compatible with Navy Waterfront Functional Plan and TRIDENT Support Site Master Plan • Exposure to elevated noise in residential and recreational areas from pile driving (maximum 161 days over two in-water work seasons) and other construction noise • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving during daylight only; Navy to request U.S. Coast Guard to issue a Notice to Mariners; Navy to notify public prior to construction	• Compatible with Navy Waterfront Functional Plan and TRIDENT Support Site Master Plan • Exposure to elevated noise in residential and recreational areas from pile driving (maximum 205 days over two in-water work seasons) and other construction noise • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving during daylight only; Navy to request U.S. Coast Guard to issue a Notice to Mariners; Navy to notify public prior to construction
Airborne Acoustic Environment	No change	• Temporary / intermittent exposure to elevated noise levels in nearby residential / recreation areas • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving would occur in daylight hours only; Navy to notify public prior to construction	• Temporary / intermittent exposure to elevated noise levels in nearby residential / recreation areas (longer than Alternative 2) • Construction would not be conducted between 10 p.m. and 7 a.m.; pile driving would occur in daylight hours only

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
Aesthetics and Visual Quality	No change	• Temporary disturbance of existing visual landscape during construction • Minimal increase in industrial appearance (including lighting) of the waterfront over the long term • Minimal impact to the view from the most western point of Olympic View when viewing north (buffered by distance and landscape)	• Temporary disturbance of existing visual landscape during construction • Minimal increase in industrial appearance (including lighting) of the waterfront over the long term (greater impact than for Alternative 2 due to longer SPE structure and additional lighting fixtures) • Minimal impact (but slightly greater than Alternative 2) to the view from the most western point of Olympic View when viewing north (buffered by distance and landscape)
Socioeconomics	No change	• Local beneficial economic impacts totaling $131 million from construction activities • No impacts to commercial or recreational fishing • MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe	• Local beneficial economic impacts totaling $171 million from construction activities • No impacts to commercial or recreational fishing • MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe
Environmental Justice and Protection of Children	No change	• No disproportionate effects from construction or operations on minority disadvantaged populations or children	• No disproportionate effects from construction or operations on minority disadvantaged populations or children
Cultural Resources	No change	• No Impact; low potential for disturbance of archaeological deposits or NAGPRA items • Consultation with SHPO completed. If resources found during construction, mitigation measures would be developed in consultation with SHPO and tribes; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.	• No Impact; low potential for disturbance of archaeological deposits or NAGPRA items • Consultation with SHPO completed. If resources found during construction, mitigation measures would be developed in consultation with SHPO and tribes; MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe.
American Indian Traditional Resources	No change	• Minimal construction (short-term) impact on salmon with no resulting impact on tribal salmon harvest; no long-term impact • Interference with tribal fishing vessels from construction and operational Navy vessel traffic	• Minimal construction (short-term) impact on salmon with no resulting impact on tribal salmon harvest; no long-term impact • Interference with tribal fishing vessels from construction and operational Navy vessel traffic

Table 3.17–3. Summary of Environmental Impacts and Mitigation for SPE Alternatives (continued)

Resource Area	SPE Alternative 1: No Action	SPE Alternative 2: Short Pier (Preferred)	SPE Alternative 3: Long Pier
		• No impact on tribal shellfish harvest areas, but potential impacts on clam seed stock under piles • MOA signed with Skokomish Indian Tribe; the Navy will continue to consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe. • Practices and measures developed in consultation with federally recognized American Indian tribes to offset minimal impacts	• No impact on tribal shellfish harvest areas, but potential impacts on clam seed stock under piles • MOA signed with Skokomish Indian Tribe; the Navy will continue consult with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe. • Practices and measures developed in consultation with federally recognized American Indian tribes to offset minimal impacts
Traffic		• Construction traffic would add to existing peak-hour delays at both base gates • Increased marine vessel traffic during two in-water work seasons • During in-water construction, six barge round trips per month and 12 associated bridge openings would result in traffic delays on SR 104 (30 minutes on average per opening for a total of 6 hours per month); barge trips would be scheduled to avoid commuting hours to maximum extent possible • Over long term, two additional openings of Hood Canal Bridge per month	• Construction traffic would add to existing peak-hour delays at both base gates (longer construction period than Alternative 2) • Increased marine vessel traffic during two in-water work seasons (longer period than Alternative 2) • During in-water construction, six barge round trips per month and 12 associated bridge openings would result in traffic delays on SR 104 (30 minutes on average per opening for a total of 6 hours per month) over a longer period than Alternative 2; barge trips would be scheduled to avoid commuting hours to maximum extent possible • Over long term, two additional openings of Hood Canal Bridge per month
Air Quality	No change	• Temporary construction emissions would not exceed threshold for major source. The project site is in an attainment area. • Negligible increase of emissions from operations from the new facilities	• Temporary construction emissions would not exceed threshold for major source. The project site is in an attainment area. • Negligible increase of emissions from operations from the new facilities

ESA = Endangered Species Act; HCCC = Hood Canal Coordinating Council; ILF = In-Lieu Fee; MOA = Memorandum of Agreement; NAGPRA = Native American Graves Protection and Repatriation Act; NMFS = National Marine Fisheries Service; SHPO = State Historic Preservation Officer; sq ft = square feet; sq m = square meter; USFWS = U.S. Fish and Wildlife Service

pile driving noise over a shorter period. Alternative 2 would require up to 125 days of steel pile driving during the first in-water work window, and 36 days of concrete fender pile driving during the second, compared to Alternative 3's maximum of 155 days of steel pile driving during the first in-water work window, and 50 days of concrete pile driving during the second.

Pile driving noise could potentially result in behavioral disturbance or injury of marbled murrelets and ESA-listed salmon (Hood Canal summer-run chum salmon, Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout. ESA-listed rockfish (bocaccio, yellow-eye rockfish, and canary rockfish) are not expected in the project area. Behavioral disturbance of marine mammals is also possible. Marine mammals potentially affected by behavioral harassment would include the Steller sea lion, harbor seal, California sea lion, harbor porpoise, and transient killer whales. These effects would occur over a shorter period for SPE Alternative 2 than for Alternative 3. The ESA-listed humpback whale is not expected to be exposed to behavioral harassment due to its rare occurrence in the project area. The ESA-listed Southern Resident killer whale is not present in the project area. Limiting pile driving to the established in-water work season (July 15 to January 15) would minimize the potential for impacts on ESA-listed fish.

The new overwater coverage created would be less under SPE Alternative 2 (44,000 square feet [4,090 square meters]) than Alternative 3 (70,000 square feet [6,500 square meters]), resulting in less shading of the benthic community. Under both alternatives, new pier structures would lie in water depths greater than 30 feet (9 meters), resulting in no shading of eelgrass or macroalgae habitat and minimal effects on salmon migration.

Practices and measures to minimize impacts to ESA-listed species would be implemented as described in the Mitigation Action Plan (Appendix C). Construction and operation of SPE Alternatives 2 and 3 may affect, but is not likely to adversely affect, ESA-listed salmonids and rockfish, humpback whales, Southern Resident killer whales, and marbled murrelets. The Navy is in ESA Section 7 consultation with the NMFS West Coast Region office. In a concurrence letter dated March 4, 2016, USFWS stated that SPE project impacts to bull trout are not measurable and therefore insignificant, and impacts to marbled murrelets are discountable. Consultations are also ongoing with the NMFS West Coast Region office under the MSA, and with the NMFS HQ Office for MMPA compliance. The Navy has submitted an IHA application for the first year of construction of the SPE and will prepare and submit an additional MMPA authorization application for the second year of construction.

Upland features of SPE Alternatives 2 and 3 would be the same, resulting in the same impacts. Construction of new project elements would result in permanent loss of 7 acres (2.8 hectares) of forest vegetation and wildlife habitat (Figures 2-9 and 3.5-3). An additional 4 acres (1.6 hectares) of vegetation would be disturbed temporarily during construction, but revegetated with native species following construction. There would be no impacts on wetlands. Wildlife would be disturbed by pile driving noise for a shorter period under Alternative 2 than under Alternative 3. Four trees potentially suitable for nesting by marbled murrelets may be removed under both alternatives. No other terrestrial animals or plants protected under the ESA would be affected. Wildlife could be disturbed by construction noise and lighting, but no terrestrial animals or plants protected under the ESA would be affected. Potential impacts to foraging bald

eagles may occur as a result of elevated noise levels or visual disturbance during construction, but no incidental takes are anticipated.

When the SPE project is programmed and scheduled, the Navy will submit a CCD to WDOE and an application for permits under the CWA and Rivers and Harbors Act for the SPE project to USACE and WDOE.

Nearby residential areas and recreational users of the waters off NAVBASE Kitsap Bangor may experience elevated noise levels during construction, but no other impacts on land use or recreation are anticipated. SPE Alternative 2 would result in a shorter duration of construction, and would have somewhat less potential lighting impacts on residential areas, than SPE Alternative 3. Aesthetic impacts would be slightly greater under SPE Alternative 3, but minimal under both alternatives. Both alternatives would be consistent with the NAVBASE Kitsap Bangor TRIDENT Support Site Master Plan. Positive socioeconomic impacts would be greater for SPE Alternative 3. The construction cost for SPE Alternative 2 is estimated to be approximately $89 million, representing the total economic impact of 818 direct jobs and 380 indirect and induced jobs. Total economic output to the region would be in excess of $131 million. The construction cost for SPE Alternative 3 is estimated to be approximately $116 million, representing the total economic impact of 1,066 direct jobs and 494 indirect and induced jobs. Total economic output to the region would be in excess of $170 million. Neither alternative would have disproportionate adverse effects on minority or disadvantaged populations.

In October 2015, the SHPO concurred with the Navy's determination of no adverse effect of the SPE project on historic properties under the NHPA. There would be a small potential for disturbance of archaeological resources (prehistoric sites) during construction; if any such resources were encountered, the Navy would coordinate with the SHPO and the tribes. Neither alternative would affect tribal fishing access at NAVBASE Kitsap Bangor, nor have a population-level effect on salmon stocks harvested by the tribes. Construction vessels and operational transits of submarines could interfere with tribal fishing vessels in Hood Canal. The Navy invited and has conducted government-to-government consultation with the five federally recognized American Indian tribes that have U&A areas in the vicinity of the project area: the Skokomish, Port Gamble S'Klallam, Jamestown S'Klallam, Lower Elwha Klallam, and Suquamish Tribes. On March 3, 2016 the Navy and Skokomish Indian Tribe completed a Memorandum of Agreement (MOA) to undertake treaty mitigation projects for the SPE project by contributing funding to support the Skokomish River Basin restoration, with the terms and conditions of the MOA to apply only after the Navy begins in-water construction. The Navy began government-to-government consultation with the Port Gamble S'Klallam Tribe, Jamestown S'Klallam Tribe, and Lower Elwha Klallam Tribe for the SPE project in 2012. Although the Navy and these Tribes were not able to reach formal agreement on treaty mitigation projects at the time of publication of this FEIS, the Navy carefully considered tribal concerns regarding the Proposed Actions and assessed the potential for significant impact to tribal rights and protected resources. Based on the Navy's assessment, the Navy offered to fund one or more of several proposed treaty mitigation projects.

Construction traffic would exacerbate existing peak-hour delays at both gates to NAVBASE Kitsap Bangor and on roads immediately outside the gates; construction traffic impacts would

persist longer for Alternative 3 than Alternative 2. On-base construction traffic impacts would be minimal. During construction, both alternatives would increase the frequency of openings of the Hood Canal Bridge, an adverse impact on travelers on SR-104; this impact would last longer for Alternative 3 than for Alternative 2. Over the long term, there would be an estimated two additional openings of the Hood Canal Bridge per month under either action alternative. Impacts on air quality would be minimal because emissions would be well below regulatory thresholds. Air quality in the vicinity of the LWI and SPE project sites, the upland project area, and the greater area of NAVBASE Kitsap Bangor, all of which are located in Kitsap County, is generally rated as good, which is the highest air quality rating. Kitsap County is presently in attainment for all NAAQS for criteria pollutants.

Table 3.17–4 identifies mitigation of impacts on aquatic habitat and Waters of the U.S. that would be required by a permit issued for the project by USACE.

Table 3.17–4. Mitigation for SPE Impacts on Aquatic Habitat and Waters of the U.S.

SPE Impact	SPE Alternative 2 Area	SPE Alternative 3 Area	SPE Anticipated Mitigation[1]
Habitat displaced by piles in deep water (> 30 feet)	1,965 square feet (183 square meters)	1,876 square feet (174 square meters)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation for Losses of Aquatic Resources, Final Rule.
Overwater area (full shading) in deep water (more than 30 feet (9 meters) below MLLW). There would be no shading shallower than 30 feet below MLLW.	1.0 acre (0.41 hectare)	1.6 acres (0.65 hectare)	Mitigation for loss of aquatic resources would be provided by the Navy's participation in the HCCC ILF program for Hood Canal in accordance with the Compensatory Mitigation for Losses of Aquatic Resources, Final Rule.

MLLW = mean lower low water; USACE = U.S. Army Corps of Engineers

1. Final mitigation requirements for the selected alternative would be determined through the Clean Water Act permitting process. Habitat displaced by piles is included in the habitat in the overwater area. Project would not shade or displace shallow habitat. Please see Appendix C, the Mitigation Action Plan, for a discussion of compensatory mitigation.