# DRAFT ENVIRONMENTAL ASSESSMENT AND CLEAN WATER ACT SECTION 404 PUBLIC INTEREST REVIEW

## Keystone Harbor Maintenance Dredging and Disposal
## Fiscal Year 2020 through FY 2035[1]
## Admiralty Bay, Island County, Washington

**February 2020**

US Army Corps of Engineers®
Seattle District

[1] FY (fiscal years) span from 1 October to 30 September. This document covers dredging events from 16 July 2020 to 15 February 2035 (these dates are associated with the in-water work window)

# Keystone Harbor Maintenance Dredging and Disposal FY 2020 to FY 2035 Draft Environmental Assessment and Clean Water Act Section 404 Public Interest Review
# February 2020

**Responsible Agency:** The responsible agency for this navigation project is the U.S. Army Corps of Engineers, Seattle District (USACE).

**Abstract:**
In accordance with the National Environmental Policy Act (NEPA), this Environmental Assessment (EA) evaluates the impacts of the proposed maintenance dredging of the Keystone Harbor Navigation Project during fiscal years (FY) 2020 to FY 2035. In accordance with Section 404 of the Clean Water Act, this integrated document also evaluates whether it is in the public interest to undertake the Federal action. Keystone Harbor is located on the west side of Whidbey Island, in Island County, Washington. This artificial harbor is a dredged basin constructed by USACE in 1947-48 and is connected to Admiralty Bay by a Federal navigation channel. The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. Construction of the basin, entrance channel, and adjacent rock jetty interrupted the natural eastward transport of beach material. Consequently, shoaling of the entrance channel requires maintenance dredging every four to six years to ensure safe navigation. Maintenance dredging last occurred in 2011.

The recommended plan consists of maintenance dredging of up to 165,000 cubic yards of material over a 15-year period. All work would occur within the approved in-water construction window 16 July to 15 February by mechanical or hydraulic dredge. All the dredged sand and gravel shall be used beneficially to nourish a section of the beach to the east of the breakwater. Sediment test results are pending and should be complete upon the finalization of the EA. USACE expects all material to meet the Dredge Materials Management Programs (DMMP) criteria for open-water disposal and beneficial use based on previous sampling results and the grain size of the material. Based on the analysis in the EA, the proposed project would not constitute a major Federal action significantly affecting the quality of the human environment, thus preparation of an environmental impact statement is not required.

This document is available online at http://www.nws.usace.army.mil/ers/index.cfm under "Keystone Harbor Maintenance Dredging".

Please send questions and requests for additional information to:

Ms. Chemine Jackels
Environmental & Cultural Resources Branch
U.S. Army Corps of Engineers
P.O. Box 3755
Seattle, Washington 98124-3755
Chemine.r.jackels@usace.army.mil
206-764-3646

## TABLE OF CONTENTS

**List of Figures**



**List of Tables**



**List of Appendices**

## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BA | Biological Assessment |
| BiOp | Biological Opinion |
| CAA | Clean Air Act |
| cy | cubic yards |
| CWA | Clean Water Act |
| DMMO | Corps of Engineers Dredged Material Management Office |
| DMMP | Dredged Material Management Program |
| DNR | Washington State Department of Natural Resources |
| DO | dissolved oxygen |
| EA | Environmental Assessment |
| EFH | Essential Fish Habitat |
| EIS | Environmental Impact Statement |
| EPA | U.S. Environmental Protection Agency |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| FY | Fiscal Year |
| GHG | Green House Gas |
| MHHW | Mean Higher High Water |
| MLLW | Mean Lower Low Water |
| NMFS | National Marine Fisheries Service |
| PN | Public Notice |
| PSDDA | Puget Sound Dredge Disposal Analysis |
| SSD | Sediment Suitability Determination |
| USFWS | U.S. Fish and Wildlife Service |
| USACE | U.S. Army Corps of Engineers, Seattle District |
| USGS | U.S. Geological Survey |
| WDOE | Washington State Department of Ecology |

# 1 PROPOSAL FOR FEDERAL ACTION

The Council on Environmental Quality (CEQ) regulations, 40 CFR § 1500.1(c) and 40 CFR § 1508.9(a)(1), interpreting the National Environmental Policy Act of 1969 (as amended) (NEPA) require Federal agencies to "provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact" on actions authorized, funded, or carried out by the Federal government to ensure such actions adequately address "environmental consequences, and take actions that protect, restore, and enhance the environment." This Environmental Assessment (EA) evaluates the environmental effects of proposed maintenance dredging of the Keystone Harbor Navigation Project.

## 1.1 Location of the Proposed Action

### 1.1.1 Keystone Harbor

Keystone Harbor is located in northern Puget Sound on the west side of Whidbey Island in Island County, Washington (T31N, R1E, Sections 22, 23, and 24). Keystone Harbor is the eastern terminal of the Port Townsend/Coupeville ferry route (Figure 1). The navigation channel connects Admiralty Inlet to the Washington State Ferry terminal (Figure 2). The Harbor is surrounded by Ebey's Landing National Historic Reserve and by Fort Casey State Park. Lake Crockett lies to the northeast across State Route 20, and is connected hydraulically to the harbor through a culvert with a tidegate.

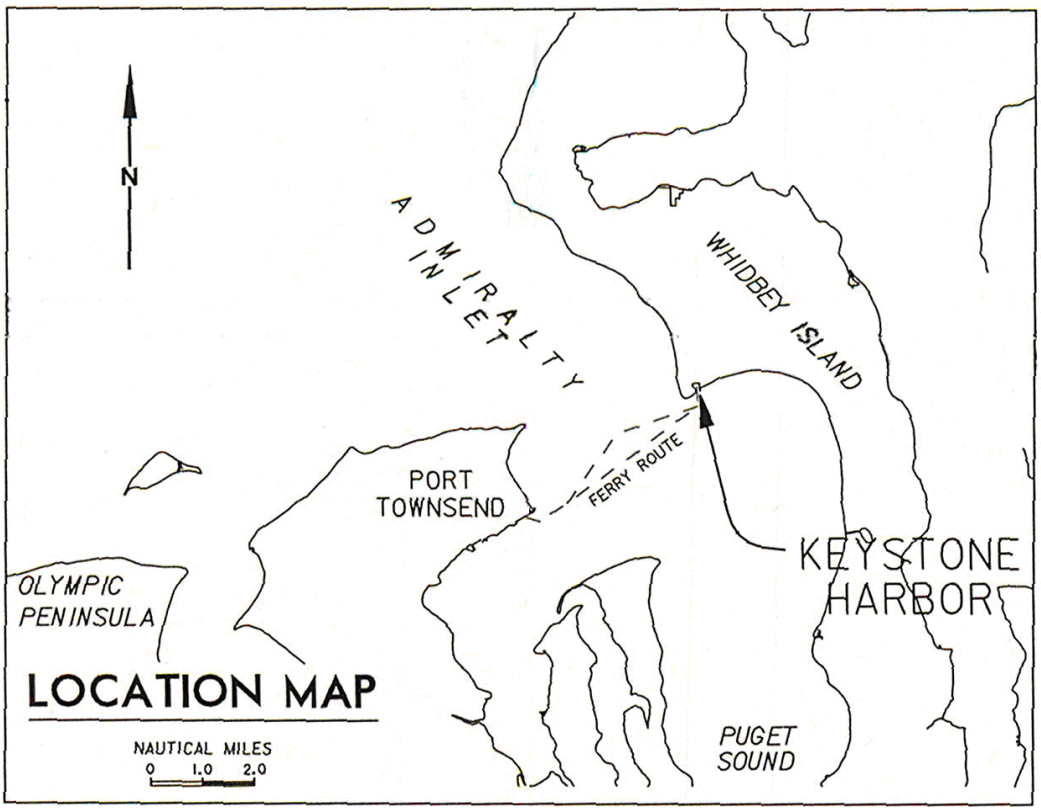


**Figure 1. Project location.**

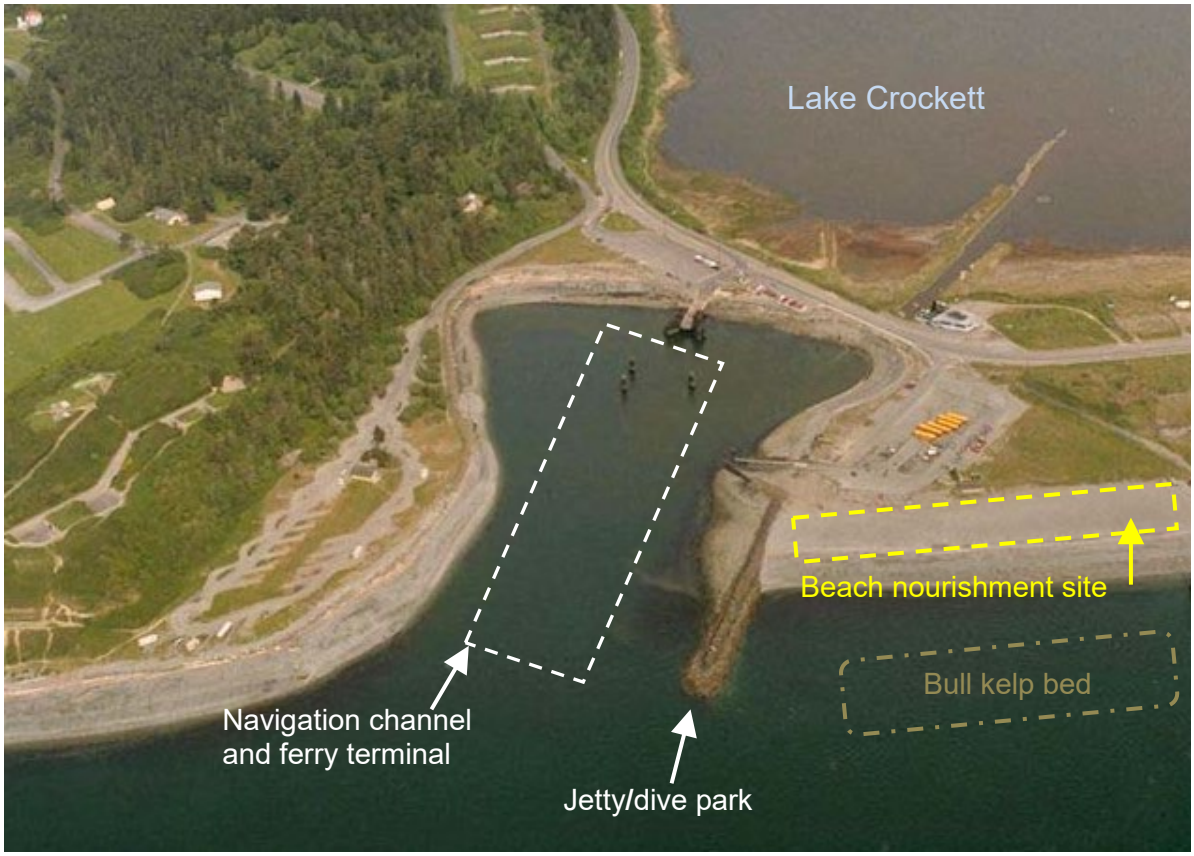


**Figure 2. Aerial photograph of Keystone Harbor taken 5 May 1993 (photo courtesy of the Washington Department of Ecology).**

### 1.1.2 Ebey's Landing National Historical Reserve

The Federal navigation channel and dredged material disposal site are located within the boundaries of the Ebey's Landing National Historical Reserve (NHR), which was created by Congress in 1978 as a unit of the National Park System (Pub. L. 95-625, title V, Sec. 508, Nov. 10, 1978, 92 Stat. 3507, as amended Pub. L. 96-87, title IV, Sec. 401(k), Oct. 12, 1979, 93 Stat. 666). The purpose of the national park system is "to conserve the scenery and the natural and historic objects and the wild life" in the parks and to "leave them unimpaired for the enjoyment of future generations" (16 U.S.C. § 1). Ebey's Landing NHR is managed by the National Park Service (NPS) in partnership with a nine-member Trust Board composed of representatives of Island County, the Town of Coupeville, the NPS, and the Washington State Parks and Recreation Commission. The purpose of Ebey's Landing NHR is to preserve and protect a rural community that provides an unbroken historical record from nineteenth century exploration and settlement in Puget Sound to present time.

### 1.1.3 Fort Casey State Park

Fort Casey State Park is a 467-acre marine camping park with a lighthouse and sweeping views of Admiralty Inlet and the Strait of Juan de Fuca. A coast artillery post features two historic guns on display. The park features 10,810 feet of saltwater shoreline on Puget Sound (Admiralty Inlet), and includes Keystone Spit, a two-mile-plus stretch of land separating Admiralty Inlet and Lake Crocket. An underwater park for SCUBA diving is located within the State Park, immediately east of the jetty.

## 1.2 Authority

The Keystone Harbor Project is authorized by several acts that together created the current authorized project scope. The Department of the Army Lake Crockett navigation project and maintenance dredging was authorized by Section 2 of the River and Harbor Act 1945 (March 2, 1945), Public Law 79-14. In 1971, the project was widened under authority of Section 107 of the River and Harbor Act of 1960 (July 14, 1960), Public Law 86-645. In 1993, the project was deepened by authority of Section 107 of the River and Harbor Act of 1960 (July 14, 1960), Public Law 86-645, as amended by Section 915 of the Water Resources Development Act of 1986 (November 17, 1986) Public Law 99-662.

This artificial harbor is a dredged basin originally constructed by the U.S. Army Corps of Engineers (USACE) in 1947-48 and modified in 1971 and 1993. USACE constructed the harbor by dredging a triangular shaped bay from an existing barrier beach, and connected the harbor to Admiralty Bay with a navigation channel. USACE built a stone breakwater (jetty) on the eastern side of the harbor. The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. The channel is designed to be 1,800 feet long, 200 feet wide, and 25 feet below Mean Lower Low Water (MLLW), herein notated as -25 MLLW, with authorized overdepth of 2 more feet below MLLW. This allows safe navigation for the ferries to dock during tides as low as -4.5 MLLW .

## *1.3 Project Purpose and Need*

The purpose of this project is to provide necessary safe navigation conditions for the Washington State Ferry System vessels to dock at Keystone Harbor for uninterrupted service on the Port Townsend/Coupeville ferry route. When the channel and ferry slip become too shallow, the ferry must cancel sailings, and the ferry has run aground during landings at low tide. This limits service on the Port Townsend/Coupeville run. Another purpose of the project is to prevent erosion of the beach to the point of undermining the jetty and losing park infrastructure due to the hindrance of sediment transport and delivery caused by the navigation features.

### 1.3.1 Navigation Conditions

Strong cross-currents, narrow channel width, and wind-generated waves combine to make Keystone Harbor the most difficult of all Washington State ferry terminals to enter. Vessel operators typically bring a ferry into the channel at full speed and, after the stern of the vessel is out of the influence of the cross current, apply full reverse to begin the docking maneuver. At low tide, there is insufficient water under the hull of a 13.5-foot-draft ferry to maintain vessel control. Propeller cavitation can occur with resulting loss of thrust and rudder “bite,” and the vessel may drift and run aground. Propeller clearance requires at least 7 feet for vessel control. With continued shoaling of the channel, the risk of ferry vessel groundings at moderate and lower tides increases dramatically. In addition, continued shoaling could limit the ability of Keystone Harbor to serve as a harbor of refuge.

### 1.3.2 Beach Erosion

The navigation project interrupts the natural littoral drift process. This results in gradual erosion of the harbor features and related recreation facilities. Continued erosion risks undermining the east jetty, an essential feature of the Federal navigation project. Over several years, severe erosion can occur on the adjacent beach to the east and can undermine the Washington State Park’s restroom facilities, picnic areas, parking lot, and recreational boat launch (Figure 3).

**Figure 3. Shoreline erosion along the adjacent beach.**

## 1.4 Pertinent Documents

Dredging practices and placement/disposal options in the project area were evaluated in the following documents:

- Fiscal Year 1976 Lake Crockett – Keystone Harbor Environmental Assessment for Maintenance Dredging
- Fiscal Year 1987 Supplemental Environmental Assessment for Maintenance Dredging
- Puget Sound Dredged Disposal Analysis (PSDDA). 1989. Final Environmental Impact Statement Unconfined Open-Water Disposal for Dredged Material, Phase 2. (North and South Puget Sound). September 1989, 585 pages
- Keystone Harbor Channel Deepening, Admiralty Inlet, Washington. Final Definite Project Report and Final Environmental Assessment 1991
- Fiscal Year 1992 Supplemental Environmental Assessment for Maintenance Dredging
- Fiscal Year 1998, 2006, and 2011 Environmental Assessment and Finding of No Significant Impact for Maintenance Dredging
- Biological Assessment: Fiscal Year 2017 through 2042 Maintenance Dredging of Selected Federal Authorized Navigation Channels, with Disposal of Dredged Material at Designated Disposal Sites, dated December 2016
- Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion (BiOp) and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the

Maintenance Dredging Program for Eight Federally-Authorized Navigation Channels Puget Sound and along the West Coast of Washington State (NMFS 2018)

- Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation and Fish and Wildlife Coordination Act Recommendations for the Continued Use of Multi-User Dredged Material Disposal Sites in Puget Sound and Grays Harbor, (Fourth Field HUCs 17110020 Dungeness-Elwha, 17110002 Strait of Georgia, 1711019 Puget Sound, and 17100105 Grays Harbor), Washington. (NMFS 2015).
- Determination Regarding the Suitability of Proposed Dredged Material from Keystone Harbor Navigation Project (CENWS-OD-TS-24) Whidbey Island, Washington, for Unconfined Open-water Disposal at a DMMP Disposal Site or Beneficial Re-Use (USACE 2011).

Copies of these documents are on file at the USACE Seattle District office.

# 2 PROPOSED ACTION AND ALTERNATIVES

Three alternatives were considered for maintenance dredging of the Keystone Harbor: (1) no action; (2) clamshell or hydraulic dredging with beach nourishment; and (3) clamshell dredging with open-water disposal. USACE used three primary criteria to evaluate each alternative. The first was whether an alternative met the purpose and need. The second was the effect an alternative would have on the environment, and third was the cost of each alternative. Alternative 1 does not meet the project purpose and Alternative 3 does not address the beach erosion down-drift of the navigation channel and is too costly; therefore, Alternative 2 was selected as the preferred alternative. Alternative 2 would restore the project to congressionally authorized depths, ensuring that safe navigation could continue. Additionally, the placement of materials along the adjacent beach would prevent erosion and deter the eventual undermining of the jetty.

## 2.1 Alternative 1 – No Action

The No-Action Alternative provides a basis for comparison of the effects of future conditions with and without taking the proposed Federal action. Under the No-Action Alternative, USACE would not take any actions to maintain the Keystone Harbor navigation channel. USACE would not dredge the harbor or address the continuing erosion of the neighboring beach. The likely result is that the ferry vessels would increasingly cancel sailings at low tides, and may run aground to the point of making this ferry landing unusable. Cancelled sailings cost time and money to the Washington State Ferries system, and decreased serviceability can harm the local economy of Coupeville, Port Townsend, and other towns in the area due to lost tourism money. Sailing cancellations would continue to cause delays, inconvenience, and extra cost to private and commercial traffic travelling to and from the northern Olympic Peninsula. Additionally, the beachfront area of the State Park would erode to the point of loss of the restroom building and other park features. Washington State Parks may opt to install a bank stabilization structure; however, this is not an environmentally preferable method to maintain the nearshore habitat.

## 2.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)

While some dredge events will be much less, alternative 2 consists of maintenance dredging of up 50,000 cubic yards (cy) of material per dredge event from the Keystone navigation channel from stations 0+00 to 15+00, with a maximum of five dredge events totaling 165,000 cy over the 15-year period. The method would be either mechanical dredging with material placed on a barge or hydraulic pipeline dredging. Placement of the dredged material would occur on the adjacent previously used beach disposal site, which

is approximately 2.5 acres. All the dredged sand and gravel would be used beneficially to re-nourish a section of the beach to the breakwater. Extreme ends of the beach disposal site and the disposal site baseline would be staked in the field. Dredged material would be placed water-ward, starting from the existing beach and graded uniformly to the existing grade. The method used to deposit material on the beach depends on the dredge equipment.

USACE expects the duration of dredging and material placement to take up to 60 days. Dredging would take place at night from 9pm to 5am to accommodate ferry traffic. Material placement would typically take place during the daylight hours for clamshell dredging, and nighttime for hydraulic dredging. Dredging and material placementwould occur within the approved Washington Department of Fish and Wildlife (WDFW) in-water construction window of 16 July to 15 February.

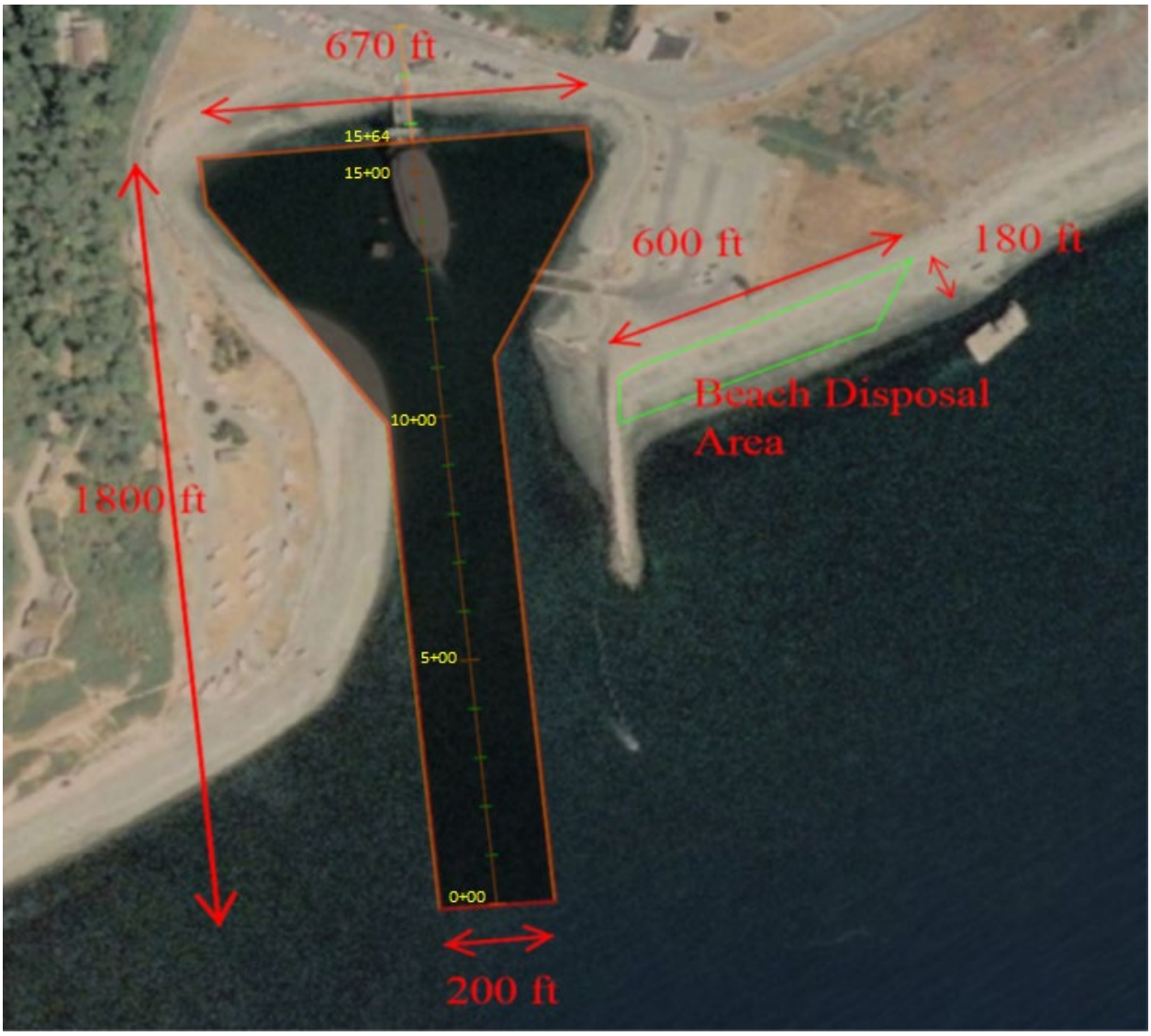


**Figure 4. Plan view for Alternative 2.**

### 2.2.1 Mechanical Dredging

A mechanical (clamshell) dredge operation includes a dredge barge with a deck-mounted crane, a clamshell bucket, at least one tugboat, and at least one sediment transport barge. Bucket capacity ranges

from two to 25 CY. During active dredging, a transport barge is tied to the dredge barge. The clamshell dredge (a type of mechanical dredge) uses a bucket deployed by a crane (derrick), mounted on a dredge barge, to remove the sediment. The bucket is sufficiently heavy to sink into the substrate. The dredge bucket has two jaws that are hinged so the bucket is open while descending through the water column (Figure 5). After closing, the top portion of the bucket remains open as the bucket is retrieved. A "controlled lowering" of the bucket reduces turbulence and the amount of suspended sediment generated. After the bucket penetrates the substrate, the bucket is closed, taking a "bite" out of the substrate. The bucket is retrieved and swung over to a transport barge where the sediment is placed for transport.. With the top and/or bottom of the bucket open, the probability of catching and retaining mobile organisms is minimal.

The dredge barge is equipped with vertical steel pipes, called spuds that are sunk into the substrate to anchor the dredge barge in one location. To move the dredge barge, the spuds are retrieved and a tug moves the dredge barge to a new location. The spuds are again sunk into the substrate to secure the dredge barge and dredging continues. Dredge barges are not self-propelled, but some dredge barges can, on occasion, move short distances by setting the dredge bucket into the substrate, retrieving the spuds, then pulling on the dredge bucket cable, and then inserting the spuds in the new location.

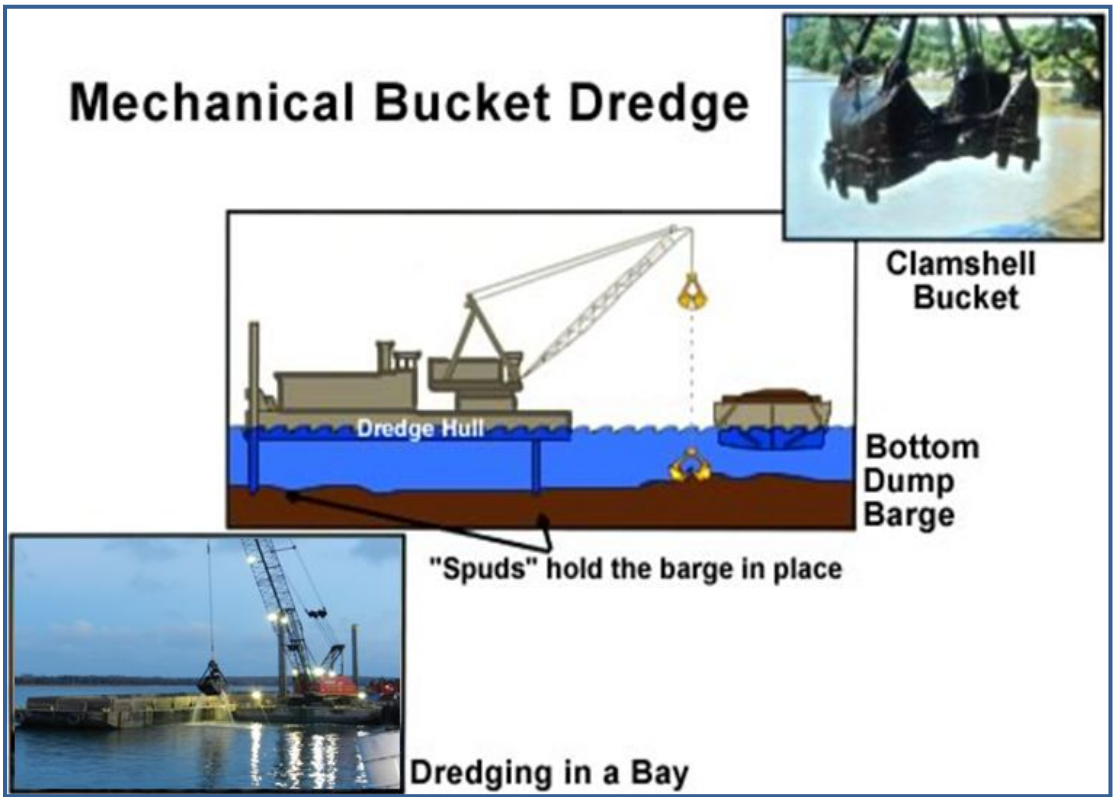


**Figure 5. Rendering of a mechanical dredge barge and bottom dump barge, with photographs of a mechanical (clamshell) dredge bucket and an operating mechanical dredge barge. Note that a bottom dump dredge would not be used for this action.**

Once full, the barge would move to the shoreline on the east side of the harbor. The barge would transload the material using the derricks or other equipment onto a truck, or it would stockpile the material directly on the shoreline above mean higher high water (MHHW). The contractor would then transfer the material to the beach that is experiencing erosion and grade it with a bulldozer, front loader, or other equipment.

### 2.2.2 Hydraulic Dredging

A hydraulic pipeline dredge employs a barge-mounted centrifugal pump, intake pipe outfitted with a cutterhead, and a discharge pipe (Figure 6 and Figure 7). The intake pipe is made of steel and is attached to the pump via a flexible joint. A rotating cutterhead is attached to the intake end of the pipe and is used to "agitate" sediment into a slurry. The intake pipe is suspended from a structure by an "A" frame, also known as a "ladder," fixed to the barge. The cutterhead and intake pipe are attached to the narrow end of the ladder and are lowered to, and in some cases, into the substrate. The depth of the cutterhead is controlled by raising and lowering the cutterhead. The depth a hydraulic pipeline dredge can reach is determined by the ladder length and the pumping (lifting) capability. The cutterhead is generally three to four times the diameter of the intake to the pipeline. As the cutterhead rotates and cuts into the substrate, suction created by the pump draws water and sediment into the intake pipe. A 12-inch dredge might have a 36-inch to 48-inch diameter cutterhead. The size of a cutterhead dredge is determined by the diameter of the outlet pipe of the dredge.

The machinery that powers the hydraulic dredge is located in the barge (Figure 6). To function properly, the hydraulic pipeline dredge must take in a slurry of water and sediment. The dredge barge is not self-propelled but can be moved short distances using anchors and spuds. A small tender vessel sets the anchors. A spud at the opposite end of the barge from the cutterhead is set and the anchor winches retrieve the anchor lines in such a way that the dredge pivots on the set spud sweeping the cutterhead across the area to be dredged. At the end of the sweep, another spud is set, the first spud is retrieved, and the anchor line process is repeated sweeping the cutterhead across the area to be dredged in the opposite direction. In this fashion, the dredge moves forward. A tender vessel redeploys the anchors as needed, again facilitating forward movement of the support dredge. A variation on this theme is a barge with a "walking" spud. In this case, a spud is located in a slot along the centerline of the barge at the end opposite the cutterhead. To move the barge forward or backward, the spud is used as a stationary point and the barge pushes or pulls against the spud. The anchors and anchor lines are still necessary to pivot the support barge during maintenance dredging.

To summarize, a hydraulic dredge operation includes a support barge with an "A" frame (ladder), and a tender vessel or a tugboat to move the support barge into position.


**Figure 6. Small Hydraulic Dredge, Barge, and Machinery that Powers the Hydraulic Dredge**

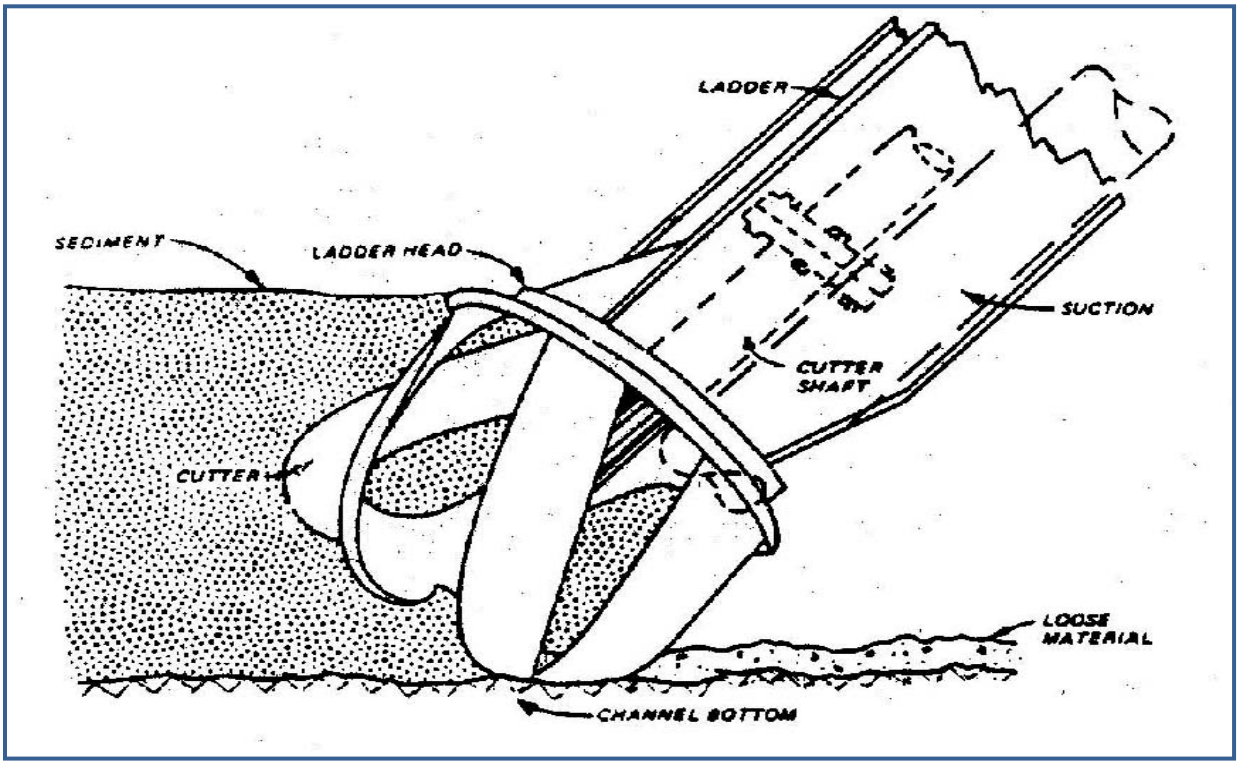


**Figure 7. Cutterhead in Operation, Including the Major Components**

The dredged material would be pumped to the adjacent beach area (Figure 4). To minimize turbidity, berms would be pushed up using onsite material to preclude effluent from flowing directly into receiving water without ponding/settling or filtering through the berm. A bulldozer or similar equipment would move the output pipeline along the placement area as material accumulates.

## 2.3 Alternative 3 – Maintenance Dredging with Open Water Disposal

Under Alternative 3, dredging would occur as the clamshell method described in Alternative 2; however, USACE would place dredged material on a barge and transport it 14 miles away to an open-water dredged material disposal site (Figure 8). The amount of material would be the same described in Alternative 2. The Puget Sound Dredged Disposal Analysis (PSDDA) Port Townsend site is one of eight multi-user disposal sites located in Puget Sound and the Strait of Juan de Fuca.[2] If Alternative 3 were selected, no additional environmental compliance requirements would apply to the disposal component of the proposed project except for the Water Quality Certification (WQC) from Washington Department of Ecology (WDOE). All required permits and approvals have been obtained for all disposal activities at the eight PSDDA sites. Disposal activities at the Port Townsend site were evaluated in a 1989 programmatic environmental impact statement (PSDDA 1989), and the Biological Evaluation was updated in 2015. Those documents are incorporated by reference herein.

While the Open-water Disposal Alternative would result in the necessary channel maintenance and disposal of dredged material, erosion of the beach would continue and eventually threaten the upland park facilities and the jetty. This alternative would likely have higher transportation costs to move the dredged material farther away and it would fail to take advantage of the opportunity to use the material beneficially to nourish a starved beach. In addition, the Port Townsend PSDDA site is closed 1 September to 30 November to protect shrimp, which would restrict the dredging and disposal window. Open water disposal would not meet the need of protecting the jetty and infrastructure at Fort Casey State Park.

[2] The PSDDA program is a multi-agency effort to manage dredged material disposal in Puget Sound, and has been renamed the Dredged Material Management Program (DMMP). DMMP manages eight multi-user disposal sites, evaluates suitability of dredged material for disposal at those sites, and monitors effects of disposal at each site. Responsible agencies include the U.S. Army Corps of Engineers, Seattle District; the U.S. Environmental Protection Agency, Region 10; the Washington Department of Natural Resources; and Washington Department of Ecology.

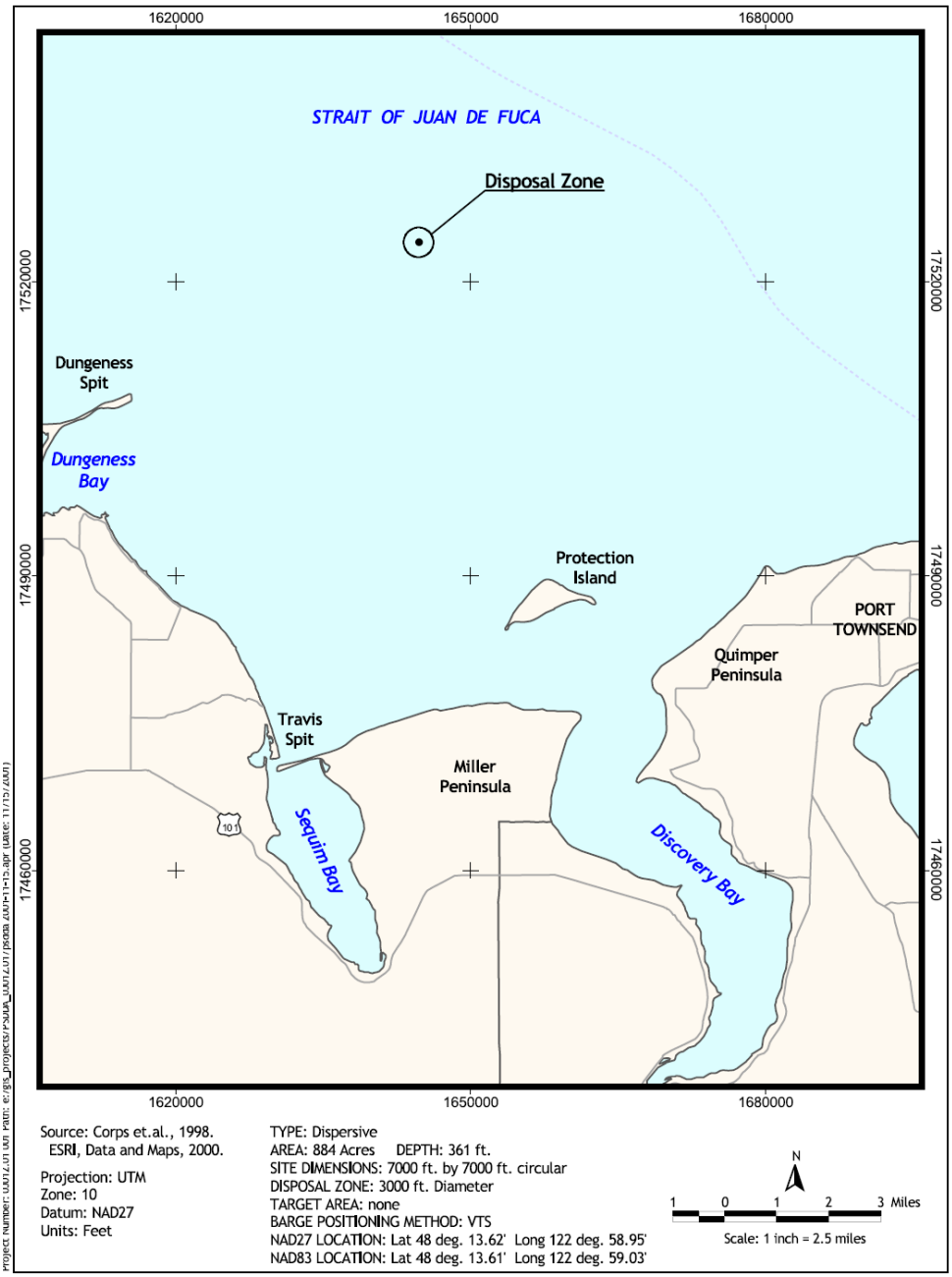


**Figure 8. PSDDA-approved Port Townsend open water dispersive disposal site.**

# 3 ISSUES FOR COMPARISON OF THE ALTERNATIVES

This section provides information on issues relevant to the decision process for selecting the preferred alternative. This analysis investigates the potential for activities associated with the considered alternatives to affect (either adversely or beneficially) the various issues of concern, and provides a comparative assessment of each alternative's effects to the environment. Factors for selecting the recommended plan include finding the plan that is the most cost effective and the least environmentally damaging.

## 3.1 Resources Analyzed and Screened Out from Further Analysis

The environmental analysis conducted in the NEPA process should provide the decision maker with relevant and timely information about the environmental effects of his or her decision and reasonable alternatives to mitigate those impacts. Table 1 identifies the resources evaluated for detailed analysis with a rationale for inclusion or exclusion. Resources were excluded from detailed analysis if they are not potentially affected by the alternatives or have no material bearing on the decision-making process.

Table 1. List of resources considered for detailed effects analysis and rationale for inclusion or exclusion

| Resource | Included in Detailed Analysis (Y/N) | Rationale for inclusion or exclusion |
|---|---|---|
| Navigation and Economic Conditions | Y | The purpose of the project is to have beneficial effects to navigation. |
| Hydrology and Geomorphology | Y | Problems identified center on the relationship between hydraulics and geomorphology. The proposed action requires study of these characteristics. |
| Groundwater | N | The proposed action is limited to the subtidal and beach environment. No groundwater would be affected. |
| Water and Sediment Quality | Y | Analysis is required to determine the intensity of potential changes to turbidity and dissolved oxygen, and impacts from potential removal of sediments. |
| Air Quality | Y | The air-pollutant concentrations in the study area have consistently been below the National Ambient Air Quality Standards; however, an analysis of pollutants emissions from construction is necessary to disclose to the public. |
| Greenhouse Gas Emissions | Y | Emissions that would occur during construction should be analyzed and disclosed to the public. |
| Noise | Y | The action has the potential to impact sensitive noise receptors during construction, including fish and wildlife. Analysis is required to determine the intensity of effects. Noise impacts to fish and wildlife would be evaluated under the fish and wildlife sections. Impacts to human receptors would be evaluated under the noise section. |
| Hazardous, Toxic, and Radiological Waste | N | There are no known contaminants in the Keystone Harbor. This is a navigation channel that is regularly dredged, and has an associated sediment suitability determinations (SSD). The most recent SSD indicated that all materials meet criteria for aquatic disposal. |
| Benthic Organisms | Y | Benthic macro-invertebrate populations are known to recover quickly from the type of action proposed. Significant effects are not anticipated, but analysis is required to determine intensity of effects. |
| Fish | Y | Many different fish species may be present. Analysis is required to determine which species would be present, the intensity of effects, and how to avoid or minimize effects. |

| Resource | Included in Detailed Analysis (Y/N) | Rationale for inclusion or exclusion |
|---|---|---|
| Wildlife (birds and mammals) | Y | Many different wildlife species may be present. Analysis is required to determine which species would be present, the intensity of effects, and how to avoid or minimize effects. |
| Vegetation | Y | There is little aquatic vegetation within the navigation channel, but it is present in the surrounding waters. Analysis of impacts is necessary. |
| Threatened and Endangered Species | Y | The proposed action may affect ESA-listed species in the study area. Analysis is required to determine the intensity of effects and how to avoid or minimize impacts. |
| Invasive Species | N | Maintenance dredging would not increase the number of vessels entering Keystone Harbor, nor would the origin of the vessels change. Introduction of invasive species from outside sources is not a concern. |
| Cultural Resources | Y | Analysis is required to investigate cultural resources and to determine the extent of any potential effects. |
| Indian Trust Assets | Y | The study area is within treaty-reserved fishing areas, called Usual & Accustomed areas. No substantial negative effects are anticipated, but analysis is required to avoid and minimize effects. |
| Aesthetics | N | The proposed action would have no permanent effect to scenic resources or visual characteristics of the study area. |
| Recreation Resources | Y | Recreational resources within the study area may be temporarily impacted during dredging and placement of materials. Analysis is required to determine the intensity of effects. |
| Public Services and Utilities | Y | The proposed action would have no substantial effect on electricity, water, wastewater and stormwater collection, sewer and solid waste, natural gas, oil/petroleum, or telecommunications services. However, navigation does affect the Ferry Service, which is provided to the public, and can include emergency vehicles. |
| Public Health and Safety | N | All material is deemed suitable for open-water disposal or beach nourishment No impacts to public health or safety are anticipated. |
| Land-based Transportation and Traffic | N | There would be no impacts to land-based traffic. All work would occur in the water and along the beach. There would be negligible impacts to ferry service since all dredging would occur between 9pm and 5pm. |

For Alternative 3, note that the placement of materials at the proposed disposal site is the DMMP designated Port Townsend open-water dispersive disposal site managed by the DMMP agencies (Figure 8). Effects from disposal of dredged material at the approved Port Townsend disposal site have been evaluated in detail in the PSDDA Phase 2 EIS (USACE 1989). The following topics were discussed for impacts from aquatic disposal of dredged material in the 1989 EIS mentioned above: geology, water

quality, currents and sediment transport, marine and estuarine sediments, air quality, benthic communities, plankton communities, anadromous and marine fishes, marine mammals, water birds, endangered and threatened species, social economic, navigation development, dredging and disposal activity, Native American Treaty fishing, non-Indian commercial and recreational fishing, and aesthetic setting. This impact analysis for these resources is incorporated by reference.

## 3.2 Context for Cumulative Effects Analysis

Cumulative effects result from the "individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). NEPA requires the evaluation of cumulative effects of the proposed dredging and disposal operations to assess the overall effect of the proposed action on resources, ecosystems, or human communities in light of past, current, and reasonably foreseeable future actions within the Keystone Harbor and adjacent waters. The cumulative impact analysis includes actions by Federal, non-Federal, and private entities. Actions with the highest potential for cumulative effects in this area would be continuation of commercial and recreational vessels using the waters within and surrounding the navigation channel and any shoreline development.

### 3.2.1 Historic Landscape Conditions

The U. S. Coast Survey began mapping the Puget Sound nearshore in the 1840s. The agency's topographic sheets (or "T-sheets") are the most comprehensive and detailed early map representations of nearshore conditions in the second half of the 19th century (Figure 9). The 1870 T-Sheet of Lake Crockett, overlain on a 1998 orthophoto, is provided in Figure 10 (courtesy the Washington Department of Natural Resources, Aquatic Resources Division). The size of the lake at this time was approximately 600 acres, though some modifications had already obscured pre-settlement conditions. The lake had been drained with a ditch and diked for hay and pasturage by the time of the survey, reducing it to a third of its original size (Nesbit 1885, as cited by Collins and Sheikh 2005). The T-sheet indicates that Lake Crockett was a closed lagoon fronted by a barrier beach.

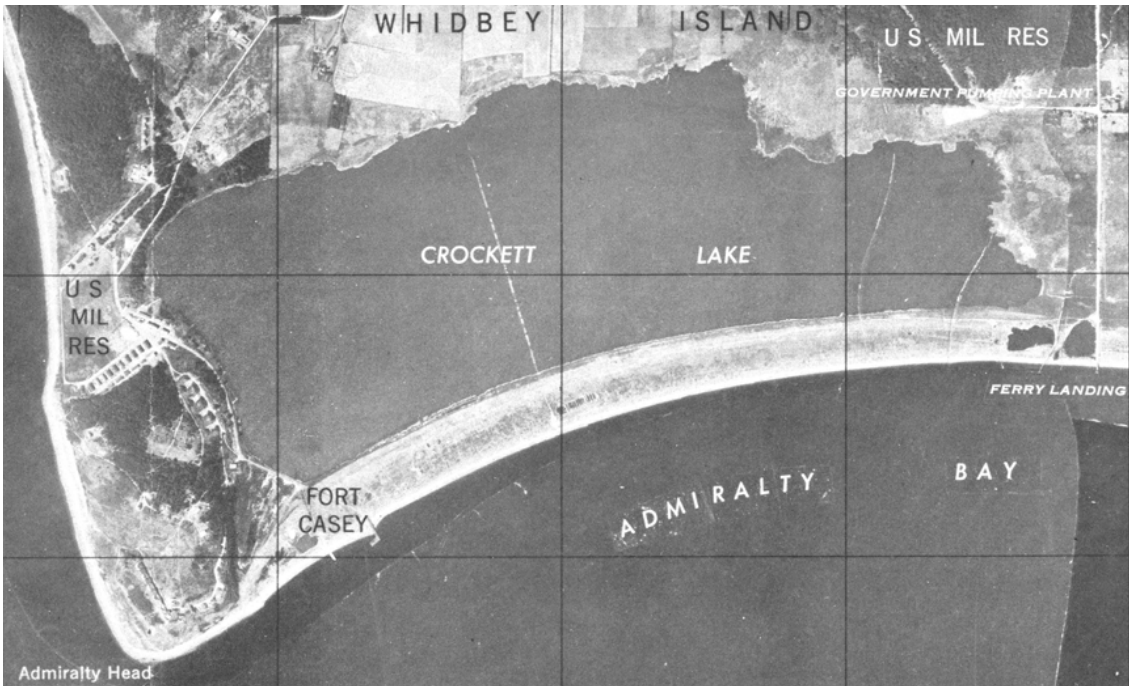


**Figure 9. Shoreline of project area before the construction of Keystone Harbor in 1948 (WSDOT 2005).**

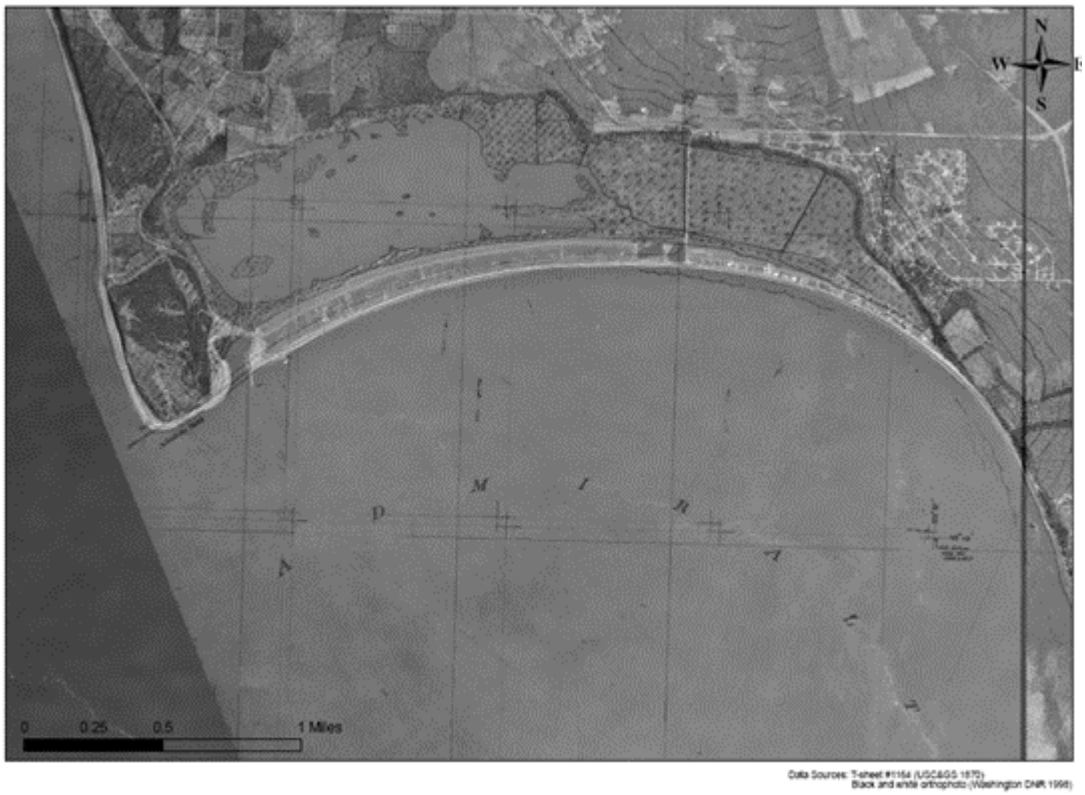


**Figure 10. 1870 T-Sheet overlaid on a 1998 orthophoto showing little or no change to shoreline shape during this period.**

USACE mapped the Lake Crockett area in 1914. At that time, the high water mark on the Admiralty Bay side of the barrier beach was between 200 and 800 feet from Lake Crockett's mapped edge. The map indicated the mean lake level was almost five feet above mean low water of Admiralty Bay. By this time, the United States Quartermaster Department wharf had been constructed, along with a wharf access road traversing the triangular marsh area in the southwestern corner of the lake. A drainage ditch through the barrier beach west of the Quartermaster wharf is visible. Other improvements shown on the map include a rail trestle over the lake and barrier beach, a pumping station, a pipeline, and a second wharf east of Admiralty Head. The 1914 map accompanied a report to the U.S. House of Representatives on a proposal to construct a channel connecting Admiralty Inlet with Lake Crockett. This report provides useful information about the physical condition of Lake Crockett in the early portion of the 20th century. Excerpts are provided below.

> *…Crockett Lake is…about 1½ miles long and has an average width of one-half mile. The lake is separated from Admiralty Bay, an arm of Admiralty Inlet, by a narrow strip of gravel beach through which the salt waters of Puget Sound readily percolate, making its waters brackish and maintaining the water surface at about the level of mean tide.*
>
> *4. A hydrographic survey of the western half of Crockett Lake was made in 1904, showing an average depth of water of about 3 feet and a maximum depth of 7 feet. The eastern portion of the lake is shallower than the western and has an average depth of only about 2 feet.*
>
> *5. In former years, by the use of drainage ditches with tide gates, the level of Crockett Lake was considerably lowered and much land reclaimed for agricultural purposes, but in recent years*

*these drainage ditches have become clogged or closed, and there is no longer a free connection between the waters of the lake and Puget Sound…*

USACE prepared a more detailed map of the area providing elevation data for the barrier beach and Lake Crockett in 1941. This map accompanied a report to the U.S. House of Representatives on the proposal to construct Keystone Harbor. Mapped structures include the Quartermaster wharf and associated access road, as well as a Keystone ferry slip almost 1.5 miles to the east of the Quartermaster wharf. The report provides additional information about habitats in the project area:

*…Tidal currents, which are strong in Admiralty Bay, follow the shore and generally flow from east to west during both the flood and ebb, so that landings at Fort Casey wharf and Keystone ferry slip are at all times difficult…The spit is constantly receiving accretions of gravel on the bay side, so that Quartermaster wharf at Fort Casey has had to be extended to maintain sufficient depth at its face to land vessels…*

*5. The drainage area of Crockett Lake is about 3 square miles. The lake is flanked on the west by comparatively steep hillsides. On the north and east are gentle slopes with marshland intervening. The marshland is said to comprise about 400 to 500 acres and to be useful for pastures. There is no creek of any considerable size flowing into the lake. Its level is maintained by surface drainage and springs and by percolation from Admiralty Bay. Depths in the lake vary from 3 feet to 7 feet below mean lake level which is 7.7 feet above mean lower low water in the bay. The gravel spit between the lake and the bay varies from about 450 feet to about 800 feet in width at low tide and its maximum surface elevation is about 16 feet above mean lower low water in the bay, or about 7 feet above mean higher high water.*

*29. …During the construction of Fort Casey large quantities of sand and gravel for concrete were excavated from the spit in the vicinity of the proposed channel into the lake…*

*56. The spit through which the channel would have to be dredged is composed of heavy gravel. Accurate records are not available but it is believed that this spit is increasing in width to the south at the rate of about 1 foot annually owing to accretions of gravel brought from the bluffs to the east and south by the prevailing westerly set of the littoral current, which at times attains a velocity estimated at 6 or 7 knots. The beach in front of the spit has a steep grade and is exposed to the southerly storms that prevail during the winter season.*

Keystone Harbor is an artificial harbor built in 1947-48, with a stone breakwater constructed on the eastern side of the harbor. The Federal navigation channel is typically dredged every four to six years. The navigation channel was widened in 1971 and deepened in 1993 through USACE's Continuing Authorities Program, Section 107, to the current project depth of -25 MLLW with authorized overdepth maintenance to -27 MLLW. Table 5 provides a list of dredging actions in Keystone Harbor.

**Table 2. History of Dredging Activity in the Federal Navigation Channel**

| Year | Amount Dredged (cy) | Disposal Site(s) |
|---|---|---|
| 1947-48 | 419,000 | 169,000 cy – side cast fill around basin<br>250,000 cy – open water |
| 1955-56 | 24,000 | open water below 60' depth |
| 1960 | 27,000 | Beach nourishment east of jetty |
| 1966 | 39,000 | Beach nourishment east of jetty |

| Year | Amount Dredged (cy) | Disposal Site(s) |
|---|---|---|
| 1971 widening | 40,000 | Beach nourishment east of jetty |
| 1976 | 31,000 | Beach nourishment east of jetty |
| 1980 | 26,000 | Beach nourishment east of jetty |
| 1988 | 30,000 | Beach nourishment east of jetty |
| 1993 deepening | 33,000 | 25,000 cy – beach nourishment east of jetty<br>8,000 cy – open water near Pt. Townsend |
| 1999 | 30,000 | Beach nourishment east of jetty |
| 2006 | 45,000 | Beach nourishment east of jetty |
| 2011 | 34,920 | Beach nourishment east of jetty |

### 3.2.2 Existing Conditions

A tide-gate controlled culvert drains Crockett Lake into Keystone Harbor on low tides. Currently, the lake is saline, with most of the saltwater input coming as interstitial flow through the gravels of Keystone Spit. In late summer, boards that prevent back flow from the harbor into the lake via the Keystone Harbor culvert are removed and saltwater input also enters the lake via this route (Wait et al. 2007).

The initial and repetitive dredging actions and manipulation of lake levels has contributed to degradation of the biological function from its prehistoric condition. Water levels in Lake Crockett continue to be managed to levels lower than desired by the NPS. The tide gates are still in place but in disrepair; it is unclear to what extent the gates still inhibit natural water flow and fish passage (NPS 2005). Significant salt marsh areas remain, but the partially drained lake is less productive for wildlife because benthic organisms cannot survive in the mudflats without regular inundation. The natural resource and scenic value of Lake Crockett remains greatly reduced by manipulation of lake levels (NPS 2005) However, since 2005 554 acres surrounding Lake Crockett has been purchased or donated for protection; much of this acreage has been replanted with native vegetation (Whidbey Camano Land Trust 2019).Since the hydrogic connection of Lake Crockett are similar to pre-European settlement conditions, restoration efforts focused on preserving remnant forests, removing invasive vegetation and replanting native vegetation, and adding woody debris to enhance biological functions (NPS 2007). Keystone Harbor's primary use is ferry access to Whidbey Island. Recreational boaters also use the harbor and can access it via the Keystone Spit boat ramp at Fort Casey State Park on the eastern shoreline.

### 3.2.3 Reasonably Foreseeable Future Actions

Continued use of Keystone Harbor for ferry service and recreational boating is likely. Development of the shoreline surrounding and adjacent to the harbor is unlikely, as it is surrounded by Ebey's Landing National Historic Reserve and by Fort Casey State Park.

## *3.3 Resources Analyzed for the Effects of the Alternatives*

### 3.3.1 Navigation and Economic Conditions

Typical socioeconomic analysis considerations include employment, population, income, economic growth, and public infrastructure. Of the 84,460 residents in Island County, the median household income is $61,516 and the top employment sectors are retail, healthcare and social assistance, and the hospitality industry (U.S. Census Bureau 2019). Keystone Harbor is located in central Whidbey Island near the town

of Coupeville, which is the location of most of the county government offices and a small general hospital. The Washington State Ferry terminal at Keystone Harbor is an important connection point for private auto traffic and the movement of a great deal of commercial goods across northern Puget Sound. The Port Townsend-Coupeville ferry route has an annual ridership of over 838,739 people, which includes private, public, and commercial vehicles (WSDOT 2019).

#### *3.3.1.1 Alternative 1 – No-Action Alternative*

For USACE to take no action toward maintaining the navigation channel would mean increasing cancellations of ferry sailings, which eventually could cause reduced tourism to Whidbey Island and Port Townsend, as well as an increased cost to companies that transport commercial goods across northern Puget Sound. Effects of reduced auto and commercial vehicle traffic could reduce employment, income, and economic growth among the communities served by this transportation connection.

#### *3.3.1.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

Alternative 2 would maintain the present capability of the Washington State Ferry system to provide service at the Keystone ferry terminal. This alternative would have no effect on the socioeconomics of the region, and would meet the need for maintaining the connection across northern Puget Sound. It is the least cost alternative that meets the purpose and need for the project.

#### *3.3.1.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Alternative 3 would maintain the present capability of the Washington State Ferry system to provide service at the Keystone ferry terminal.

Impacts to navigation and economy at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

### 3.3.2 Hydrology and Geomorphology

Tides of Puget Sound are mixed-semidiurnal with significant biweekly spring-neap modulation (Mofjeld and Larsen 1984). Thus, twice each day, the shorelines are alternately underwater and exposed to the air, rain, or sun. Beaches can be delineated into zones based on the length of time the substrate is underwater or exposed to air. The *intertidal* zone is between the limits of the tidal highs and lows and is inundated and exposed during each tidal cycle. The *sub tidal* zone is under water except during extreme low tides. The *supratidal* zone, or splash zone, is not frequently inundated except during extreme high tides. In the mid-sound, the mean tidal range is 7.66 feet and the maximum is 14.4 feet of difference between the lower low and higher high tide. This tidal range lessens to the north, where Keystone Harbor is located. The twice-daily exchange of this water can produce strong tidal currents through the narrow passages like Admiralty Inlet. In Puget Sound, waves are primarily limited by fetch (the distance over water the wind blows), resulting in waves with small to moderate heights and short periods (Downing 1983).

The barrier beach that separates Admiralty Bay from Lake Crockett was formed by material eroded from high bluffs of glacial outwash located to the west at Admiralty Head, and to the southeast of the navigation project. Active erosion of these “feeder” bluffs supplies sediments to adjacent beaches. Currents along the shoreline move sediments that become sorted by size; finer material drifts offshore to less turbulent waters, and larger sand, gravel, and cobbles are carried by littoral drift to adjacent beaches. The bluffs southeast of Keystone Harbor have been estimated to supply northern Admiralty Bay beaches with more than 15,000 cy of sediment annually (WSDOT 2005). Two drift cells occur within the northern portion of Admiralty Bay (Figure 10). Littoral drift moves material east from Admiralty Head and west from bluffs 3.5 miles southeast of the Harbor (USACE 1972). A nodal point (area of zero net beach movement) exists on the beach about 11,000 feet east of Keystone Harbor.

Construction of the harbor and jetty created a littoral trap for the Admiralty Head feeder bluff. The effect of this trap is accretion inside Keystone Harbor and erosion of the beach east of the harbor entrance. During the 1950s, the beach east of the jetty eroded rapidly. Erosion undermined the jetty structure, which required repairs in 1950, 1954, and 1960. Since 1960, most material dredged from the navigation channel has been placed on the beach to the east of the jetty. The dredged material serves as a beach nourishment stockpile, eroding gradually through wave action and tidal currents. Although the channel and jetty interrupt the Admiralty Head drift cell, dredging and beach nourishment provide a bypass mechanism that supplies sediments to two miles of beaches downdrift of the jetty. Over 220,000 cy of sediment have been placed east of the jetty since 1960, allowing for maintenance of a nearly equilibrium shoreline shape and position.

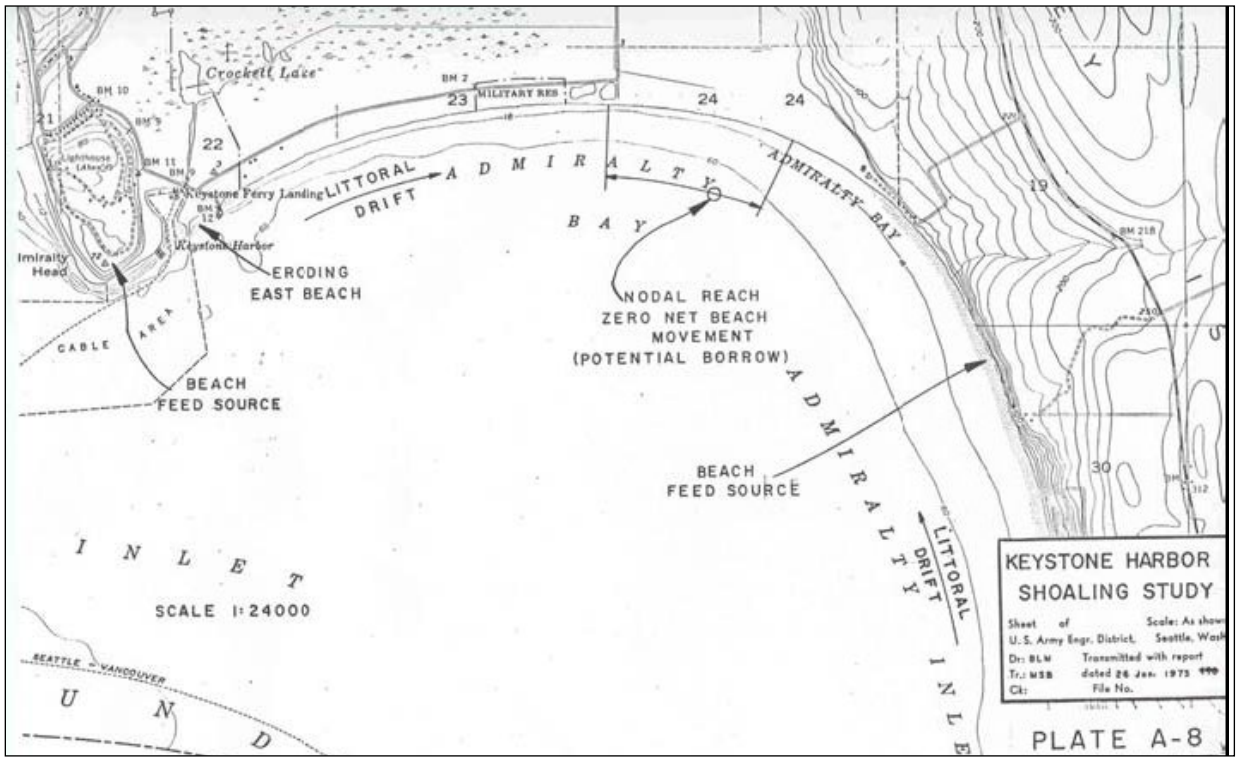

**Figure 11. Littoral drift cells in the project area (USACE 1972).**

### *3.3.2.1 Alternative 1 –No-Action Alternative*

For the No-Action Alternative, USACE would not dredge the shoaling Keystone Harbor, further decreasing the depth of the harbor and limiting navigation. Without placement of material along the eroding shoreline, the effect to the geology and geomorphology of the project area is that the shoreline erosion would likely continue threatening access to the jetty, parking lot, and park facilities. The material that accumulates in Keystone Harbor, roughly 6,500 to 10,000 cy per year, would not be available to the natural system of sediment transport along this reach of Admiralty Bay. This alternative does not meet the need for the project.

### *3.3.2.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

This alternative would entail dredging up to 50,000 cy from the entire 1,800-foot long channel and areas to the east and west of the ferry terminal to return depths in the navigation channel and boat basin to -27 MLLW. Based on historic sediment characterization and the coarse gradation of the sediment, USACE has determined the dredged material is suitable for depositing as beach nourishment. Dredging would

have no effect on the character and grain size distribution provided by the adjacent feeder bluff. Beach nourishment would compensate for the interruption of the littoral drift cell by moving the shoaled material back into the drift cell and would prevent erosion and loss of infrastructure at the State Park. The average rate of shoaling in the harbor has historically been approximately 6,500 cy per year. Past dredging of an average of 40,000 cy every four to six years with placement on the adjacent beach has been sufficient to maintain the balance that erodes from the beach. The proposed quantity of 50,000 cy per dredge event is presumed to be sufficient to nourish the beach and prevent undermining of the jetty based on historic dredging quantities.

This alternative would maintain the historic geomorphology of a sediment transport system at equilibrium such that the shape of the shoreline does not change. Tidal hydrology would not change. Significant impacts are not anticipated.

#### *3.3.2.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Under this alternative, USACE would dredge the same amount of material from the channel. Effects to the geomorphology of the project area would be similar to the effects of Alternative 2 within the channel. However, there would be no beach nourishment, and without it, erosion and eventual loss of infrastructure are likely.

Impacts to hydrology and geomorphology at the open water disposal site are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.2.4 Cumulative Effects of the Proposed Action*

The preferred alternative maintains the historic geomorphology and no significant impacts to hydrology are anticipated. There are no other past, present, or future actions in the areas that, when combined with impacts of the proposed action, would rise to the level of significant cumulative impacts.

### 3.3.3 Water and Sediment Quality

Admiralty Inlet is generally more saline than the rest of Puget Sound due to the proximity of the Strait of Juan de Fuca and its direct connection to the Pacific Ocean. The interchange of freshwater contributed from rivers around Puget Sound and the deeper more saline water create stratified mixing with cooler saline water on the bottom. Typical sources of water pollution in the Puget Sound region are industrial waste, combined storm-sewer overflow events, and storm water runoff from developed areas. WDOE has rated the water quality of Admiralty Inlet as Class 1, meeting standards for all uses.

The material that shoals in Keystone Harbor is composed of sand and gravel (less than 3% fines) eroding naturally from unaltered bluffs to the west of the navigation channel. Previous testing showed the material to be dredged is ranked low concern for characterization by the DMMP agencies. A full DMMP characterization of two composited samples occurred in 1988. One composite consisted of material from the east side of the entrance channel, and the other consisted of material from the west side of the entrance channel. The results of these analyses showed that all chemicals of concern from the composited sample west of the channel were measured below DMMP screening levels (SL), level of specific chemicals below which there is no reason to believe that disposal of that material would result in unacceptable adverse effects. The composited samples from the area east of the channel (the receiving area for nourishment material) were below SL and Washington sediment quality standards, except for phenol. Phenol in Puget Sound has natural and anthropogenic sources, mainly from decomposition of conifer needles and wood chips, respectively. The spatial and temporal variability of phenol in Puget Sound indicates more natural sources (SAIC 2005). Phenol does not persist in the environment and dissipates in a few days after release. The material sampled at Keystone in 1988 met exclusionary criteria under CWA: 40 CFR 230.60 (subparagraphs a, b, and c). The exclusionary criteria state that material meets the criteria

and can be excluded from further testing if (1) it is predominantly sand from high current/wave energy area; and (2) dredging area is sufficiently removed from contaminant sources; and (3) the disposal site is adjacent to the dredging site.

Sediments were tested again, in 2011, according to DMMP protocol, and they determined that results indicated that that material dredged from Keystone Harbor is suitable for beach nourishment/beneficial use (USACE 2011). This sediment suitability determination (SSD) expired in 2018. Another round of testing is underway, with an anticipated SSD completion date in spring of 2020. Preliminary data suggests all the material is clean and suitable. Based on these results and the 2011 SSD, USACE expects a determination that that the material is clean and suitable for beneficial use. Contaminants do not adhere to the grain size (sand/gravel) of the material present at the site. Furthermore, the dredging/disposal site is in a highly dynamic littoral drift current/tidal area, and is free from any known sources of contamination. If the 2020 SSD determines the material is clean and suitable for beneficial use, then the project would be downgraded and only require conformity testing every 10 years. Future dredge events within this 15-year EA would require a current SSD determination.

#### *3.3.3.1 Alternative 1 – No-Action Alternative*

Without dredging in the navigation channel, continued shoaling would likely decrease depths in the basin. Therefore, propeller wash from routine ferry traffic would likely increase the amount of material suspended in the water column each time the ferry enters and exits the harbor.

#### *3.3.3.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

The only effect to water quality that is expected during dredging is turbidity due to pulling sediments off the harbor floor. If a mechanical dredge is used, turbidity may increase in the area immediately surrounding the dredging vessel as the clamshell bucket pulls the sediment up through the water column. If a hydraulic dredge is used, the turbidity stays at the bottom of the water column. For both types of dredging, turbidity is expected to be of short duration, such as only a few minutes because of the coarseness of the material. The large particles typically fall quickly and do not remain suspended. Dredging would cease intermittently to avoid affecting the WSDOT ferry, thus providing periods for suspended sediments to settle. The potential increase in turbidity is deemed discountable because the daily periodic movements of the WSDOT ferries and subsequent propeller wash routinely suspend bottom sediments in the shallow harbor. The material to be dredged and placed on the beach would be tested with standard PSDDA protocols by the DMMP. The material is ranked as having a low concern, and no negative effects from contaminants, including phenols, are anticipated. Dissolved oxygen (DO) tends to decline in the vicinity of dredging operations when the suspension of anoxic sediments creates high chemical oxygen demand. However, given the tidal flushing and currents in Admiralty Bay, impacts to DO are expected to be highly localized and undetectable.

During placement, the majority of materials used beneficially would be placed above the MHHW line. The USACE contractor would allow the turbid water to drain from the material while it is staged on the shore before it is graded with a bulldozer. During all phases of construction, USACE would employ best management practices for equipment operation and storage and use of hazardous materials. No leakage or spills of hazardous materials are expected to occur. USACE would monitor water quality during construction per the conditions and criteria issued in WDOE's WQC. Should turbidity levels reach an unacceptable level, work would temporarily cease until water quality is restored.

Given the temporary and localized effects to water and sediment quality, no significant impacts are anticipated.

#### *3.3.3.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Consequences to water quality for Alternative 3 would be the same as for the clamshell methods described in Alternative 2, but with no potential for impacts at the beach disposal site.

Impacts to water and sediment quality at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.3.4 Cumulative Effects of the Proposed Action*

Because water and sediment quality are considered good and impacts of the proposed action would be temporary, cumulative impacts would occur only if other construction activities occur at the same time as the proposed dredging and disposal. This is highly unlikely given the surrounding area is either historical reserve or state park. Elevated turbidity from the ferry propeller wash combined with any generated from dredging activities are also unlikely since dredging would occur between 9pm and 5am to accommodate daytime ferry traffic. Furthermore, no significant cumulative impacts to water quality are expected given the tidal flushing and currents in Admiralty Bay.

### 3.3.4 Air Quality, Greenhouse Gas Emissions, and Noise

The U.S. Environmental Protection Agency (EPA) creates regulations as required by the Clean Air Act. EPA is responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS criteria pollutants of concern in the project area are carbon monoxide (CO), ozone (often evaluated by measuring ozone precursors such as reactive organic gases [ROGs] or volatile organic compounds [VOCs]), lead, nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM). PM is classified by size: $PM_{10}$ refers to all PM 10 microns in diameter or smaller and $PM_{2.5}$ refers to all PM 2.5 microns in diameter or smaller. Areas of the country where air pollution levels persistently exceed the NAAQS are designated as "non-attainment" areas. The EPA has set *de minimis* threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone) for non-attainment areas; however, no standards are set for greenhouse gas (GHG) emissions in Washington State. Air quality in Keystone Harbor area is generally good and is in an attainment zone. The project area is rural-agricultural with the town of Coupeville a few miles away. Motor vehicles, including the ferries, are the largest source of air pollutants. Particulates, sulfur dioxide, ozone, and carbon monoxide are the pollutants of concern.

Carbon monoxide, a product of incomplete combustion, is generated by automobiles and other fuel burning activities (e.g. residential heating with wood). The highest ambient concentrations of carbon monoxide tend to occur in localized areas such as major roadways and intersections during periods of low temperatures, light winds, and stable atmospheric conditions. Ozone is a highly reactive form of oxygen created by sunlight-activated chemical reactions of nitrogen oxides and volatile organic compounds. Unlike high carbon monoxide concentrations, which tend to occur close to emission sources, ozone problems tend to be regional since ozone precursors can be transported far from their sources. Motor vehicle engines primarily generate ozone precursors.

Regarding airborne noise, this rural and recreational area is typically quiet. Common noise sources consist of those generated by the Washington State ferry, trucks and automobiles on State Route 20, farm machinery, other internal combustion engines, and frequent aircraft from Whidbey Naval Air Station.

#### *3.3.4.1 Alternative 1 No-Action Alternative*

No effects are anticipated as a result of the No-Action Alternative.

*3.3.4.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

The dredge and the tugs necessary to move the dredge and barges are diesel powered and thus contribute to air pollution; however, the amount of air pollution generated by the dredge operation would be minimal compared to any one of the large ocean-going ships that traverse Admiralty Inlet. The increases in air pollutants would be temporary, occurring only during the short duration of dredging operations. To estimate emissions, USACE used a Harbor Craft, Dredge and Barge emission calculator for marine equipment and a non-road equipment emission calculator for land-based construction equipment, both from the Sacramento Metropolitan Air Quality Management District (SMAQMD 2008 and 2017). The calculations for this alternative assumed the following:

- Dredges and tugs would operate eight hours per day
- For clamshell dredging, the transport barge would operate four hours per day
- Land-based equipment (truck and bulldozer) would operate eight hours per day

Estimates of emissions for this alternative can be found in the tables below:

**Table 3. Total Clamshell Dredging Emissions with Beach Nourishment (tons).**

| Equipment | Horsepower | PM10 | PM2.5 | NOx | ROG | CO | $SO_2$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Dredge | 500 | 0.0175 | 0.0156 | 0.5858 | 0.0179 | 0.1369 | 0.0007 | 71.0569 | 0.0029 | 0.0006 |
| Tug Boat | 450 | 0.0574 | 0.0511 | 0.9983 | 0.0839 | 0.2933 | 0.0007 | 70.3637 | 0.0029 | 0.0006 |
| Transport Barge | 500 | 0.0087 | 0.0078 | 0.2929 | 0.0090 | 0.0685 | 0.0003 | 35.5285 | 0.0014 | 0.0003 |
| Bulldozer | 500 | 0.0238 | nc | 0.6288 | 0.1864 | 0.0903 | 0.0008 | 61.5426 | nc | nc |
| Truck | 50 | 0.0079 | nc | 0.0702 | 0.0354 | 0.0813 | 0.0008 | 6.5129 | nc | nc |
| **Total** | | **0.1153** | **0.0745** | **2.5761** | **0.3326** | **0.6703** | **0.0033** | **245** | **0.0072** | **0.0014** |

nc = Not calculated by model

**Table 4. Total Hydraulic Dredging Emissions with Beach Nourishment (tons).**

| Equipment | Horsepower | $PM_{10}$ | $PM_{2.5}$ | NOx | ROG | CO | $SO_2$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Dredge | 500 | 0.0175 | 0.0156 | 0.5858 | 0.0179 | 0.1369 | 0.0007 | 71.0569 | 0.0029 | 0.0006 |
| Tug Boat | 450 | 0.0574 | 0.0511 | 0.9983 | 0.0839 | 0.2933 | 0.0007 | 70.3637 | 0.0029 | 0.0006 |
| Bulldozer | 500 | 0.0238 | nc | 0.6288 | 0.1864 | 0.0903 | 0.0008 | 61.5426 | nc | nc |
| **Total** | | **0.0987** | **0.0667** | **2.2129** | **0.2882** | **0.5205** | **0.0021** | **203** | **0.0057** | **0.0011** |

nc = Not calculated by model.

Note that there is uncertainty with estimating the emissions of dredges and their supporting equipment given the sporadic nature of the operation. In light of this uncertainty, this table incorporates a conservative estimate of emissions and more than compensates for this uncertainty. These estimates are not intended as an exact calculation of the emissions associated with this project but rather as a means for comparison among the alternatives. Even applying the conservative operating parameters, and in light of the temporary and occasional construction activities, these emissions would not permanently or significantly affect regional air quality.

The dredge, support vessels, tugs, and trucks would emit carbon dioxide, nitrous oxides, and water vapor (all GHGs), but if the project need is to be met then there is no practical alternative to hydrocarbon (primarily fossil fuel) powered dredge and tugs. An estimated 245 tons of $CO_2$ would be emitted if clamshell dredging is used, and 203 tons of $CO_2$ if hydraulic dredging is used. Other GHG emissions, such as methane, would be much less. Although GHG emissions associated with this alternative are not expected to significantly increase the rate of climate change and sea level rise, diesel fuel consumption by

heavy machinery required for maintenance dredging, material placement, and gasoline consumption for travel to the site are a part of world-wide cumulative contributions to change in climate by way of increases in GHG emissions. However, in light of the short duration of the GHG emissions, and the unavoidability of use of diesel equipment to conduct the dredging, emissions are negligible in the context of all anthropogenic sources of GHGs, and do not constitute a significant contribution of GHGs.

Noise would be intermittent at the site and would vary depending on the frequency of dredging and placementactivities. Airborne noise levels would increase slightly above ambient while construction equipment was operating. Noise effects would endure for the two months of dredging and placement, and would remain localized to the immediate work area. Equipment work schedules would be coordinated with Fort Casey State Park to limit effects to visitors. No significant impacts to noise are expected.

#### *3.3.4.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Effects of Alternative 3 to air quality, GHG emissions, and noise would be the same as for Alternative 2 for the dredging, but would have additional emissions associated with hauling the material to the open-water disposal site. The calculations for this alternative assumed the following:

- The dredge and tug would operate 8 hours a day
- The barge would operate 24 hours per day due to the distance to the disposal site.

The estimated emissions associated with this alternative are in Table 5, below (calculated using SMAQMD 2008 and 2017 emission models).

**Table 5. Total Clamshell Dredging Emissions with Open-water Disposal (tons)**

| Equipment | Horsepower | PM10 | PM2.5 | NOx | ROG | CO | $SO_2$ | $CO_2$ | $CH_4$ | $N_2O$ |
|---|---|---|---|---|---|---|---|---|---|---|
| Dredge | 500 | 0.0175 | 0.0156 | 0.5858 | 0.0179 | 0.1369 | 0.0007 | 71.0569 | 0.0029 | 0.0006 |
| Tug Boat | 450 | 0.0574 | 0.0511 | 0.9983 | 0.0839 | 0.2933 | 0.0007 | 70.3637 | 0.0029 | 0.0006 |
| Transport Barge | 500 | 0.0525 | 0.0467 | 1.7575 | 0.0538 | 0.4107 | 0.0020 | 213.1708 | 0.0086 | 0.0017 |
| **Total** | | **0.1274** | **0.1134** | **3.3416** | **0.1556** | **0.8409** | **0.0033** | **356** | **0.0144** | **0.0029** |

Note that this alternative generates 356 tons of $CO_2$, which is substantially more than Alternative 2. Emissions of other pollutants are also higher than Alternative 2. This is attributed to the fuel required to haul material to the open-water disposal site.

#### *3.3.4.4 Cumulative Impacts of the Preferred Alternative*

GHG emissions and other air pollutants are cumulative by nature, but given the minor and temporary nature of the proposed dredging and placement when combined with emissions from other sources surrounding Keystone Harbor, including vessel and aircraft traffic, cumulative impacts are not expected to be significant.

### 3.3.5 Benthic Invertebrates

The project area hosts a great variety of marine life. The nearshore bottom between the breakwater and wharf is shallow with small rock outcrops. Sparse algae and a few horse clams (*Tresus* sp) occur here. The pilings of the wharf host numerous tubeworms and serve as substrate for barnacles (*Balanus* spp.) and sea anemones (*Metridium* sp.), which provide cover and habitat for several species of fish. The breakwater provides substrate for barnacles, anemones, chitons, mussels, and other organisms. Snails, hydroids, sea cucumbers, crabs, sea urchins, and sea stars inhabit the area (USACE 1981). The channel biota are limited to opportunistic species that colonize the area between maintenance dredging periods.

#### *3.3.5.1 Alternative 1 – No Action Alternative*

There would be no impacts to benthic invertebrates from this alternative. Over several years of reduced or eliminated ferry landings, the substrate would colonize to full climax conditions.

#### *3.3.5.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

Benthic communities in the area that would be dredged have been altered by previous dredging operations. These communities would be altered each time dredging occurs in the proposed dredging cycles, but are expected to rapidly return to their pre-maintenance dredging condition after completion of each maintenance dredging operation. Past investigations completed for dredging work in Grays Harbor have produced data that indicates that disturbed benthic communities recolonize quickly (SAIC 2005).

In 1976, USACE, with assistance from the U.S. Fish and Wildlife Service (USFWS), EPA, and Western Washington State College, conducted SCUBA surveys of the subtidal area fronting the beach disposal site before, during, and after dredging and disposal (Smith 1976). Diver observations revealed that the majority of the area did not appear significantly disturbed by the beach nourishment, as shown by the presence of macro algae, a periphyton growth of diatoms, occasional bivalves and crustaceans, sea urchins, and other benthic invertebrates. The divers determined that no noticeable changes were seen, and they considered any plant or animal losses to be minor. They observed no gross differences in feeding activity by sessile organisms. No noticeable effects to invertebrates were recorded and fish species avoided areas of high siltation. Some filter feeding organisms were covered to some extent by sediment. This did not appear to dramatically affect their feeding functions. At the old dock location, the vertical slope of the piles protected the marine life from sedimentation and no adverse effects to this community were noted (Smith 1976).

Given the minor and temporary nature of the action, effects on benthic invertebrates are not expected to result in any measurable changes or reduction in populations and would therefore be insignificant.

#### *3.3.5.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Impacts of the dredging on benthic invertebrates would be the same as those described for Alternative 2. There would be no impacts to benthic invertebrates at the beach disposal location. Impacts to benthic invertebrates at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.5.4 Cumulative Impacts of the Preferred Alternative*

As stated previously, there are diverse and healthy invertebrate communities surrounding the project. Other than the infrequent maintenance dredging and the presence of the jetty, there are no other activities in the surrounding areas that would substantially affect invertebrate communities. Given the lack of other activities and the minor and temporary nature of the project impacts, cumulative impacts to benthic invertebrates would be insignificant.

### 3.3.6 Fish

The waters in and around Keystone Harbor support rich and diverse fish communities. During a 2005 study along the western shoreline of Whidbey Island, the Wild Fish Conservancy netted a minimum of 58 different species of marine fish comprising nine separate ecological guilds. This included six species of salmonids, five types of forage fish, five species of gunnel*,* one prickleback species, a single juvenile wolf eel captured in Keystone Harbor, 14 species of sculpin, three species of greenling, lingcod, quillback rockfish, three species of surf perch, three-spine sticklebacks, gobies, bay pipefish, and two big skates (Wait 2005). Thirty-five of these species were caught in Keystone Harbor, and 33 of them were caught along Keystone Spit (the beach disposal location). That same study found juvenile coho, Chinook, chum and pink salmon along the shoreline of Keystone Harbor and Keystone Spit during the months of March through August.

According to the WDFW, forage fish spawning has not been documented within the project footprint. There is surf smelt spawning on the beach to the west, along the shoreline fronting Fort Ebey State Park. However, this area is up drift of the proposed dredging and disposal location (WDFW 2019a).

### *3.3.6.1 Alternative 1 – No-Action Alternative*

The No-Action Alternative would allow a more stable benthic community to establish in Keystone Harbor for foraging and would avoid entrainment of small fish.

### *3.3.6.2 Alternative 2 – Maintenance Dredging With Beach Nourishment*

Potential impacts to fishes include the following: 1) entrainment, resulting in direct mortality, 2) physiological damage, behavioral response, and elevated stress levels from suspended sediment, and decreased DO, 3) physiological damage and behavioral response to noise, and 4) smothering during sediment placement and temporary loss of prey within the placement footprint.

**Entrainment**

Entrainment, or the capture of fish in the dredging machinery, is possible but more likely for eggs or larval fish than adults. Evidence of entrainment of mobile adult fish shows low levels of capture; benthic fish or those in high densities are most likely to be caught (Drabble 2012). Burrowed sand lance, if present, are vulnerable to entrainment. If the dredge encounters a sand lance "hot spot" then entrainment could be high, which was shown to be the case for hopper dredging at the mouth of the Columbia River (Larson and Moehl 1988). However, hopper dredging has a much higher rate of entrainment than clamshell and hydraulic pipeline dredging. Entrainment of sand lance and other benthic fish would be localized with no detectable decreases in populations in the Keystone Harbor. Risk of entrainment of pelagic oriented fish such as salmonids is quite low (McGraw and Armstrong 1988), given their ability to avoid the dredge.

**Water Quality**

Impacts from decreased water quality (turbidity and DO) associated with dredging would be temporary in nature, but tend to be greater for clamshell dredging than hydraulic dredging. Factors affecting the physiological responses to elevated turbidity such as gill damage and elevated stress hormones include exposure time (both duration of dredging and residence time of the fish in the project area) and the shape and character of the suspended sediments. Physiological effects of suspended sediment can include gill trauma (Servizi and Martens 1987; Noggle 1978; Redding and Schreck 1987), and affect osmoregulation, blood chemistry (Sigler 1988), growth, and reproduction. Behavioral responses include feeding disruption from olfactory and visual impairment (Sigler 1988); gill flaring; and curtailment of territorial defense (LaSalle 1988). To minimize physiological impacts of elevated turbidity and decreased DO (although impacts to DO are unlikely given tidal flushing and currents) the project would monitor water quality during dredging activities and meet water quality standards issued in the WQC.

**Noise**

Fishes' sensitivity to hearing varies, but most exhibit a response to sounds in the range of 50 Hz to 2 kHz, with a minimum threshold around 70 dB (Hastings 1995). Noise frequencies from clamshell and hydraulic dredging falls within this range (Dickerson et al. 2001). The impacts vary by species, their behavior, and habitat. Noise generated by clamshell dredges is characterized as continuous (or non-pulsed), since the elevated sound pressure occurs over seconds (not milliseconds, as is the case with pulsed noise) (Agness, NMFS, pers comm., July 23, 2013). Most fish are only sensitive to the particle motion associated with sound not (hearing generalist), but some are sensitive primarily to sound pressure (hearing specialists). However, there are no particle motion measurement standards, and there is a lack of exposure criteria for particle motion (Popper 2019), therefore sound pressure levels are generally used to access impacts to all fish.

The following are noise thresholds for effects on salmonids for pile driving (both impact and vibratory) from NMFS et al. (2008). Note that like dredging, vibratory pile driving is considered continuous:

- 150 $dB_{RMS}$[3] for harassment for fish of all sizes
- 187 dB cumulative SEL[4] for injury of fish ≥ 2 grams[5] (NMFS et al. 2008)
- 183 dB cumulative SEL for injury of fish < 2 grams (NMFS et al. 2008)
- 206 $dB_{peak}$[6] for injury of fish of all sizes (NMFS et al. 2008)

More recent literature suggests that noise levels above 163.3 dB µPa peak to peak should be used for behavioral responses (Popper 2019, Hawkins et al. 2014).

Popper et al. 2014 proposed the following criteria for noise impacts on fish:

- For fish with swim bladders that are involved in hearing (hearing specialists like herring, sardines, and anchovies).
  - 170 $dB_{RMS}$ for 48 hours for recoverable injury
  - 158 $dB_{RMS}$ for 12 hours for TTS (Temporary Threshold Shift, or complete recovery of hearing loss)
- There is no direct evidence for mortality or potential mortal injury for continuous noise
- There are no continuous noise thresholds set for fish without swim bladders (e.g. sculpins) or those with bladders that are not involved in hearing (e.g. salmonids), both of which are hearing generalists.

Data for how continuous sound affects fish, particularly dredging, is limited. In the technical report of sound exposure guidelines prepared by Popper et al. (2014), they rank the level of risk of injury as high, moderate, or low for most categories of fish instead of presenting number thresholds for harm. According to Popper, the risk of mortality for continuous sound such as clamshell and hydraulic dredging is low for all categories of fish at all distances from the sources of sound; the risk of recoverable injury is also low except for fish with a swim bladder used for hearing (hearing specialists). Below is an analysis for the two different dredging methods:

*Clamshell Dredging Noise:* Measurements of noise levels from clamshell dredging in the Snohomish River were as high as 164 dB re µP ($dB_{peak}$) and 164 $dB_{RMS}$ when the bucket hit the bottom (Pentec Environmental 2010). Another study in Cook Inlet recorded a peak sound level of 124 dB re µP ($dB_{peak}$) when the clamshell bucket hit a coarse substrate bottom (Dickerson et al. 2001). It is likely that the $_{RMS}$ noise levels for this study were lower than the peak noise levels, although they were not disclosed. This Cook Inlet study also found that softer substrates are more effective at absorbing sound from the impact of the dredge bucket, and the peak sound measurements in these softer substrates did not exceed thresholds for continuous sound. The sound levels generated in the Snohomish River study do exceed the NMFS harassment (all fish) and Popper TTS (fish with swim bladders used for hearing) thresholds, but no injury thresholds for fish. The 2018 BiOP issued to USACE for eight maintenance dredging projects, which included Keystone Harbor, noted a bucket strike from a clamshell dredge as 169 $dB_{RMS}$ and bucket dredge engines as 167 $dB_{RMS}$ (NMFS 2018). These levels are below injury thresholds for all fish, but above harassment thresholds for all fish and TTS thresholds for fish with swim bladders involved in hearing.

[3] Decibels root mean square over a period of time
[4] Decibels sound exposure level over a 24-hour period (cumulative)
[5] Injury thresholds are based on pile driving (pulsed noise)
[6] Peak sounds in decibels

*Hydraulic Dredging Noise:* Studies have shown that pipeline cutterhead dredges have a source level at 1 meter of 172-185 dB re 1uPa $_{RMS}$ (CEDA 2011). A second study found sounds from hydraulic dredging peaking at 100-110 dB and they were inaudible roughly 500 meters from the source (Clarke 2002). Monitoring for noise generated from a hydraulic dredge in the Snohomish River usually hovered around 155-160 $dB_{RMS}$, but peaked to the upper 170s when the spuds were placed (SAIC and RPS Evans Hamilton 2011).The sound levels generated in the Clark study do not exceed the NMFS or the Popper thresholds. The sounds levels from the Snohomish study exceed the NMFS harassment thresholds for all fish and the Popper thresholds for TTS and recoverable injury for fish with swim bladders involved in hearing. The sound levels cited in the CEDA paper exceed the NMFS harassment thresholds for all fish and injury thresholds for fish less than two grams, and the Popper thresholds for recoverable injury and TTS thresholds for fish with swim bladders involved in hearing. Higher noise levels are related to larger dredges and coarser and/or more consolidated substrate, and the CEDA paper does not state either of these variables. A 2018 BiOP issued to USACE for eight maintenance dredging projects, which included Keystone Harbor, considered noise associated with the hydraulic dredge cutterhead as 150 $dB_{SEL}$ and a hydraulic dredge engine as 165 $dB_{SEL}$ (NMFS 2018). These levels are below injury thresholds for all fish, but above harassment thresholds for all fish and TTS thresholds for fish with swim bladders involved in hearing.

*Summary of Noise Impacts:* The fish that would be most vulnerable to the physical and physiological effects of noise generated by clamshell and hydraulic dredging would be herring, sardines, and anchovies because they are hearing specialists (Hastings and Popper 2005). These species, particularly herring, are a common marine forage fish in Puget Sound. Both types of dredging have the potential to exceed the Popper thresholds for fish with swim bladders involved in hearing. Behavioral responses of all fish (regardless of hearing type) via harassment could occur since there is potential for the sound levels to exceed the NMFS threshold of 150 $dB_{RMS}$, but these impacts would be temporary and fish are likely to avoid the area. Regardless, the impacts of noise on fish would be insignificant at the population level since there is a finite community of fish that would be affected within the limited confines of Admiralty Bay, and there is already higher levels of ambient noise from ferry traffic. The number of the affected individuals near the dredging would be minimal compared to communities in Admiralty Bay.

**Beach Placement**

Placement of 50,000 cy per dredge event as beach nourishment would maintain a higher, more gently graded beach profile than the No-Action Alternative, and would maintain the range of intertidal elevations necessary to support the epibenthic invertebrates that serve as prey for a wide variety of marine fishes. Placement of materials would temporarily adversely affect epibenthic prey organisms, particularly gammarid amphipods, within and adjacent to the two-acre beach nourishment footprint. Amphipods are mobile epifauna that are adapted to heavy disturbance regimes, and are expected to recolonize the nourishment area to previous population levels within a few months. Furthermore, NOAA-sponsored studies have shown that the epibenthic fauna that would likely be affected by material placement do not appear to constitute a significant fraction of the forage fishes' diets, as they tend to rely more on pelagic organisms (Simenstad et al. 1977). The small scale of mortality effects that may result from the proposed project is not likely to affect amphipod population dynamics in the project area. Placement of the nourishment materials would primarily occur above the waterline so as not to directly interfere with fish usage of beach habitat. No documented forage fish spawning beaches occur in the project area (WDFW 2019). Beach nourishment would occur after the end of the juvenile salmonid outmigration period, limiting direct effects to individual fish. This schedule would allow for maximum recovery of the epibenthos prior to the following salmonid outmigration period, diminishing project effects to the prey base.

In general, it is thought that adult fish are less vulnerable than juveniles to the effects of dredging (Simenstad 1990). Most fish are likely to avoid the dredge and its impact area, and its effects on them are expected to be minimal. In addition, dredging would occur during the in-water work window of 16 July to 15 February to avoid impacts to juvenile salmonids and forage fish spawning in the area. Given that fish would avoid the dredge, the low likelihood that noise injury thresholds would be exceeded, and only temporary impacts to water quality and prey base, this alternative would not have significant effects to these fish communities.

#### *3.3.6.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

The environmental effects of dredging 50,000 cy on fish populations would be nearly identical to the effects of the clamshell dredging described in Alternative 2. There would be no impacts to fish at the beach disposal location. There would be additional impacts associated with the transport of the materials to the disposal site, including elevated noise from the barge engine and interruption of foraging/migration behavior of animals within the path of the barge.

Impacts to fish communities at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.6.4 Cumulative Impacts of the Preferred Alternative*

As stated previously, there are diverse and healthy fish communities surrounding the project. Other than the infrequent maintenance dredging, the presence of the jetty, and the occasional recreational fishing activities, there are not any other activities in the surrounding areas that would substantially affect fish communities. Given the lack of other activities and the minor and temporary nature of the project impacts, cumulative impacts to benthic invertebrates would be insignificant.

### 3.3.7 Wildlife

Waterfowl use Lake Crockett and Keystone Harbor throughout the year, though peak abundance occurs during fall migration. Raptors are common along the shores of Lake Crockett, while shorebirds are numerous during fall migration (August to October). In 2016, 82 pairs of bald eagles were recorded nesting on the island (WhidbeyCamanoIslands.com 2016). Diving birds such as cormorants, common murres, grebes, and many others are common in the waters of Puget Sound. The WDFW priority habitat database lists Admiralty Bay for shorebird and waterfowl concentrations (WDFW 2019b).

Many species of marine mammals are found in Puget Sound, with Admiralty Inlet being the migration corridor between the Strait of Juan de Fuca/San Juan Islands and Puget Sound proper. Various cetaceans (whales, dolphins, porpoises) and pinnipeds (seals and sea lions) inhabit the waters in and around Admiralty Inlet. The most common are harbor seals, but gray whales, humpback whales, killer whales, sea lions, river otters, and harbor porpoises are regularly observed, and sea otters and Dall's porpoises are occasionally observed. Gray whale sightings are common, as they feed on ghost shrimp off the shoreline (WhidbeyCamanoIslands.com 2016). The most recent sighting of a gray whale in Admiralty Inlet was August 22, 2019. The most recent humpback signting was September 17, 2019 (Orca Network 2019).

Two eco-types of killer whales occur in the greater Puget Sound: southern residents (salmon eating) and transients (marine mammal eating) (Osborne 1998). Both forage and migrate off the west side of Whidbey Island. Although residents are observed in the greater Puget Sound year-round, including the waters surrounding the San Juan Islands, they are most likely to occur from early spring through late fall when they pursue Chinook and chum salmon runs (Kreite 2007). From 1990 to 2013 there were 448 sightings of southern resident killer whales in Admiralty Inlet during the months of July through February (the in-water work window), 74 of which were in Admiralty Bay. Sightings were the highest during the months of October through December, when they migrate south into Puget Sound proper in pursuit of fall

Chinook and chum salmon runs (Osbourne 1999 and Olsen 2014). Transient killer whales have a less predictable occurrence in Puget Sound, but when present they prey on harbor seals, porpoises, sea lions, and gray whales. In May of 2019, a group of 4 transient orcas were observed feeding on a gray whale off Whidbey Island (KOMO News 2019). There are numerous observations of transient killer whales off the shoreline of Whidbey Island, the most recent on December 29, 2019 (Orca Network 2019).

#### *3.3.7.1 Alternative 1 – No Action Alternative*

There would be no impacts to wildlife associated with this alternative.

#### *3.3.7.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

***Birds***

There may be temporary impacts to birds in the vicinity of the project due to elevated turbidity and noise, and potential impacts to their prey base. They are anticipated to avoid the work area and forage in the remainder of the Admiralty Bay or nearby where there is no disturbance. Little is known about how underwater noise affects diving birds. Diving birds near regular sources of noise, such as the ferry terminal, may be habituated to the sounds; diving birds near the Ballard Locks, located in central Puget Sound, show no effects or alternations in behavior (University of Maryland 2000). The first measurements of underwater auditory thresholds for diving birds were measured on long-tailed ducks. They responded to high intensity stimuli greater than 117 dB (Therrien 2014). For marbled murrelets the U.S. Fish and Wildlife Service (USFWS) uses 150 dB $_{RMS}$ as a "guideline" for where to consider exposure to continuous sounds and the potential behavioral responses that exposure within that area would cause (E. Teachout, USFWS, pers. comm, Dec 27, 2017). Note this threshold is below the noise levels in the literature cited in section 3.3.6.2, with the exception of one hydraulic dredging study. Given the differences in physiology and behavior of diving birds, it is hard draw conclusions from the limited data, but it seems that the most likely consequences of the dredging noise would be avoidance of the area initially, with potential return of the birds to regular behavior as they become accustomed to the noise.

Forage fish, a prey item of many marine birds, may be affected by the dredging and placement of materials. This is particularly true for sand lance, which burrow in the sediment, but recolonization would occur from nearby populations in Admiralty Bay. Other species, like herring and anchovy, are pelagic and can avoid the area of disturbance. No long-term, significant impacts to bird populations are anticipated.

***Marine Mammals***

The most likely impact to marine mammals from this alternative is due to the underwater noise generated by the dredging process. The National Marine Fisheries Service (NMFS) has provided technical guidance on the effects of underwater noise on the hearing of marine mammal species. The hearing ranges and acoustic thresholds at which marine mammals are predicted to experience changes in hearing due to non-impulsive anthropogenic underwater noise, such as dredging, are summarized in Table 5. There are different thresholds for temporary (TTS) and permenant threshold shifts (PTS) of hearing sensitivity. For non-impulsive sounds, the thresholds are presented using the cumulative sound exposure level ($SEL_{cum}$) (NMFS 2016) listed in the table below.

**Table 6. Generalized Hearing Ranges, PTS, and TSS Thresholds for Non-impulsive Sounds**

| Hearing Group | Generalized Hearing Range | PTS[7] Onset Thresholds (received level) | Weighted TTS[8] onset Thresholds ($SEL_{cum}$) |
|---|---|---|---|
| Low frequency (LF) cetaceans (baleen whales) | 7 Hz to 35 kHz | $L_E$,LF,24h: 199 dB | 179 dB |
| Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales) | 105 Hz to 160 kHz | $L_E$,MF,24h: 198 dB | 178 dB |
| High-frequency cetaceans (true porpoises, *Kogia*, river dolphins, cephalorhynchid, *Lagenorhynchus cruciger* & *L. australis*) | 275 Hz to 160 kHz | $L_E$,HF,24h: 173 dB | 153 dB |
| Phocid pinnipeds (PW) (underwater) (true seals) | 50 Hz to 86 kHz | $L_E$,PW,24h: 201 dB | 181 dB |
| Otariid pinnipeds (PW) (underwater) (sea lions and fur seals) | 60 Hz to 39 kHz | $L_E$,OW,24h: 219 dB | 199 dB |

NMFS 2016. In the PTS column, $L_E$ is the cumulative sound exposure level, other abbreviations, like LF, represent the auditory weighting function for that group of marine mammals, and the accumulation period is 24 hours.

The literature cited in section 3.3.6.2 suggests a clamshell dredge can generate noise up to 164 $dB_{RMS}$, and hydraulic dredge can generate up to 185 $dB_{RMS}$. Note that these noise units are not the same as the thresholds listed in Table 5. The 185 $dB_{RMS}$ comes from CEDA (2011), which does not describe any of the conditions under which the measurements were taken (i.e. substrate, dredge size). There is no simple way convert the noise units in the literature to the NMFS threshold units without having the raw data. A 2018 BiOp issued to USACE for eight maintenance dredging projects, which included Keystone Harbor, assumed $dB_{RMS}$ and $dB_{SEL}$ to be equal for continuous noise. The BiOp also noted that noise associated with the hydraulic dredge cutterhead as 150 $dB_{SEL}$ and a hydraulic dredge engine as 165 $dB_{SEL}$, and bucket strike from a clamshell dredge as 169 $dB_{RMS}$ and bucket dredge engines as 167$dB_{RMS}$ (NMFS 2018). These noise levels are below TTS and PTS onset thresholds for marine mammals that occur in the region, with the exception of the TTS onset threshold for harbor and Dall's porpoises. Behavioral changes from noise avoidance are the most likely impacts to marine mammals. Harbor porpoises are common in Puget Sound, but are quite shy and known to quickly disappear at the sound of boat engines (Osbourne et al. 1988). Diederichs et al. 2010 observed harbor porpoises exhibiting short-term avoidance behavior when exposed to dredging. Dall's porpoises are less common but are known to approach boats and ride in the wake (Jefferson 2008), and are thus likely acclimated to noise disturbance. Since Keystone Harbor hosts a ferry terminal with regular service throughout the day, marine mammals are likely acclimated to intermittent elevated noise. A study conducted by Washington State Department of Transportation (WSDOT) measured sound near Keystone Harbor as high as 148 dB, which was attributed to ferry traffic and cargo ships (Laughlin 2015). Another study found the ferry generated a sound pressure level of 179 dB re 1 µPA measured at a distance of 1 meter (Bassett 2010). This periodic noise is louder than the dredge vessels, so it is possible that marine mammals are already avoiding the area due to this frequent noise disturbance, or else they may be accustomed to frequent, loud marine traffic across and along the shipping channel that transects Admiralty Inlet. The dredging would cease whenever the ferry needs to dock at the terminal, so there would never be both ferry and dredge vessels causing noise disturbance at

[7] Permanent threshold shift, considered auditory injury
[8] Temporary threshold shift, considered recoverable hearing loss

the same time. Given most literature on dredging suggests lower noise levels generated from dredging activities than noise levels from the ferry, no long-term physical damage to marine mammals is expected to result from the proposed action.

In addition to underwater noise generated by dredging directly affecting marine mammals, noise may also cause the displacement of food sources, such as fish, that are avoiding the work area. Marine mammals themselves are anticipated to avoid the work area, and any impacts are likely to be temporary with normal behaviors resuming once the project is completed. No long-term significant impacts to marine mammal populations are anticipated.

#### *3.3.7.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Noise impacts to marine mammals from the dredging to marine birds and mammals from dredging would be the same as those described for Alternative 2. There would be additional impacts associated with the transport of the materials to the disposal site, including elevated noise from the barge engine and interruption of foraging/migration behavior of animals within the path of the barge. As with the noise impacts associated with dredging, marine birds and mammals are likely to avoid the area surrounding the barge. Vessel strikes of marine mammals occur rarely, particularly to large baleen whales like gray whales and humpbacks, although it is highly unlikely.

Impacts to wildlife at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.7.4 Cumulative Impacts of the Preferred Alternative*

There are numerous factors that have contributed to population trends of marine mammals in Puget Sound and its adjacent waters including fishing practices, land use, vessel traffic and noise, contaminants, and the Marine Mammal Protection Act. Some marine birds and mammals have increased in numbers, while others have declined to the point of requiring listing as threatened or endangered. Cumulative impacts from the proposed actions would arise largely if there are other noise generating activities and/or other construction activities occurring at the same time. Other than the ferry operation, this is unlikely given the area is surrounded by the parks and a historic reserve. Given the lack of other activities and the minor and temporary nature of the project impacts, cumulative impacts to benthic invertebrates would be insignificant.

### 3.3.8 Aquatic Vegetation

Limited aquatic vegetation occurs in the project area. USACE created this artificial basin in 1947-48 and has been dredging it routinely over the past 50 years; therefore, almost no bull kelp (*Nereocystis luetkeana*) or eelgrass (*Zostera marina*) can grow in all of Keystone Harbor. In addition, the daily ferry movements in and out of the harbor likely limit vegetation growth by regularly suspending sediments from the propeller wash. The non-dredged aquatic areas of Keystone Harbor are largely covered in macroalgae with the dominant species being sugar kelp (*Laminaria saccharina*); however, the navigation channel itself is sparsely covered with small red algae species. Immediately offshore of the beach nourishment area at Keystone Spit is a bed of bull kelp (WDNR 2001).

#### *3.3.8.1 Alternative 1 – No-Action Alternative*

The No-Action Alternative may allow a more stable and dense community of aquatic vegetation or macroalgae communities within the harbor. The likely increase in sugar kelp may serve to host more species in the nearshore area.

#### *3.3.8.2 Alternative 2 – Maintenance Dredging With Beach Nourishment*

Effects of dredging on the sparse vegetation in the channel would be to limit the to the depths that could host aquatic vegetation. Placement of materials at the beach site would not be expected to have a measurable effect on the bull kelp bed offshore of Keystone Spit for two reasons. First, the nourishment material would be placed upon the beach that backs the kelp bed during the summer, fall, and winter months. This avoids the spring months when algae are most vulnerable to sediment effects when increasing light levels trigger reproduction. Second, the nourishment materials would be a coarse grain size and are not expected to remain suspended in the water column. This reduces the chance for sub-threshold light levels that could affect macroalgae growth rates or reproductive cycles. In addition, Corps SCUBA studies during and after previous dredging and disposal activities revealed little to no effect on aquatic vegetation near the disposal area (Smith 1976). Although the quantity proposed is greater than the 31,000 cy placed in 1976, dispersal of the material would be complete before the spring growth period of bull kelp.

#### *3.3.8.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Effects of dredging would be the same as that described for Alternative 2. However, there would be no impacts at the beach disposal site. Disposal at the PSSDA open water site would have no impacts to vegetation, as it lies at depths where there is no aquatic vegetation.

#### *3.3.8.4 Cumulative Impacts of the Preferred Alternative*

Both dredging and placement would have temporary impacts to the vegetation. A net benefit would result from sediment along a section of shoreline that has had its sediment input cut off by man-made structures, thereby creating a beach profile that supports marine vegetation. Past actions have changed the marine vegetation patterns; it is likely that kelp fronted the area where Keystone Harbor exists given bull kelp beds exist on both sides of the entrance. No other ongoing activities impact these kelp beds. Understory kelp and algae in the harbor continues to tolerate ferry propeller wash. Dredging would remove any that exists within the project footprint, but these communities are expected to recolonize by the next growing season. Significant cumulative impacts of past shoreline modifications and current ferry activities combined with the proposed dredging and placement are not anticipated.

### 3.3.9 Threatened and Endangered Species

Nine species protected by the Endangered Species Act (ESA) of 1973, as amended, may occur near Keystone Harbor. In accordance with Section 7(a)(2) of the Act, federally funded, constructed, permitted, or licensed projects must take into consideration effects to federally listed, proposed, and candidate species. Table 1 is a list of ESA-listed species that may occur near Keystone Harbor.

**Table 7. Endangered and Threatened Species Potentially Occurring near Keystone Harbor**

| Species common name | Scientific Name | Listing Status | Critical Habitat |
|---|---|---|---|
| Coastal/Puget Sound Bull Trout | *Salvelinus confluentus* | Threatened | Designated |
| Marbled Murrelet | *Brachyramphus marmoratus* | Threatened | Designated |
| Puget Sound Chinook Salmon | *Oncorhynchus tshawytscha* | Threatened | Designated |
| Hood Canal Summer Chum Salmon | *Oncorhynchus keta* | Threatened | Designated |
| Puget Sound Steelhead | *Oncorhynchus mykiss* | Threatened | Designated |
| Southern Resident Killer Whale | *Orcinus orca* | Endangered | Designated |
| Eulachon | *Thaleichthys pacificus* | Threatened | Designated |
| Bocaccio Rockfish | *Sebastes paucispinis* | Endangered | Designated |
| Yelloweye Rockfish | *Sebastes ruberrimus* | Threatened | Designated |

### *3.3.9.1 Alternative 1 – No-Action Alternative*

The No-Action Alternative would have no effect on any threatened or endangered species.

### *3.3.9.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

The USACE submitted a Combined-Projects Biological Assessment (BA) for maintenance dredging, of which this dredging action is one component, to NMFS and USFWS (the Services). USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with all of USACE's effects determinations of NLAA. Below is a table summarizing the Services' effects determinations:

**Table 8. Summary of NMFS Effects Determinations**

| Species | Effect Determination | Critical Habitat Determination |
|---|---|---|
| Coastal/Puget Sound Bull Trout | Not likely to adversely affect | Not likely to adversely affect |
| Marbled Murrelet | Not likely to adversely affect | None present in action area |
| Puget Sound Chinook Salmon | Likely to adversely affect | Likely to adversely affect |
| Hood Canal Summer Chum Salmon | Not likely to adversely affect | Likely to adversely affect |
| Puget Sound Steelhead | Likely to adversely affect | Likely to adversely affect |
| Southern Resident Killer Whale (SRKW) | Not likely to adversely affect | Not likely to adversely affect |
| Eulachon | Likely to adversely affect | None present in action area |
| Bocaccio Rockfish | Not likely to adversely affect | Likely to adversely affect |
| Yelloweye Rockfish | Not likely to adversely affect | Not likely to adversely affect |

NMFS did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018 (see Appendix A).

Construction would occur when Puget Sound Chinook, Hood Canal summer-run chum, and Coastal/Puget Sound bull trout are least likely to be present in the action area. The work timing is outside of the USFWS closure period for bull trout in Puget Sound marine waters (16 February to 15 July), the NMFS closure period for Chinook in Puget Sound marine waters (1 March to 1 July), and the NMFS closure period for Hood Canal chum in marine waters (1 March to 15 July). In addition to avoiding work closure windows, USACE would set aside all beach logs from the beach nourishment site and redistribute the woody debris after the dredge materials have been placed on the beach site. Impacts to ESA-listed salmonids, eulachon, and rockfish are the same as those described in 3.3.6, and include potential entrainment, exposure to elevated noise and turbidity, and temporary reduction in prey base.

Impacts to marbled murrelet and SRKW are the same as those described in section 3.3.7, including exposure to elevated noise and potential short-term impacts to prey resources.

Overall, impacts to ESA-listed species are not expected to be significant.

### *3.3.9.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

The environmental effects of dredging to ESA-listed species would be identical to effects of Alternative 2.

Impacts associated with the transport of materials to the disposal sites would be similar to those described for fish and wildlife. Impacts to Threatened and Endangered Species at the open water disposal sites are

addressed in a 2015 PSDDA BiOp. In 2015, USACE submitted a BA for ESA consultation for the DMMP disposal sites. The USACE received a Biological Opinion on 17 December 2015 from NMFS and a letter of concurrence on 28 July 2015 from USFWS for the DMMO disposal sites.

#### *3.3.9.4 Cumulative Impacts of the Preferred Alternative*

Cumulative impacts to ESA listed species are the same as those described in sections 3.3.6.4 and 3.3.7.4. USACE does not anticipate significant cumulative impacts.

### 3.3.10 Cultural Resources

A cultural resources assessment was performed by a professional archaeologist to determine potential to cause effects to Historic Properties if they should exist within the project area. A search of the archaeological and historic site records at the Washington State Department of Archaeology and Historic Preservation (DAHP) indicated that the proposed project lies within the southern boundary of the National Park Service (NPS) administered "Ebey's Landing National Historical Reserve" (45IS04H; a.k.a "Central Whidbey Island Historic District"). The Historical Reserve is listed on both the Washington Heritage Register (WHR) and the National Register of Historic Places (NRHP). The project is within the boundaries of the Washington State Parks administered Fort Casey State Park (45IS103H), which contains structures that are components of the Historical Reserve. A comprehensive review of the prehistory and history of the historical reserve can be found on the NPS web site at: http://www.nps.gov/ebla/index.htm

In 2006, a Corps archaeologist conducted a pedestrian archaeological survey of the shoreline and adjacent areas during a minus tide, as well as a study of viewsheds to and from the nearest historic properties. The archaeological survey produced no evidence of prehistoric-period activity within or closely adjacent to the project's area of potential effect (APE). USACE determined that the 2006 maintenance project had a finding of No Historic Properties Adversely Effected, as well as previous dredging actions dating back to 1948.

#### *3.3.10.1 Alternative 1 – No-Action Alternative*

The No-Action Alternative would have no effect on any cultural resources.

#### *3.3.10.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

The proposed action is a routine maintenance task that was surveyed in 2006 with a finding of No Historic Properties Adversely Affected, and all ground disturbing activity would occur within previously disturbed and surveyed maintenance areas; therefore, USACE has determined that the project has No Potential to Cause Adverse Effects to Historic Properties under the NHPA. Furthermore, there are no historic structures adjacent to the undertaking, and the work would not affect immediate viewsheds that are eligible for the National Register.

If, during construction activities, the contractor observes items that might have historical or archeological value, such observations shall be reported immediately to the Contracting Officer so that the appropriate authorities may be notified and a determination can be made as to their significance and what, if any, special disposition of the finds should be made. The contractor shall cease all activities that may result in the destruction of these resources and shall prevent employees from trespassing on, removing, or otherwise damaging such resources.

#### *3.3.10.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

The maintenance dredging with open water disposal alternative would still have no potential to adversely affect cultural resources at the dredging location. The same protocol for the contractor would apply as described in Alternative 2.

Impacts to cultural resources at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.10.4 Cumulative Impacts of the Preferred Alternative*

Since no cultural resources have been identified within the project APE, no cumulative impacts are expected.

### 3.3.11 Indian Trust Assets

The Federal government must consider the effects its actions may have on American Indian trust resources, traditions, and cultural practices. The Federal basis of a tribe's legal status rests within the context of U.S. Constitutional provisions for Federal government's powers for treatymaking with other sovereign nations, and American Indian tribes' inherent sovereignty. Numerous tribes in the Puget Sound area are parties to treaties with the U.S., which reserve lands and rights to the tribes. One of the treaty-reserved rights is the ability to take fish at all places where the tribe fished at treaty time, commonly referred to as "Usual and Accustomed" (U&A) locations. Tribal fisheries are central to the cultural and economic existence of tribes and their members. Treaty terms and the rights arising from them cannot be rescinded or canceled without explicit Congressional consent. Federal agencies, including the Corps, have a legal obligation to abide by treaty terms and to avoid interference with treaty-reserved fishing rights. The following tribes have Usual and Accustomed fishing rights in the project area:

- Lummi Nation
- Jamestown S'Klallam Tribe
- Port Gamble S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Skokomish Tribe
- Suquamish Tribe
- Swinomish Tribe
- Tulalip Tribe

#### *3.3.11.1 Alternative 1 – No Action Alternative*

This alternative would have no impact on Indian trust assets.

#### *3.3.11.2 Alternative 2 – Maintenance Dredging With Beach Nourishment (preferred alternative)*

USACE would avoid interference with treaty fishing rights by performing dredging operations at times that do not conflict with Indian fishing activities. Through coordination prior to each dredging event, USACE works closely with the tribes to ensure that maintenance dredging activities do not interfere with tribal fisheries. Working within the designated in-water work window avoids the peak outmigration period of sensitive juvenile salmonids and therefore minimizes impacts to juveniles and the associated tribal salmon fishery for future years. USACE sent letters to the affected tribes listed above on 12 November 2019 soliciting their comments and concerns. No responses have been received to date.

#### *3.3.11.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Impacts to Indian trust assets would be the same as those described for Alternative 2, although there would be no impacts from disposal at the beach site. As with dredging, transport and disposal at the open-water site would be coordinated with the tribes.

Impacts to tribal trust assets at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.11.4 Cumulative Impacts of the Preferred Alternative*
Because impacts to tribal fishing would be avoided, no cumulative impacts are anticipated.

### 3.3.12 Recreation
The Keystone Spit dredged material disposal area is located in Fort Casey State Park. The park provides over 460 acres of recreational lands, including more than two miles of saltwater shoreline along Admiralty Inlet and Admiralty Bay (Washington Parks 2005). The park was incorporated into the Ebey's Landing National Historic Reserve in 1980, but is managed by Washington State Parks and Recreation Commission.

The park provides facilities for camping, picnicking, and hiking, as well as two boat ramps. Major park attractions include an underwater dive park, the Admiral Head Lighthouse and interpretive center, and historic bunker structures from the coast artillery post built at the site in the late 1800s. The Fort Casey underwater park is located immediately waterward of the dredged material disposal site. It is an easily accessible training site popular with divers from western Washington and southwestern British Columbia. The Keystone Jetty feature of the Federal navigation project is one of two dive sites within the park. The jetty stones are home to large anemones, starfish, urchins, barnacles, and tubeworms. Giant Pacific octopus and wolf eels occur at the jetty site (USACE 1981).

#### *3.3.12.1 Alternative 1 – No-Action Alternative*
Continued erosion could limit access to the jetty, which is a popular feature with anglers and other park recreators. In addition, beach erosion could eventually damage the recreational boat launch as well as the State Park parking area and other infrastructure.

#### *3.3.12.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*
This alternative would allow for continued ferry operations with continued use by recreators transiting to and from Whidbey Island. Beach maintenance would cause short-term closures of a small section of beachfront in the placementarea during construction, but would allow for long-term public access to the beach and boat launch. The beach nourishment would help protect access to the jetty, a popular feature for SCUBA divers and anglers. The dive park would remain open during dredging and beach nourishment.

#### *3.3.12.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*
Impacts to recreation would be the same as those described for Alternative 2, although there would be no impacts from disposal at the beach location. As described for Alternative 1, no action, without disposal at the beach continued erosion could limit recreation at the jetty and boat launch.

Impacts to recreation at the open water disposal sites are addressed in the aforementioned PSDDA Phase 2 EIS.

#### *3.3.12.4 Cumulative Impacts of the Preferred Alternative*
Impacts of the proposed action to recreation would temporary with a long-term benefit. It is unlikely that other construction activities would occur at the same time that would also impact recreation. Therefore, no cumulative impacts are anticipated.

### *3.3.13* Utilities and Public Services
The utilities and public services in and near Keystone Harbor include the WSDOT Port Townsend/Coupeville ferry route, State Highway 20, Fort Casey State Park and its associated recreation opportunities, and a boat launch.

#### *3.3.13.1 Alternative 1 – No-Action Alternative*

The No-Action Alternative would limit navigation access to Keystone Harbor, primarily WSDOT ferry access, and would likely lead to cancellations of the Port Townsend/Coupeville ferry run. Continued erosion of the beach adjacent to the harbor could result in damage to the State Park facilities and potentially damage State Route 20 if left unmitigated.

#### *3.3.13.2 Alternative 2 – Maintenance Dredging with Beach Nourishment (preferred alternative)*

Maintenance of the navigation channel would allow continued, safe access for the WSDOT ferry. In addition, recreational features including the restrooms, picnic area, parking lot, and boat launch facilities of Fort Casey State Park would be preserved by the use of dredge material as beach nourishment.

#### *3.3.13.3 Alternative 3 – Maintenance Dredging with Open Water Disposal*

Effects to utilities and public services would be the same as for Alternative 2 in that all features, facilities, and services would be preserved. No impacts to utilities and public services are expected from disposal at the open-water site.

#### *3.3.13.4 Cumulative Impacts of the Preferred Alternative*

Impacts of the proposed action would be beneficial, and it is unlikely other construction activities would occur at the same time that would also affect utilities and public services. Therefore, no cumulative impacts are anticipated.

# 4 MITIGATION

No compensatory mitigation is proposed for this action as no loss of wetlands, no jeopardy to ESA-listed species, and no significant impacts to commercially important species are anticipated to occur based on the analyses in this document. The USACE would implement several avoidance and minimization measures to ensure impacts are no greater than minimal, short-term effects. The primary measures to minimize impacts are the timing of in-water work and location of dredged material placement. Dredging would only occur within the allowed in-water work window for the protection of juvenile salmon. A secondary measure is to dredge as infrequently as possible. The shoaling rate for the past several decades has necessitated sediment removal every 7 to 12 years. Dangerous conditions develop when the waterway is dredged less frequently and becomes too shallow for the larger vessels. The proposed action includes several measures that would avoid and minimize adverse effects:

1) Barges used to transport the dredged material to the placement site or transfer sites would not be filled beyond their capacity, would maintain seals, and would completely contain the dredged material.
2) Clamshell dredging operations are conducted in a manner that minimizes spillage of sediments from the dredge bucket and transport barge to minimize effects to water quality.
3) Hydraulic-type dredge operators would minimize pump operations when dragheads and/or cutter heads are above the substrate.
4) The USACE would conduct dredging operations during the prescribed work window of 16 July through February 15. If this cannot be done due to extenuating circumstances, then the USACE would notify the Services and Washington Department of Ecology (WDOE) and re-consult if necessary.
5) No work would occur during the spring months when macroalgae are most susceptible to harm from increases in turbidity.

6) Maintenance dredging would be conducted based on the results of site-specific hydrographic condition surveys conducted for the year of dredging.

7) A water quality monitoring plan has been developed that is consistent with the conditions and adheres to applicable criteria issued in the WQC from WDOE associated with disposal of dredged material into the waters of the U.S. (Appendix F) and the terms and conditions in the NMFS Biological Opinion (BiOp B). USACE would adhere to all criteria and conditions in the WQC and BiOp, including turbidity monitoring.

8) The dredge operator would adhere to the methods and criteria in the water quality monitoring plan.

9) The USACE would coordinate with the local Indian tribes that have usual and accustomed fishing rights in the project area.

10) Dredge operators would limit the dredge prism and the volume of removed sediment to the authorized channel and minimum area necessary to achieve project goals.

11) All easily accessible large woody material at the placement site would be moved, temporarily stockpiled, and replaced on the beach at the conclusion of the project

12) All dredged material would be beneficially used as beach nourishment.

13) All work would be coordinated with Fort Casey State Park to limit effects to recreation activities.

14) The recreational diving site would be protected from sedimentation.

# 5 COORDINATION

The following agencies and entities were contacted regarding this project:

- Washington Department of Transportation (Washington State Ferries)
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- Lummi Nation
- Jamestown S'Klallam Tribe
- Port Gamble S'Klallam Tribe
- Skokomish Tribe
- Suquamish Tribe
- Swinomish Tribe
- Tulalip Tribe
- Samish Tribe
- Upper Skagit Tribe
- Sauk-Suiattle Tribe
- Washington Department of Fish and Wildlife
- Washington Department of Ecology

# 6 ENVIRONMENTAL COMPLIANCE

USACE has analyzed the environmental effects of the alternatives and the following sections describe how the preferred alternative complies with pertinent environmental laws and executive orders.

## 6.1 National Environmental Policy Act (NEPA) (42 U.S.C.§ 4321 et seq.)

In accordance with NEPA, Federal agencies are required to declare the potential environmental effects of their projects and to solicit public comment. The purpose of this document is to solicit public comment and fulfill USACE's documentation requirements under NEPA. A 30-day public comment period will be held from February 4 to March 4, 2020. A draft Finding of No Significant Impact/Statement of Findings (FONSI/SOF) can be found in Appendix B.

## 6.2 Endangered Species Act of 1973, as Amended (16 U.S.C.§§ 1531-1544)

In accordance with Section 7(a)(2) of the ESA of 1973, as amended, (16 U.S.C. §§ 1531-1544) federally funded, constructed, permitted, or licensed projects must take into consideration effects to federally listed or proposed threatened or endangered species. The USACE submitted a Combined-Projects Biological Assessment (BA) for maintenance dredging, of which this dredging and placement action is one component, to NMFS and USFWS (the Services). USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with all of USACE's effects determinations of NLAA, but did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018 (see Appendix A).

## 6.3 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act requires Federal agencies to consult with NMFS regarding actions that may adversely affect Essential Fish Habitat (EFH) for groundfish, coastal pelagic species, and three species of Pacific salmon. An EFH determination for the maintenance dredging of the Keystone Harbor was included in the Combined Project BA submitted to NMFS. The USACE has determined that maintenance dredging may adversely affect EFH for the entire maintenance dredging program, including Keystone Harbor, because removal of dredged material would constitute a detectable effect to EFH by disturbing the substrate and associated water quality impacts. NMFS concurred with this determination in a letter dated 26 January 2018 (Appendix A). NMFS listed seven conservation measures to minimize and/or avoid adverse impacts to EFH. USACE provided a detailed response to NMFS within 30 days as required by section 3.5(b)(4)(B) of the MSA that agreed with all conservation recommendations, except to return all woody debris to the waterway. For the measure regarding woody debris, standard practice is to dredge around large logs with or without root wad so that they remain in the water. Other woody debris is typically small fragments of trees, bushes, or scrap lumber, and not of the quality to be beneficially used. If this woody debris is larger than two feet in any dimension, it is separated from the dredged material and disposed of at an appropriate disposal facility. The USACE response to the EFH conservation recommendations concludes the EFH consultation requirements.

## 6.4 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. USFWS coordination is not required for maintenance work such as the proposed work.

## 6.5 Clean Water Act, as Amended (33 U.S.C. §1251 et seq.)

The Clean Water Act (33 U.S.C. §1251 et seq.) requires Federal agencies to protect waters of the United States (U.S.). The regulation implementing the Act disallows the placement of dredged or fill material into water unless it can be demonstrated there are no practicable alternatives that are less environmentally

damaging. The sections of the Clean Water Act (CWA) that apply to the proposal are 401 regarding discharges to waterways and 404 regarding fill material in waters and wetlands. USACE policies related to the CWA disallow the placement of dredged or fill material into waters of the U.S. unless it can be demonstrated disposal occurs in the least costly, environmentally acceptable manner, consistent with engineering requirements established for the project. Based on the analysis identified in this feasibility report, Alternative 2 is expected to be less costly than Alternative 3 and have less of an impact on the environment. The placement of dredged materials along the shoreline is considered a beneficial use of materials. Compliance with each of these sections of the CWA is detailed below:

Section 401
Any project that involves placing dredged or fill material in waters of the U.S. or wetlands, or mechanized clearing of wetlands requires a water quality certification from the state agency as delegated by the EPA. USACE has contacted WDOE requesting a 401 WCQ. Receipt of the WQC is pending, and will be complete upon the finalization of this EA.

Section 404
In 1972, Section 404 established a program to regulate the discharge of dredged or fill material into the navigable waters of the U.S. The fundamental principle of the program is that no discharge of dredged or fill material should be permitted if there is a practicable alternative that would be less damaging to aquatic resources or if significant degradation would occur to the nation's waters. To comply with Section 404, it is necessary to avoid negative effects to wetlands wherever practicable, minimize effects where they are unavoidable, and compensate for effects in some cases. USACE prepared a 404(b)(1) evaluation to document findings regarding this project pursuant to Section 404 of the CWA, attached in Appendix C. USACE has prepared and distributed a Section 404 public notice for public comment contemporaneous with this Draft EA. No wetlands will be affected by the project.

## 6.6 Coastal Zone Management Act (16 U.S.C. §§1451-1465)

The Coastal Zone Management Act of 1972 as amended (16 U.S.C. §§ 1451-1465) requires Federal agencies to carry out their activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state Coastal Zone Management Program. USACE prepared a Coastal Zone Management Act Consistency Determination and submitted this document to WDOE for their review and concurrence (Appendix D). Concurrence is pending will be complete upon the finalization of this EA.

## 6.7 National Historic Preservation Act (16 U.S.C. § 470 et seq.,)

The National Historic Preservation Act (16 U.S.C. § 470) requires that the effects of proposed Federal undertakings on sites, buildings structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. USACE, Seattle District has reviewed the proposed action and conducted an analysis in accordance with Section 106 of the NHPA's implementing regulations at 36 C.F.R.§ 800. Review of the proposed dredging finds that the activity would have no effect to known archaeological or cultural resources within the APE. No further archaeological work is recommended. An area of potential effect (APE) letter was prepared and sent to the SHPO for review and concurrence. USACE received concurrence on the APE from the SHPO on 3 February 2020. USACE will be sending another letter to the SHPO with a determination of "no adverse effects to historic properties" and expects a response prior to the finalization of this EA. Tribal notification letters were also sent to the Jamestown Sklallam Tribe, Lower Elwah Klallam, Lummi Nation, Port Gamble Skallam Tribe, Skokomish Tribe, Suquamish Tribe, Swinomish Tribe, and Tulalip Tribe asking if there are any properties of cultural or religious significance that would be affected by the project. Notified tribes will review and comment within 30 days. See Appendix E for SHPO letters and an example Tribal cultural resources letter.

## 6.8 Clean Air Act As Amended (42 U.S.C. § 7401, et seq.)

The Clean Air Act (CAA) as amended (42 U.S.C. §7401, et seq.) prohibits Federal agencies from approving or conducting any action that does not conform to an approved state, tribal, or Federal implementation plan. Under the CAA General Conformity Rule (Section 176(c)(4)), Federal agencies are prohibited from approving any action that causes or contributes to a violation of a NAAQS in a nonattainment area. According to 40 CFR Section 93.153 (c)(2)(ix), the requirement for a conformity determination is waived where the proposal would result in a clearly *de miminis* increase in emissions, as long as the project involves maintenance dredging and disposal operations in which no new depths are required and approved disposal sites are used. The proposed action is maintenance dredging and placement at approved sites with no new widths or depths, in an attainment area where no more than *de minimis* increase in emissions would be generated, and is therefore exempt from the requirement for a General Conformity Determination.

## 6.9 Marine Mammal Protection Act (16 U.S.C. §§ 1361-1407)

The Marine Mammal Protection Act of 1972, as amended, prohibits the taking of marine mammals by citizens of the U.S. except under certain conditions (16 U.S.C. 1361). Marine mammals can be found in Admiralty Bay and the adjacent waters. USACE has determined that the preferred alternative would not significantly disturb any marine mammal behavioral patterns (harassment or cause any harm (see section 3.3.7), and thus it is not necessary to pursue an incidental harassment authorization under the MMPA. The rationale for this determination is the following:

1. Marine mammals have the ability to avoid the area while underwater and seals and sea lions can haul out in areas nearby that are not exposed to the elevated underwater noise from dredging.
2. The noise generated by the dredging is not likely to exceed PTS or TTS thresholds for most marine mammals, and harbor and Dall's porpoises, which have lower thresholds, are likely to stay in deeper water and avoid the area during noise-generating activities.
3. Ambient underwater noise levels in the Keystone Harbor and Admiralty Bay area are already higher than unconfined and undeveloped marine areas due to ferry and boat traffic. Marine mammals are likely acclimated to these disturbances.
4.

## 6.10 Migratory Bird Treaty Act and Migratory Bird Conservation Act (16 USC 701-715)

The proposed project would be conducted in such a manner that migratory birds would not be harmed or harassed. The proposed work would be outside the nesting season for most birds. This project would not affect flow regimes or hydrology in Lake Crockett.

## 6.11 Executive Order 12898, Environmental Justice

Executive Order 12898 directs every Federal agency to identify and address disproportionately high and adverse human health or environmental effects of agency programs and activities on minority and low-income populations. Maintenance dredging would not exclude, deny benefits to, or discriminate against minority or low-income populations, nor does the project involve locating a facility that would discharge pollutants or contaminants. Therefore, the project complies with this order.

## 6.12 Executive Order 11990, Protection of Wetlands

This order directs Federal agencies to avoid to the extent possible the long and short-term adverse effects associated with the destruction or modification of wetlands and to avoid direct or indirect support of new

construction in wetlands wherever there is a practicable alternative. Maintenance dredging and disposal activities would not alter the wetlands found in and adjacent to Lake Crockett. A small amount of intertidal habitat would be filled with dredged material; however, the placed material would help maintain the typical beach profile found in the area prior to the creation of the navigation project.

### 6.13 Native American Trust Assets

In the mid-1850s, the U.S. entered into treaties with nearly all of the Native American tribes in the territory that would become Washington State. These treaties guaranteed the signatory tribes the right to "take fish at usual and accustomed grounds and stations . . . in common with all citizens of the territory" [*U.S. v. Washington*, 384 F. Supp. 312 at 332 (WDWA 1974)]. In *U.S. v. Washington*, 384 F. Supp. 312 at 343 - 344, the court resolved that the Treaty tribes had the right to take up to 50 percent of the harvestable anadromous fish runs passing through those grounds, as needed to provide them with a moderate standard of living (Fair Share). Over the years, the courts have held that this right comprehends certain subsidiary rights, such as access to their "usual and accustomed" fishing grounds. More than *de minimis* effects to access to usual and accustomed fishing area may violate this treaty right [*Northwest Sea Farms v. Wynn*, F. Supp. 931 F. Supp. 1515 at 1522 (WDWA1996)]. In *U.S. v. Washington*, 759 F.2d 1353 (9th Cir 1985) the court indicated that the obligation to prevent degradation of the fish habitat would be determined on a case-by-case basis. The Ninth Circuit has held that this right encompasses the right to take shellfish [*U.S. v. Washington*, 135 F.3d 618 (9th Cir 1998)].

A number of tribes have usual and accustomed (U&A) fishing rights in the project area, which are listed in section 3.3.11. USACE analyzed the proposed project with respect to its effects on the treaty rights described above. USACE's analysis concludes the following regarding effects to treaty rights:

(1) The work would not interfere with access to U&A fishing and gathering areas;
(2) The work would not cause the degradation of fish runs in U&A fishing grounds or with fishing activities or shellfish harvesting and habitat; and
(3) The work would not impair the Treaty tribes' ability to meet moderate living needs.

USACE notified U&A tribes within the project area (listed in section 3.3.11) in writing of the prosed action and solicited comments and concerns. USACE sent letters to these tribes on 12 November 2019 to solicit comments and identify potential conflicts with the fishing practices (see Appendix F for an example).

# 7 UNAVOIDABLE ADVERSE IMPACTS

The primary unavoidable adverse impact would be disruption of the benthic community in the Keystone Harbor and the disposal site. Invertebrate communities are likely to recover due to infrequency of dredging. Another unavoidable adverse impact would be air pollution and greenhouse gas emissions from the dredge and associated machinery. Both air pollution and greenhouse gas emissions would be small scale.

There would be some effects to water quality in the immediate vicinity of the active dredging and during dredged material disposal. Any effects to water quality would be short lived and small scale. Therefore, any effects to water quality would be insignificant. Effects to aquatic wildlife would be minimized by working during times of the year when ecologically important aquatic species (including ESA listed species) would not be in the area or in low abundance. The dredging project would not negatively affect the geomorphology of the

Keystone Marina. Noise impacts would temporarily increase due to the proposed dredging operation, but to a minor degree.

Sediment re-suspension would lead to increased turbidity in the vicinity of the dredging operation and possibly during grading of the material on the beach. However, the Dredged Material Evaluation and Disposal Procedures User Manual User Manual standards for sediment are designed to be protective of organisms that come into contact with sediments, and preliminary testing indicates that sediments suspended during dredging and disposal are below levels that may cause harm to juvenile or adult salmonids.

# 8 COMPARISON OF NO-ACTION AND PREFERRED ALTERNATIVE

Some effects to the human environment would be greater under the preferred alternative than under the no-action alternative. The atmospheric environment would continue to be indirectly affected with the preferred alternative by maintaining vessel access to the Keystone Harbor thus slightly increasing air pollution in the region. Under the no-action alternative there would be no future dredging for the next 15 years, which eventually could significantly reduce vessel access resulting in localized improved air quality.

Changes to the aquatic environment would perhaps be the most dramatic under the no-action alternative. Substrate contours in the harbor would be allowed to undergo natural changes and fauna associated with the substrate may progress to a natural, climax state. Overall this would be beneficial to the aquatic environment and any ESA listed species in the area. However, the no action alternative would significantly affect tourism and the local economy. The ferry would not be able to use the navigation channel to access Whidbey Island. The result could be fewer jobs for local people and less tourism.

The no action alternative was rejected because it does not meet the purpose and need for the project. Alternative 3, Maintenance Dredging with Open Water Disposal, was not recommended due to the excessive costs and fuel consumption and not addressing beach erosion downdrift of the jetty. The preferred alternative, Alternative 2, Dredging with Beach Nourishment, is recommended because it would fully achieve the project purpose, and has the lowest cost and fuel consumption. The preferred alternative would have greater effect on the environment than the no action alternative, but the proposed dredging project would be cost effective relative to meeting the purpose and need of the proposed project, and would provide the greatest safety for ferry and other vessel access. Although the preferred alternative (Alternative 2) would have a greater effect on the aquatic environment, work window restrictions and other minimization measures would minimize effects to the aquatic environment. Alternative 3 would have similar temporary effects to the aquatic environment, with the exception of impacts at the open-water disposal site. It would adhere to the same in-water work window.

# 9 Public Interest Evaluation Factors for Maintenance Dredging Activities

The USACE conducted an evaluation of the dredging and placement activity in light of the public interest factors prescribed in 33 CFR 336.1(c). These factors include: navigation and the Federal standard for dredged material disposal; water quality; coastal zone consistency; wetlands; endangered species; historic resources; scenic and recreation values; fish and wildlife; marine sanctuaries; and applicable state/regional/local land use classifications, determinations, and/or policies. Of these, navigation and the

Federal standard, water quality, coastal zone consistency, wetlands, endangered species, historic resources, scenic values, recreational values, and fish and wildlife have been evaluated in this EA. The factor of marine sanctuaries established under the Ocean Dumping Act has been considered; there are no sanctuary effects of dredging or placement. The factor of application of non-Federal land use policies was considered in connection with the coastal zone consistency evaluation; no additional impacts to state/regional/local land use classifications, determinations, and/or policies are anticipated because the project would maintain a federally authorized channel that is already used for vessel traffic.
In accordance with 33 CFR 337.1(a)(14) and 325.3(c)(1), the USACE considered the following additional relevant factors:

- Conservation: This action would entail maintenance dredging, and would not involve any new channel construction or change to channel depths or widths. The effects on fish and wildlife, including marine mammals and ESA-listed species, have been fully evaluated.
- Economics: As reflected in this EA, the local community relies on the availability and full utility of the channel, the use of which this action would perpetuate. The preferred alternative is the least costly alternative that would meet the project's purpose and need. The economic benefits afforded through accomplishing maintenance dredging to the authorized depths outweigh the Federal costs of the action and the costs the region would incur with an eventual return to the pre-construction conditions that would ensue under the No-Action Alternative.
- Shoreline erosion and accretion: The effects on shoreline erosion and accretion appear in the hydraulics and geomorphology section of this EA. The proposed dredging and placement would have a beneficial effect to the shoreline by preventing erosion to the point of undermining the jetty and losing park infrastructure.
- Safety: Maintenance dredging to the authorized depths and providing a navigable waterway for the safe and efficient transit of vessels serves the interests of safety.
- Property ownership: Maintaining use of the navigation channel would not affect property ownership.

As provided in 33 CFR Sections 335.4, 336.1(c)(1) and 337.6, the USACE has fully considered, on an equal basis, all alternatives that are both reasonable and practicable, i.e., available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. The necessary budget resources are available and adequate to fully support the action. The preferred alternative represents the least costly alternative, constituting the discharge of dredged or fill material into waters of the U.S. in the least costly manner and at the least costly and most practicable location. It is consistent with sound engineering practices, and meets the environmental standards established by the Clean Water Act Section 404(b)(1) evaluation process. Execution of the preferred alternative, following consideration of all applicable evaluation factors, would be in the public interest.

# 10 Summary

As described, the proposed Federal action under the preferred alternative of dredging for channel maintenance with placement of dredged materials on the adjacent beach would not have significant impacts to the environment of Keystone Harbor or the sediment placement area. Adhering to the in-water work window and limiting work to the designated project footprints is sufficient to avoid significant impacts to natural resources. USACE will pursue and complete compliance with all environmental laws including ESA, CWA and CZMA, prior to finalization of the EA and FONSI.

# 11 REFERENCES


Bassett, C. (2010). Underwater ambient noise at a proposed tidal energy site in Puget Sound, Master's thesis, University of Washington.

Central Dredging Association (CEDA). 2011. "Underwater sound in relation to dredging". Central Dredging Association Position Paper, prepared by the CEDA Working Group on Underwater Sound under the remit of the CEDA Environment Commission. Available at: https://www.iadc-dredging.com/ul/cms/terraetaqua/document/3/0/5/305/305/1/article-ceda-position-paper-underwater-sound-in-relation-to-dredging-terra-et-aqua-125-4.pdf

Clarke, D.G., C. Dickerson, and K.J. Reine. 2002. Characterization of Underwater Sounds Produced by Dredges. U.S. Army Engineer Research and Development Center. Vicksburg, MS.

Dickerson, C., Reine, K. J., and Clarke, D. G. 2001. "Characterization of underwater sounds produced by bucket dredging operations," DOER Technical Notes Collection.

Diederichs A., M. Brandt, G. Nehls.2010. Does sand extraction near Sylt affect harbour porpoises? Wadden Sea Ecosystem 26:199-203

Collins, B.D. and A.J. Sheikh. 2005. *Historical reconstruction, classification, and change analysis of Puget Sound tidal marshes.* Report to Washington Department of Natural Resources Aquatic Resources Division, Olympia, WA. Online at http://riverhistory.ess.washington.edu/research/tidal_marshes.php

Downing, J. 1983. The Coast of Puget Sound: Its Processes and Development. Puget Sound Books, Washington Sea Grant Program, University of Washington, Seattle. 126p.

Drabble, R. 2012. Projected entrainment of fish resulting from aggregate dredging. Marine Pollution Bulletin, 64, 373–381.

Hastings, M.C. 1995. Physical effects of noise on fishes. Inter-noise 95, the 1995 International congress on noise control Engineering Vol 2: 979-984.

Hastings, Mardi. 2002. Clarification of the Meaning of Sound Pressure Levels and the Known Effects of Sound on Fish. White Paper. August 2002.

Hastings, M.C., and A.N. Popper. 2005. The Effects of Noise on Fish. California Department of Transportation Contract No. 43A0139, Task Order 1.

Hawkins, A. D., Roberts, L., and Cheesman, S. 2014. Responses of free-living coastal pelagic fishto impulsive sounds. *The Journal of the Acoustical Society of America, 135*(5), 3101-3116.

Jefferson, T.A. 2008. Dall's porpoise *Phocoenoides dalli*. In: Würsig B, Perrin W, Thewissen JGM (eds) Encyclopedia of Marine Mammals (2nd ed.). Academic Press. p. 296–298.

KOMO News. 2019. Orca feeding frenzy off Whidbey Island captured whale watchers. Accessed online at: https://komonews.com/news/local/orcas-devour-gray-whale-in-stunning-attack-off-whidbey-island

Kriete, B. 2007. Orcas in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-01. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Larson, K.M. and C.E. Moehl. 1988. Entrainment of Anadromous Fish by Hopper Dredge at the Mouth of the Columbia River. In Effects of Dredging on Anadromous Pacific Coast Fishes: workshop proceedings, Seattle, September 8-9. Charles Simenstad, editor.

LaSalle, M.W. 1988. Physical and chemical alterations associated with dredging: an overview. Presentation in the 1988 "Effects of dredging on anadromous Pacific coast fishes" workshop, Sponsored by Wetland Ecosystem Team, Fisheries Research Institute: University of Washington, Seattle, WA.

Laughlin, J. 2015. WSF Underwater Background Monitoring Project: Compendium of Background Sound levels for Ferry Terminals in Puget Sound. Washington Department of Transportation Technical Report.

McGraw, K.A., and D.A. Armstrong. 1988. Fish Entrainment by Dredges in Grays Harbor, Washington. *In* Effects of Dredging on Anadromous Pacific Coast Fishes: workshop proceedings, Seattle, September 8-9. Charles Simenstad, editor.

Mofjeld H.O. and L.H. Larsen. 1984. Tides and tidal currents of the inland waters of western Washington. Technical Report NOAA Technical Memorandum ERL PMEL-56, Pacific Marine Environmental Laboratory.

NMFS, U.S. Fish and Wildlife Service, Federal Highway Administration, CA Department of Transportation, CA Department of Fish and Game, OR Department of Transportation, and WA Department of Transportation. 2008. Memorandum: Agreement in Principle for Interim Criteria for Injury to Fish from Pile Driving. Accessed online at: https://www.wsdot.wa.gov/sites/default/files/2018/01/17/ENV-FW-BA_InterimCriteriaAgree.pdf

NMFS. 2015. Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation and Fish and Wildlife Coordination Act Recommendations for the Continued Use of Multi-User Dredged Material Disposal Sites in Puget Sound and Grays Harbor, (Fourth Field HUCs 17110020 Dungeness-Elwha, 17110002 Strait of Georgia, 1711019 Puget Sound, and 17100105 Grays Harbor), Washington. December 17, 2015.

NMFS. 2016. Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing: Underwater Acoustic Thresholds for Onset of Permanent and Temporary Threshold Shifts. NOAA Technical Memorandum NMFS-OPR-55. Office of Protected Resources, Silver Spring, MD.

NMFS. 2018. Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Maintenance Dredging Program for Eight Federally-Authorized Navigation Channels Puget Sound and along the West Coast of Washington State

National Park Service. 2005. *Ebey's Landing National Historical Reserve Draft General Management Plan and Environmental Impact Statement*. National Park Service, Pacific West Region, Park Planning and Environmental Compliance, Seattle, WA. http://parkplanning.nps.gov/document.cfm?projectId=11188&documentID=12304

National Park Service (NPS). 2007. Assessment of Coastal Water Resources and Watershed Conditions at Ebey's Landing National Historical Reserve (Washington). Natural Resource Report NPS/NRWRD/NRTR – 2007/369. Online at: http://www.nature.nps.gov/water/watershed_reports/EBLA_Finallowres.pdf

NPS. 2007. Functional Assessment and Historical Analysis of Crockett Lake, Ebey's Landing National Historical Reserve. In Water Resources Division 2007 Annual Report.

Noggle, C.C. 1978. Behavioral, physiological and lethal effects of suspended sediment on juvenile salmonids. MS thesis. University of Washington, Seattle, WA.

Olsen. 2014. Southern Resident Orca Sighting Compilation. 1948-2013.

Orca Network. 2019. Orca Network Sightings Archive. Accessed online at: http://www.orcanetwork.org/Archives/index.php?categories_file=Sightings%20Archives%20Home

Osbourne, R., J. Calambokidis, and E.M. Dorsey. 1988. *A Guide to Marine Mammals of Greater Puget Sound.* Anancortes, WA: Island Publishers.

Osborne, R.W. 1999. A historical ecology of Salish Sea 'resident' killer whales (*Orcinus orca*): with implications for management. Ph.D. Thesis, University of Victoria, Victoria, B.C.

Pentec Environmental. 2010. Maintenance Dredging in the Lower Snohomish River Acoustic and Water Quality Monitoring, Everett, Washington. Prepared for Port of Everett. Report No. 12021-158

Popper, A.N., A.D. Hawkins, R.R. Fay, D.A. Mann, S. Bartol, T.J. Carlson, S. Coombs, W.T. Ellison, R.L. Gentry, M.B. Halvorsen, S. Løkkeborg, P.H. Rogers, B.L. Southall, D.G. Zeddies, and W.N. Tavolga. 2014. Sound Exposure Guidelines for Fishes and Sea Turtles: A Technical Report prepared by ANSI-Accredited Standards Committee S3/SC1. ASA S3/SC1.4 TR-2014

Puget Sound Dredged Disposal Analysis Program (PSDDA). 1989. Final Environmental Impact Statement: Unconfined Open-Water Disposal Sites for Dredged Material Disposal, Phase II (North and South Puget Sound). Prepared by USACE of Engineers in cooperation with the Environmental Protection Agency and the Washington Departments of Ecology and Natural Resources. Seattle, WA

Sacramento Metropolitan Air Quality Management District. 2008. CEQA tools. Online at http://www.airquality.org/ceqa/index.shtml. Accessed 28 April 2011.

Stansbury, R.M. 2004. Island County 2003 Mosquito Survey Report, prepared for Island County Health Department. January 2004. Available online: https://www.islandcountywa.gov/Health/EH/Documents/Mosquito-Survey-Report-January-2004.pdf

Redding, J.M., and C.B. Schreck. 1987. Physiological effects of coho salmon and steelhead of exposure to suspended solids. Trans. Amer. Fish. Soc. 116:737-744.

SAIC. 2005. Physical Monitoring and Phenol Study at the Commencement Bay PSDDA Site, Tacoma, Washington. Draft Data Report 9 December 2005. Submitted to the Washington Department of Natural Resources , Olympia, WA. Submitted by Science Applications International Corporation, Bothell, WA.

SAIC (Science Applications International Corporation) and RPS Evans Hamilton. 2011. Snohomish River Dredging Sound Pressure Levels Associated with Dredging, Acoustic Monitoring Report, DRAFT. Prepared for the US Army Corps of Engineers, Seattle, Washington.

Servizi, J.A., and D.W. Martens. 1987. Some effects of suspended Fraser River sediments on sockeye salmon (*Oncorhynchus nerka*). Canadian Special Publication in Fisheries and Aquatic Sciences. 96:254-264.

Simenstad, C.A., B.S. Miller, J.N. Cross, K.L. Fresh, S.N. Steinfort, and J.C. Fegley. 1977. Nearshore Fish and Macroinvertebrate Assemblages along the Strait of Juan de Fuca including Food Habits of Nearshore Fish. NOAA Technical Memorandum ERL MESA-20.

Simenstad. 1990. Effects of Dredging on Anadromous Pacific Coast Fishes: Workshop Proceedings, Seattle, September 8-9, 1988.

Smith, Gary F. 1976. "Observations on the Effects of Dredging to Subtidal Communities at Keystone Harbor, Whidbey Island." Western Washington State College. June 1976.

Therrien, Sara C. 2014. In-air and Underwater Hearing of Diving Birds. Doctoral Thesis, University of Maryland.

U.S. Army Corps of Engineers, Seattle District (USACE). 1972. Keystone Harbor Shoaling Study. Engineering Division Technical Memorandum, Seattle, WA.

USACE, Seattle District. 1981. Final Definite Project Report and Final Environmental Assessment, Keystone Harbor Channel Deepening, Admiralty Inlet, Washington. Pp. 145. Available online: https://apps.dtic.mil/dtic/tr/fulltext/u2/a259468.pdf

USACE, Seattle District. 2011. Determination Regarding the Suitability of Proposed Dredged Material from Keystone Harbor Navigation Project (CENWS-OD-TS-24) Whidbey Island, Washington, for Unconfined Open-water Disposal at a DMMP Disposal Site or Beneficial Re-Use.

U.S. Census Bureau. 2019. State and County Quick Facts – Island County. Accessed online at: https://www.census.gov/quickfacts/islandcountywashington

U.S. House of Representatives, 63d Congress, Second Session. 16 May 1914. *Admiralty Inlet with Crockett Lake, Wash.* Document No. 983.

U.S. House of Representatives, 77th Congress, 1st Session. 25 June 1941. *Channel from Puget Sound into Lake Crockett (Keystone Harbor), Wash.* Document No. 303.

Wait, M., T. Buehrens, and B. Trim. 2007. West Whidbey Nearshore Fish Use Assessment 2005-2006. Wild Fish Conservancy.

Washington Department of Fish and Wildlife (WDFW). 2019a. Forage Fish Spawning Map – Washington State. Accessed online at:

https://wdfw.maps.arcgis.com/home/webmap/viewer.html?webmap=19b8f74e2d41470cbd80b1af8dedd6b3&extent=-126.1368,45.6684,-119.6494,49.0781

WDFW. 2019b. Priority Habitat Species Maps. Accessed online at: http://apps.wdfw.wa.gov/phsontheweb/

Washington Department of Natural Resources. 2001. Nearshore Habitat Interactive Map. Accessed online at: https://aquarim.dnr.wa.gov/Default.aspx?maptheme=Nearshore%20Habitat

Washington State Department of Transportation (WSDOT). 2005. *Keystone Harbor Study Final Report*. Washington State Ferries, Seattle, WA.

WSDOT. 2019. Washington State Ferry Statistics: 2018 Annual Report. Accessed online at: https://www.wsdot.wa.gov/ferries/traffic_stats/

Washington State Parks and Recreation Commission. “Fort Casey.” 20 Sept 2005. http://www.parks.wa.gov/parkpage.asp?selectedpark=Fort%20Casey

WhidbeyCamanoIsland.com.2016.Marine Wildlife. Accessed online at: https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwiJvLq_1OzkAhVPaq0KHcYcB6cQFjAAegQIAhAC&url=https%3A%2F%2Fwhidbeycamanoislands.com%2Fwp-content%2Fuploads%2F2016%2F04%2FMarine-Wildlife-Infographic.pdf&usg=AOvVaw1ORlE0Fcf0uVRD95YLMn9B

Whidbey Camano Island Land Trust. 2019. Crockett Lake Protection Area. Accessed online at: https://www.arcgis.com/apps/Cascade/index.html?appid=2e93667b895c4fbf9c861135f23b43b3

# Appendix A – ESA Section 7 Consultation Documentation

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

MAY 24 2017

In Reply Refer To:
**01EWFW00-2017-I-0277**
X Ref: 13410-2008-I-0368-R001
13410-2008-I-0466
13410-2011-I-0125
13410-2011-I-0340
13410-2011-I-0383
01EWFW00-2014-I-0444

Evan Lewis
Chief, Environmental and Cultural Resources Branch
Attn: N. Gleason
Corps of Engineers, Seattle District
P.O. Box 3755
Seattle, Washington 98124-3755

Dear Mr. Lewis:

Subject: Maintenance Dredging Programmatic of Selected Federal Authorized Navigational Channels with Disposal of Dredged Material at Designated Disposal Sites

This letter is in response to your December 16, 2016, request for the U.S. Fish and Wildlife Service's (Service) concurrence with your determination that the Maintenance Dredging Programmatic "may affect, but is not likely to adversely affect" bull trout (*Salvelinus confluentus*), designated bull trout critical habitat, marbled murrelet (*Brachyramphus marmoratus*), streaked horned lark *(Eremophila alpestris strigata*), designated streaked horned lark critical habitat, western snowy plover *(Charadrius alexandrinus nivosus*), and designated western snowy plover critical habitat. The project involves maintenance dredging at eight locations in western Washington: Swinomish Channel, Keystone Harbor, Snohomish River, Duwamish Waterway, Port Townsend Harbor, Quillayute River, Grays Harbor Navigation Channel, and Westhaven Cove Small Boat Basin Entrance Channels and placement of sediment

at 12 beneficial disposal sites. We received your letter and Biological Assessment on December 16, 2017. On March 16, 2017, the Service received an email from the U.S. Army Corps of Engineers (Corps) adding two beneficial use sites to the Swinomish Channel dredging site. This informal consultation has been conducted in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (ESA).

The Corps proposes routine maintenance dredging in Federal Navigation Channels around Puget Sound and along the coast in Grays Harbor and the Quillayute River. The maintenance dredging program encompasses periodic removal of accumulated material from navigation channels using three methods of dredging: clamshell dredge, hydraulic pipeline dredge, or hopper dredge. Disposal of dredged material can occur at authorized multi-user open-water disposal sites, such as Dredged Material Management Program (DMMP) managed sites as well as placement in the nearshore zone for beneficial use (Table 1). Beneficial use includes placement of material to enhance beaches, replace eroded shoreline, soften armored shoreline, and provide sediment for beach renourishment and local sediment drift cells. Disposal of sediment at DMMP sites is addressed through a previous consultation (USFWS 01EWFW00-2015-I-0724). The Corps defined the duration of the project as occurring for the next 25 years (spanning from 2017 through 2042).

The project involves numerous conservation measures to minimize project impacts. Specific conservation measures to avoid, minimize, or reduce impacts to listed species include:

1) Work will occur within the approved in-water work window for each location.

2) Containment berms are constructed with on-site material to hold dredge slurry water to allow infiltration into substrate (Keystone Beach, Site A, and Point Chehalis Revetment Extension Mitigation Site).

3) Dredged material is placed in the dry at low tide (Keystone Beach, First Beach, Site B, and Point Chehalis Revetment Extension Mitigation Site).

4) Clamshell dredging operation will be conducted in a manner that minimizes spillage of excess sediments from the dredge bucket and transport barge to minimize effects to water quality.

The known occurrence of bull trout, bull trout critical habitat, marbled murrelet, streaked horned lark, streaked horned lark critical habitat, western snowy plover, and western snowy plover critical habitat, near or at the dredging and disposal sites is provided in Table 2. Some of the sites, for example the Swinomish Navigation Channel, are a couple miles long, and therefore, only a portion of the site may be in critical habitat or may have a species occurring nearby.

Table 1. The eight dredging sites, their disposal sites, and dredging method.

| Dredging Site | Disposal Site(s) | | Dredging Method |
|---|---|---|---|
| | In-Water Disposal | Upland Disposal | |
| Swinomish Channel | DMMP Site | | Clamshell |
| | Flowlane North: -60 to -120 feet MLLW* | | Clamshell or Hydraulic |
| | Flowlane South: -60 to -120 feet MLLW | | Clamshell or Hydraulic |
| Keystone Harbor | | Keystone Beach: supratidal and upper intertidal zone | Clamshell or Hydraulic |
| Snohomish River | DMMP Site | | Clamshell |
| | | Jetty Island: +15 feet to +1 feet MLLW | Hydraulic |
| | | Parcel "O": trucked to other regional sites | Hydraulic |
| | | Riverside: trucked to other regional sites | Hydraulic |
| Duwamish Waterway | DMMP Site | | Clamshell |
| Port Townsend Harbor | DMMP Site | | Clamshell |
| Quillayute River | | Site A: trucked to other regional sites or First Beach | Hydraulic |
| | First Beach | First Beach: Intertidal above MLLW line | Hydraulic |
| | Site B | Site B: placed on crest of Quillayute Spit | Hydraulic |
| Grays Harbor Navigation Channel | DMMP Site | | Clamshell or hopper |
| | Half Moon Bay: placed as close to shore as possible with a barge | | Clamshell or hopper |
| | South Beach: placed as close to shore as possible with a barge | | Clamshell or hopper |
| | | Point Chehalis Revetment Extension Mitigation Site: Intertidal above +9 MLLW | Hopper Dredge |
| Westhaven Cove Small Boat Basin Entrance Channels | DMMP Site | | Clamshell or hydraulic |

* MLLW – mean lower low water

Table 2. The known occurrence of bull trout, bull trout critical habitat, marbled murrelet, streaked horned lark, streaked horned lark critical habitat, western snowy plover, and western snowy plover critical habitat near of at the dredging and beneficial disposal sites.

| | Bull Trout | Bull Trout Critical Habitat* | Marbled Murrelet | Streaked Horned Lark | Streaked Horned Lark Critical Habitat | Western Snowy Plover | Western Snowy Plover Critical Habitat |
|---|---|---|---|---|---|---|---|
| **Dredging Sites and Their Beneficial Use Disposal Sites** | | | | | | | |
| Swinomish Navigation Channel | x | M | x | | | | |
| • Flowlane North | x | | x | | | | |
| • Flowlane South | x | | x | | | | |
| Keystone Harbor | x | | x | | | | |
| • Keystone Beach | | | x | | | | |
| Snohomish River Navigation Channel | x | M, F | x | | | | |
| • Jetty Island | x | M | x | | | | |
| • Riverside | x | F | | | | | |
| • Site "O" | x | F | | | | | |
| Upper Duwamish Waterway | x | F | | | | | |
| Port Townsend Navigation Channel | x | | x | | | | |
| Quillayute River | x | | x | | | | |
| • Site A | x | | x | | | | |
| • Site B | x | | x | | | | |
| • First Beach | x | | x | | | | |
| Grays Harbor Navigation Channel | x | M, F | x | x | x | x | x |
| • South Beach | x | | x | x | x | x | x |
| • Half Moon Bay | x | M | x | x | x | x | x |
| • Point Chehalis Revetment Extension Mitigation Site | x | M | x | x | x | x | x |
| Westhaven Cove Entrance Channels | x | M | x | x | x | x | x |

* M – marine waters. F – freshwater, lower mainstem river. Designates whether marine or freshwater Primary Constituent Elements are present at the dredging or beneficial disposal sites.

## Bull Trout

The action area contains foraging, migration, and overwintering habitat for anadromous bull trout. We expect that bull trout could occur throughout the action area.

Dredging and disposal operations will result in degraded water quality and impact to benthic invertebrates. Temporary impacts to water quality, including episodic increases in turbidity, suspended sediments, and reduced dissolved oxygen concentrations, will be intermittent and will not be measurable beyond 600 feet down current of the dredging and disposal locations. The loss of benthic invertebrates would be at depths greater than that where normal bull trout foraging occurs. New sediment, placed in the supratidal and intertidal areas, will provide increased habitat for benthic invertebrates and will be rapidly colonized from the surrounding area. These effects will be intermittent and limited in physical extent and duration and will not result in injury or significant disruption to normal bull trout behavior.

In marine waters, bull trout prey species (e.g. forage fish and juvenile salmonids) concentrate in nearshore waters where organisms from lower trophic levels are abundant. Dredging and disposal activities may occur adjacent to documented forage fish spawning location. These activities may result in temporary elevated turbidity and suspended sediment levels but will not result in the long-term destruction or permanent removal of documented forage fish spawning habitat.

Because the action will maintain the authorized channel depths and contours along the ten Federal Navigational Channels which are frequently and repeatedly dredged, we do not expect the action to measurably degrade habitat function. With successful implementation of the conservation measures, we do not expect bull trout to be measurably affected by the temporary effects of the action. Further, the long term effects of the action are not expected to measurably disrupt normal bull trout behaviors (feeding, moving, and sheltering). Therefore, the effects to bull trout are considered insignificant.

**Designated Bull Trout Critical Habitat**

The new critical habitat regulations (81 FR 7214) replaces the term Primary Constituent Element (PCE) with physical or biological features (PBFs). This shift in terminology does not change the approach used in conducting our analysis, whether the original designation identified PCEs, PBFs, or essential features. In this letter, the term PCE is synonymous with PBF or essential features of critical habitat.

The proposed dredging and disposal at beneficial sites occurs at eight locations within Puget Sound and along the western coast of Washington at Grays Harbor and Quillayute River. Dredging occurs both within marine and tidally influenced portions of lower mainstem rivers. Table 1 identifies the dredging and beneficial disposal sites located within or near bull trout designated critical habitat.

The dredging and beneficial disposal sites within or near bull trout critical habitat provide marine and/or freshwater foraging, migrating, and overwintering habitat for subadult and adult bull trout. Of the nice PCEs, five are located within the marine waters (PCEs: #2, #3, #4, #5, and #8). In the tidally influenced rivers, all PCEs except PCE #6, spawning and rearing habitat, are present. We have examined the anticipated effects of the proposed action on the applicable PCEs below.

*PCE #1 - Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.*

The proposed action will have no effect on this PCE.

*PCE #2: Migration 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.*

Dredging and disposal activities may affect the migratory corridor and/or habitats as a result of suspended sediment releases. Dredging will result in impacts to water quality, including episodic increases in turbidity, suspended sediments, and reduced dissolved oxygen

concentrations. Placement of sediment at beneficial disposal sites will result in increased turbidity and suspended sediments when incoming tides inundate disturbed areas. However, water quality impacts will not preclude bull trout movement through the area and any effects will be temporary. The migration habitat will not be permanently altered, destroyed, or degraded. We anticipate that any impacts are unlikely to result in a measurable effect to the function of this critical habitat as a migratory corridor. No other physical, biological, and/or water quality barriers to the migratory corridor are anticipated as a direct or indirect result of the proposed action. Therefore, effects to this PCE are considered to be insignificant.

*PCE #3: An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

Dredging and disposal activities may impact the food base of bull trout through a reduction of prey individuals. Dredging will result in the loss of benthic invertebrates, however, this occurs at a depth greater than that where normal bull trout foraging occurs. Sediment disposal will result in decreased prey abundance (benthic invertebrates) due to placement of sediment within the intertidal zone as well as ground disturbance resulting from pipeline placement or method of placing sediment within the containment berms. These effects will be temporary as the new sediment will provide increased habitat for benthic invertebrates and will be rapidly colonized from the surrounding area. Therefore, effects to this PCE are expected to be insignificant.

*PCE #4: Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

The proposed action would not include any activities that would increase or decrease habitat complexity in the action area. Dredging all occurs in deep water and will not alter the shoreline aquatic environment and habitat complexity. Placement of sediment in the intertidal zone will benefit the nearshore habitat forming processes that establishes and maintains shoreline aquatic environment. No shoreline habitat features will be permanently removed, and there will be no long-term effects to processes that establish and maintain these environments. Therefore, effects to this PCE are expected to be insignificant.

*PCE #5: Water temperatures ranging from 2 to 15°C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range.*

The proposed action does not include any activities that would directly or indirectly alter water temperature. Therefore, the proposed action is expected to have no effect to this PCE.

*PCE #7: A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.*

The proposed action does not include any activities that would directly or indirectly alter the natural hydrograph. Therefore, no effects are anticipated to this PCE.

*PCE #8: Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

Dredging and disposal activities will result in temporary short-term impact to water quality. As described in PCE #2, dredging will result in impacts to water quality, including episodic increases in turbidity, suspended sediments, and reduced dissolved oxygen concentrations. Placement of sediment at beneficial disposal sites will result in increased turbidity and suspended sediments when incoming tides inundate disturbed areas. However, these effects will be temporary and of short duration and therefore, the effects to this PCE will be insignificant.

*PCE #9 - Sufficiently low levels of occurrence of nonnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.*

The project is not anticipated to result in the introduction of nonnative predatory, inbreeding, or competitive species into the action area. Therefore, the proposed action will have no effect to this PCE.

**Marbled Murrelets**

Marbled murrelets are known to use all the marine waters within Puget Sound and also along the coast of Washington. We expect that marbled murrelets could be present in the action area.

For reasons summarized above (*see* Bull Trout), we expect that dredging and beneficial use of dredged materials will have limited impacts to water quality, substrates, and benthic invertebrates, and will have no measurable short- or long-term effect on forage fish abundance and availability. Dredging and disposal activities will result in measurable temporary increases in in-air sound levels. However, these effects will be intermittent and limited in physical extent and duration. Because the proposed action will largely maintain existing conditions, we conclude that the action will not measurably degrade marine habitat functions that are important to marbled murrelets or their prey.

With full and successful implementation of the conservation measures, effects of the proposed action are not expected to result in measurable effects to marbled murrelets and are therefore considered insignificant.

**Western Snowy Plover, Western Snowy Plover Critical Habitat, Streaked Horned Lark, and Streaked Horned Lark Critical Habitat**

Damon Point and the Oyhut State Wildlife Recreation Area, located along the Washington Coast in Grays Harbor County, contain suitable nesting and foraging habitats for the western snowy plover and streaked horned lark. Western snowy plover nesting has not been documented in these areas since 2006, but they are considered essential for the long-term survival and recovery of the species. A nesting population of streaked horned larks is present on Damon Point and at the Oyhut State Wildlife Recreation Area.

The Service has designated Damon Point and the Oyhut State Wildlife Recreation Area as critical habitat for both the western snowy plover (77 FR 36805; June 19, 2012; Unit WA 2 - Damon Point) and streaked horned lark (78 FR 61561; October 3, 2013; Unit 3A Damon Point/Oyhut). Western snowy plovers occupy sandy beaches, inland dune systems, salt flats, mud flats, seasonally exposed gravel bars, and dredge spoil sites. The PCEs of designated critical habitat include: (PCE #1) areas that are below heavily vegetated areas or developed areas and above the daily high tides; (PCE #2) shoreline habitat areas for feeding, with no or very sparse vegetation, that are between the annual low tide or low-water flow and annual high tide or high-water flow, subject to inundation but not constantly under water, that support essential food sources; (PCE #3) surf- or water-deposited organic debris, such as seaweed (including kelp and eelgrass) or driftwood located on open substrates, that supports and attracts food, provides cover or shelter from predators and weather, and assists in avoidance of detection for nests, chicks, and incubating adults; and (PCE #4) minimal disturbance from the presence of humans, pets, vehicles, or human-attracted predators, which provide relatively undisturbed areas for individual and population growth and for normal behavior.

Damon Point's open landscape context and sparse, low-growing vegetation provide the physical and biological features that are essential to support nesting and wintering streaked horned larks. The PCEs of designated critical habitat include: (PCE #1) areas having a minimum of 16 percent bare ground with sparse, low-stature vegetation composed primarily of grasses and forbs less than 13 inches (33 cm) in height; and (PCE #2) large (300 acre), flat (0 to 5 percent slope) areas, or smaller areas, within a landscape context that provides visual access to open water or fields.

Dredging activities within the Grays Harbor Navigation Channel and Westhaven Cove Small Boat Basin Entrance Channels and sediment disposal at the three beneficial use sites in Grays Harbor are all over 0.5 mile from Damon Point and one mile from the Oyhut State Wildlife Recreation Area where suitable western snowy plover and streaked horned lark nesting habitat is located. Based on the distance from suitable nesting habitat we do not expect measureable effects to nesting western snowy plovers, streaked horned larks, or their young. For reasons summarized above *(see* Bull Trout and Marbled Murrelets), we expect that the proposed action will have limited impacts. Because the proposed action's direct and indirect effects will not measurably degrade shoreline habitats or habitat functions that are important to the western snowy plover or the streaked horned lark, these effects are considered insignificant.

Dredging and disposal activities will result in localized impacts and will have no measurable effects on the PCEs for both western snowy plover and streaked horned lark designated critical habitat. Dredging and disposal activities will not degrade shoreline habitats or habitat functions that are important to western snowy plovers, streaked horn larks, or their prey. Damon Point and Oyhut State Wildlife Recreation Area are likely to continue changing, but we expect that they will persist and continue to function as suitable western snowy plover and streaked horned lark nesting and foraging habitat into the future. Therefore, the action's effects to the PCEs and designated western snowy plover and streaked horned lark critical habitat are considered insignificant. The proposed action will not prevent the PCEs of critical habitat from being maintained, and will not degrade the current ability to establish functioning PCEs at the scale of the action area.

This concludes informal consultation pursuant to the regulations implementing the ESA (50 CFR 402.13). This project should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this project.

If you have any questions about this letter or our joint responsibilities under the ESA, please contact Jim Muck at (360) 753-9586 or jim_muck@fws.gov.

Sincerely,

for Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

**Literature Cited**

USFWS (U.S. Fish and Wildlife Service). 2015. Letter of Concurrence: Continued Use of Multiuser Dredged Material Disposal Site in Puget Sound and Grays Harbor. Reference No.: 01EWFW00-2015-I-0724. Washington Fish and Wildlife Office, Lacey WA.

# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

JUL 28 2015

In Reply Refer To:
**01EWFW00-2015-I-0724**

Evan Lewis, Chief
Environmental and Cultural Resources Branch
Seattle District, U.S. Army Corps of Engineers
ATTN: ERS Branch (Laufle)
P.O. Box 3755
Seattle, Washington 98124-3755

Dear Mr. Lewis:

Subject: Continued Use of Multiuser Dredged Material Disposal Sites in Puget Sound and Grays Harbor

This letter is in response to your June 2015 request for our concurrence with your determination that the proposed action in Puget Sound and Grays Harbor, Washington, "may affect, but is not likely to adversely affect" federally listed species. We received your letter, and Biological Evaluation, providing information in support of "may affect, not likely to adversely affect" determinations, on June 22, 2015.

**Project Description**

The Army Corps of Engineers (Corps) and the Dredged Material Management Program (DMMP) agencies propose to manage the operation and monitoring of ten open-water dredged material disposal sites, eight in Puget Sound and two in Grays Harbor. The disposal sites will be used by federal and non-federal entities for disposal of material that is suitable for open-water disposal. Three of the Puget Sound sites and both of the Grays Harbor sites will be used for dispersive disposal – currents will carry released dredged material so that sediments are dispersed. The remaining five Puget Sound sites will be used as non-dispersive sites – released dredged material will remain localized beneath the release site.

Specifically, you requested informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) for the federally listed species and critical habitat identified below.

- Bull trout (*Salvelinus confluentus*)
- Bull trout critical habitat
- Marbled murrelet (*Brachyramphus marmoratus*)

We believe that sufficient information has been provided to determine the effects of the proposed action and to conclude whether it would adversely affect federally listed species and/or designated critical habitat. Our concurrence is based on information provided by the action agency, best available science, and complete and successful implementation of agreed-upon conservation measures.

## EFFECTS TO BULL TROUT

Effects and Disturbance

Temporary and/or long-term effects from the action are not expected to measurably disrupt normal bull trout behaviors (i.e., the ability to successfully feed, move, and/or shelter), and are therefore considered insignificant and/or discountable:

- The action will result in temporary impacts to water quality, including potential temporary increases in elevated levels of turbidity and contaminants, although the threat of increased contaminants will be decreased by testing dredged material prior to disposal to ensure it does not have the potential to adversely affect biological resources. These effects will be intermittent and limited in physical extent and duration.
- Long-term use and operations of the dredged material disposal sites will not disrupt normal bull trout behaviors (i.e., the ability to successfully feed, loaf, move, and/or shelter).

Effects to Bull Trout Habitat and Prey Sources

With successful implementation of the agreed-upon conservation measures, we expect that temporary impacts from the action will not measurably degrade or diminish habitat functions or prey resources in the action area, and effects are therefore considered insignificant and/or discountable:

- Construction methods and proposed permanent features may impact habitat that supports bull trout and/or their prey sources. These impacts will be limited in physical extent and/or duration, and will not measurably degrade habitat functions, including prey resources, that are important to bull trout within the action area:
    - Use of the dredged material disposal sites may result in periodic and/or temporary impacts to water quality through elevated levels of turbidity and contaminants, although the threat of increased contaminants will be decreased by testing dredged material prior to disposal to ensure it does not have the potential to adversely affect biological resources; and these effects will be intermittent and of short duration.
    - Any in-water disposal of dredged material will comply with a current, valid Site Use Authorization approved under the Dredged Material Management Program. The action will not degrade habitat functions that are important to bull trout or their prey resources, including diminishing forage fish or salmonid production.

**EFFECTS TO BULL TROUT CRITICAL HABITAT**

The final revised rule designating bull trout critical habitat (75 FR 63898 [October 18, 2010]) identifies nine Primary Constituent Elements (PCEs) essential for the conservation of the species. The proposed action may affect the PCEs listed below; however, effects to these PCEs are not expected measurably affect them and are therefore considered insignificant or discountable:

PCE 2: *Migration 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.*

- The DMMP disposal sites are all greater than 50 feet in depth. Concentration of suspended sediment in nearshore areas is not expected to reach levels that would impede migration.

PCE 3: *An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.*

- The DMMP disposal sites are located offshore in deep water either where prey are not located or where the dredged material will rapidly disperse, not significanly altering the disposal area.

PCE 4: *Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.*

- The action will have no effect on this PCE.

PCE 5: *Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence.*

- The action will have no effect on this PCE.

PCE 8: *Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.*

- The action may impact water quantity and/or quality. However, the effects will be temporary; components of the project design include actions to avoid, reduce, or compensate for the effects from the impacts; and/or we would be unable to meaningfully measure, detect, or evaluate the effects.

## EFFECTS TO MARBLED MURRELET

Effects - Marine Environment

Temporary exposures and effects from the action are not expected to measurably disrupt normal marbled murrelet behaviors (i.e., the ability to successfully feed, move, and/or shelter) and are therefore considered insignificant and/or discountable:

- The action will result in temporary impacts to water quality, including potential temporary increases in elevated levels of turbidity and contaminants, although the threat of increased contaminants will be decreased by testing dredged material prior to disposal to ensure it does not have the potential to adversely affect biological resources. These effects would be intermittent and limited in physical extent and duration.

- Long-term use and operations of the dredged material disposal sites may result in increased sound levels or other temporary stressors that could disturb marbled murrelets. However, due to the present level of development and activity in the vicinity, the action is not expected to disrupt normal marbled murrelet behaviors (i.e., the ability to successfully feed, loaf, move, and/or shelter).

Effects to Marbled Murrelet Foraging Habitat and Prey Sources

With successful implementation of the included conservation measures, we expect that temporary impacts from the action will not measurably degrade or diminish habitat functions or prey resources in the action area, and effects are therefore considered insignificant and/or discountable:

- Construction methods and proposed permanent features may impact habitat that supports marbled murrelets and/or their prey sources. These impacts will be limited in physical extent and/or duration and will not measurably degrade habitat functions, including prey resources that are important to marbled murrelets within the action area:
    - Use of the dredged material disposal sites may result in periodic impacts to water quality through elevated levels of turbidity and contaminants, although the threat of increased contaminants will be decreased by testing dredged material prior to disposal to ensure it does not have the potential to adversely affect biological resources; and these effects will be intermittent and short duration.
    - Any in-water disposal of dredged material will comply with a current, valid Site Use Authorization approved under the Dredged Material Management Program. The action will not degrade habitat functions that are important to marbled murrelets or their prey resources, including diminishing forage fish.

**Conclusion**

This concludes consultation pursuant to the regulations implementing the Endangered Species Act (50 CFR 402.13). Our review and concurrence with your effect determination is based on the implementation of the project as described. It is the responsibility of the Federal action agency to ensure that projects that they authorize or carry out are in compliance with the regulatory permit and/or the Endangered Species Act, respectively. If a permittee or the Federal action agency deviates from the measures outlined in a permit or project description, the Federal action agency has the obligation to reinitiate consultation and comply with section 7(d).

This project should be re-analyzed and re-initiation may be necessary if 1) new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation, 2) if the action is subsequently modified in a manner

that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or 3) a new species is listed or critical habitat is designated that may be affected by this project.

This letter and its enclosures constitute a complete response by the U.S. Fish and Wildlife Service to your request for informal consultation. A complete record of this consultation is on file at the Washington Fish and Wildlife Office, in Lacey, Washington. If you have any questions about this letter or our joint responsibilities under the Endangered Species Act, please contact the consulting biologist identified below.

U.S. Fish and Wildlife Service Consultation Biologist(s):
Lee Corum (360-753-5835)

Sincerely,

Martha L. Jensen

for Eric V. Rickerson, State Supervisor
Washington Fish and Wildlife Office

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1201 NE Lloyd Boulevard, Suite 1100
Portland, OR 97232

**Refer to NMFS No.:**
**WCR-2016-6057**

January 26, 2018

Evan R. Lewis, Chief
Environmental and Cultural Resources Branch
Corps of Engineers, Seattle District
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for U.S Army Corps of Engineers' (COE) proposed 25-year maintenance dredging program for eight Federally-Authorized Navigation Channels in western Washington State.

Dear Mr. Lewis:

Thank you for your letter of December 16, 2016, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for U.S Army Corps of Engineers' (COE) maintenance dredging program for eight federally-authorized navigation channels around the Puget Sound and along the west coast of Washington State. Thank you, also, for your request for consultation pursuant to the essential fish habitat (EFH) provisions in Section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA)(16 U.S.C. 1855(b)) for this action.

The enclosed document contains the biological opinion (Opinion) prepared by NMFS pursuant to section 7(a)(2) of the ESA on the effects of the proposed action. In this Opinion, NMFS concludes that the proposed action is likely to adversely affect but not likely to jeopardize the continued existence of Puget Sound Chinook salmon, Puget Sound steelhead, Southern eulachon, and Southern green sturgeon. NMFS also concludes that the proposed action is likely to adversely affect designated critical habitat for Puget Sound Chinook salmon, Hood Canal summer-run chum salmon, Puget Sound steelhead, Puget Sound/Georgia Basin bocaccio, and Southern green sturgeon but is not likely to result in the destruction or adverse modification of those designated critical habitats. In this Opinion, we also conclude that the proposed action is not likely to adversely affect any ESA-listed salmon from the Columbia and Willamette River evolutionarily significant units, and their designated critical habitats; Hood Canal Summer-run chum salmon; Puget Sound/Georgia Basin (PS/GB) bocaccio; PS/GB yelloweye rockfish and its designated critical habitat; seven ESA-listed marine mammal species; designated critical habitat for southern resident killer whales; four ESA-listed marine turtles; and designated critical habitat for leatherback turtles.

As required by section 7 of the ESA, NMFS has provided an incidental take statement with this Opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize the impact of incidental take associated with this action, and sets forth nondiscretionary terms and conditions that the COE must comply with to meet those measures. Incidental take from actions that meet these terms and conditions will be exempt from the ESA's prohibition against the take of listed species.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat (EFH) pursuant to Section 305(b) of the MSA. NMFS reviewed the likely effects of the proposed action on EFH, and concluded that the action would adversely affect designated EFH for Pacific Coast Salmon, Pacific Coast Groundfish, and Coastal Pelagic Species. Therefore, we have included the results of that review in Section 3 of this document.

Please contact Donald Hubner in the North Puget Sound Branch of the Oregon/Washington Coastal Office at (206) 526-4359, or by electronic mail at Donald.Hubner@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

Barry A. Thom
Regional Administrator

cc: Nancy Gleason, COE

**UNITED STATES DEPARTMENT OF COMMERCE**
**National Oceanic and Atmospheric Administration**
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
7600 Sand Point Way N.E.
Seattle, Washington 98115

December 17, 2015

In Reply Refer to:
2015/2975

David Fox
Chief, Dredged Material Management Office
U.S Army Corps of Engineers, Seattle District
PO Box 3755
4735 E. Marginal Way South
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation and Fish and Wildlife Coordination Act Recommendations for the Continued Use of Multi-User Dredged Material Disposal Sites in Puget Sound and Grays Harbor, (Fourth Field HUCs 17110020 Dungeness-Elwha, 17110002 Strait of Georgia, 1711019 Puget Sound, and 17100105 Grays Harbor), Washington

Dear Mr. Fox:

Thank you for your letter received July 29, 2015, requesting initiation of consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 et seq.) for the continued use of ten multi-user dredged material disposal sites in Puget Sound and Grays Harbor.

The enclosed document contains a biological opinion (opinion) that analyzes the effects of your proposal to permit the transport and disposal of dredged material at eight multi-user open-water disposal sites in Puget Sound and two multi-user open-water disposal sites in Grays Harbor. In this opinion, NMFS concludes that the action, as proposed, is not likely to adversely affect the Puget Sound (PS) Chinook salmon (*Oncorhynchus tshawytscha*) Evolutionary Significant Unit (ESU), and the Lower Columbia River (LCR), Upper Willamette River Chinook salmon LCR coho salmon (*O. kisutch*), Hood Canal (HC) summer-run, Columbia River chum salmon (*O. keta*), and LCR steelhead (*O. mykiss*) ESUs. NMFS also concludes that the action, as proposed, is not likely to adversely affect the Southern Distinct Population Segment (DPS) of Pacific eulachon (*Thaleichthys pacificus*), the Southern DPS of North American green sturgeon (*Acipenser medirostris*), the Southern Resident (SR) killer whale DPS (*Orcinus orca*), and humpback whale (*Megaptera novaeangliae*). NMFS also concludes that the proposed action is not likely to jeopardize the continued existence of the PS/Georgia Basin DPSs of bocaccio (*Sebastes paucispinis*), canary rockfish (*S. pinniger*), and yelloweye rockfish (*S. ruberrimus*). Further, NMFS concludes that the proposed action would not result in the destruction or adverse modification of designated critical habitat for PS Chinook salmon, HC summer-run chum

salmon, PS/Georgia Basin bocaccio, canary rockfish, and yelloweye rockfish, Southern green sturgeon, SR killer whale, or leatherback sea turtle (*Dermochelys coriacea*). NMFS also concludes that the proposed action would have no effect on proposed critical habitat for PS steelhead.

As required by section 7 of the ESA, NMFS provided an incidental take statement with the biological opinion. The incidental take statement describes reasonable and prudent measures NMFS considers necessary or appropriate to minimize incidental take associated with this action. The take statement sets forth nondiscretionary terms and conditions, including reporting requirements that the COE and any person who performs the action must comply with to carry out the reasonable and prudent measures. Incidental take from actions that meet these terms and conditions would be exempt from the ESA take prohibition.

This document also includes the results of our analysis of the action's likely effects on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA), and includes five conservation recommendations to avoid, minimize, or otherwise offset potential adverse effects on essential fish habitat. Section 305(b) (4) (B) of the MSA requires Federal agencies to provide a detailed written response to NMFS within 30 days after receiving these recommendations.

If the response is inconsistent with the essential fish habitat conservation recommendation, the COE must explain why the recommendation will not be followed, including the scientific justification for any disagreements over the effects of the action and the recommendation. In response to increased oversight of overall essential fish habitat program effectiveness by the Office of Management and Budget, NMFS established a quarterly reporting requirement to determine how many conservation recommendations are provided as part of each essential fish habitat consultation and how many are adopted by the action agency. Therefore, we request that in your statutory reply to the essential fish habitat portion of this consultation, you clearly identify the conservation recommendation(s) accepted.

Please contact Dan Tonnes of my staff at the Protected Resources Division in Seattle, Washington at (206) 526-4643, by e-mail at dan.tonnes@noaa.gov, or by mail at the letterhead address if you have questions regarding the rockfish portion of this section 7 consultation, or if you require additional information. Contact Matthew Longenbaugh of my staff at the Oregon/Washington Area Office in Lacey, Washington at (360) 753-7761, by e-mail at matthew.longenbaugh@noaa.gov, or by mail at the letterhead address for questions regarding questions on the salmonid, sturgeon, or eulachon portions of this section 7 consultation; and Teresa Mongillo of my staff at the Protected Resources Division in Seattle, Washington at (206) 526-4749, by e-mail at teresa.mongillo@noaa.gov, or by mail at the letterhead address for questions regarding the marine mammal portions of this section 7 consultation.

Sincerely,

FOR William W. Stelle, Jr.
Regional Administrator

Enclosure

cc: Jeff Laufle, COE
Evan Lewis, COE
OWAO
Teresa Mongillo, PRD
Longenbaugh, OWAO
Evan Lewis, COE Evan.R.Lewis @ usace.army.mil
David Fox, COE David.F.Fox@usace.army.mil
Jeff Laufle, COE Jeffrey.C.Laufle@usace.army.mil
Administrative File: 151401WCR2015PR

# Appendix B – Finding of No Significant Impact and CWA Section 404 Statement of Findings

CENWS-PMP-E

**DRAFT FINDING OF NO SIGNIFICANT IMPACT**
**AND**
**CLEAN WATER ACT SECTION 404 STATEMENT OF FINDINGS (FONSI/SOF)**
Keystone Harbor Maintenance Dredging and Disposal
Fiscal Year 2020 through FY 2035[1]
Island County, Washington

**1. Name of Waterway:** Keystone Harbor

**2. Background:** The U.S. Army Corps of Engineers (USACE) is undertaking the following project, authorized by several acts that together created the current authorized project scope. The Department of the Army Lake Crockett navigation project and maintenance dredging was authorized by Section 2 of the River and Harbor Act 1945 (March 2, 1945), Public Law 79-14. In 1971, the project was widened under authority of Section 107 of the River and Harbor Act of 1960 (July 14, 1960), Public Law 86-645. In 1993, the project was deepened by authority of Section 107 of the River and Harbor Act of 1960 (July 14, 1960), Public Law 86-645, as amended by Section 915 of the Water Resources Development Act of 1986 (November 17, 1986) Public Law 99-662.

This artificial harbor is a dredged basin originally constructed by the USACE in 1947- 48 and modified in 1971 and 1993. USACE constructed the harbor by dredging a triangular shaped bay from an existing barrier beach, and connected the harbor to Admiralty Bay with a navigation channel. USACE built a stone breakwater on the eastern side of the harbor. The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. The channel is designed to be 1,800 feet long, 200 feet wide, and 25 feet below Mean Lower Low Water (MLLW), with authorized overdepth of an additional 2 feet below MLLW.

Maintenance dredging is necessary for safe navigation conditions for the Washington State Ferry System vessels to dock at Keystone Harbor for uninterrupted service on the Port Townsend/Coupeville ferry route, and to ensure continuity of the sediment transport processes along the shoreline in the project area. When the channel and ferry slip become too shallow, the ferry must cancel sailings, and the ferry has run aground during landings at low tide. This limits service on the Port Townsend/Coupeville run. The purpose of the beach disposal component of the project is to prevent erosion to the point of undermining the jetty and losing park infrastructure.

**3. Action:** The USACE proposes to conduct routine maintenance dredging of accumulated sediment from Keystone Harbor. Maintenance dredging will consist of removing up to 50,000 cubic yards (CY) of material per dredge event from the Keystone

[1] FY (fiscal years) span from 1 October to 30 September. This document covers dredging events from 16 July 2020 to 15 February 2035 (these dates are associated with the in-water work window)

Harbor navigation channel between stations 0+00 to 15+00, with a maximum of of five dredge events totaling 165,000 CY over the 15-year period. The method will either be mechanical dredging with material placed on a barge then transferred to the adjacent beach, or hydraulic pipeline dredging with direct placement on the beach. Placement of the dredged material will occur on the adjacent previously used beach disposal site, which is approximately 2.5 acres. All the dredged sand and gravel will be used beneficially to re-nourish a section of the beach to the breakwater. Dredged material will be placed water-ward, starting from the existing beach and graded uniformly to the existing grade. The details of the dredging and placement methodology can be found in section 2.2 of the Environmental Assessment (EA).

USACE expects the duration of dredging and disposal to take up to 60 days. Dredging will take place at night from 9pm to 5am to accommodate ferry traffic. Material placement will typically take place during the daylight hours for clamshell dredging, and night time hours for hydraulic dredging. Dredging and disposal will occur within the approved Washington Department of Fish and Wildlife in-water construction window of 16 July to 15 February to avoid vulnerable life stages of sensitive and ESA-listed species.

**4. Coordination:** The Federal action is described in the EA and Clean Water Act Section 404 Public Interest Review Keystone Harbor Maintenance Dredging and Disposal, dated February 2020, and is hereby incorporated by reference.

**a. Letters of Comment and Response:** A public comment period on the Draft EA, the contents of which are consistent with a Clean Water Act (CWA) Section 404 Public Notice, will take place from 4 February 2020 to 4 March 2020.

**b. Federal Agencies**: The United States Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS), and the Department of the Interior, U.S. Fish and Wildlife Service (USFWS) are responsible for the Endangered Species Act of 1973 (ESA) listed species in and around Keystone Harbor. The USACE submitted a Combined-Projects Biological Assessment (BA) for maintenance dredging, of which this dredging action is one component, to NMFS and USFWS (the Services). USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with all of USACE's effects determinations of NLAA, but did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018.

An Essential Fish Habitat (EFH) determination for the maintenance dredging of the Keystone Harbor was included in the Combined-Projects Biological Assessment submitted to NMFS. The USACE has determined that maintenance dredging may adversely affect EFH for the entire maintenance dredging program, including the Keystone Harbor, because removal of dredged material will constitute a detectable effect to EFH by disturbing the substrate and associated water quality impacts. NMFS

concurred with this determination in a letter dated 26 January 2018. NMFS listed seven conservation measures to minimize and/or avoid adverse impacts to EFH. USACE provided a detailed response to NMFS within 30 days as required by section 3.5(b)(4)(B) of the MSA that agreed with all conservation recommendations, except to return all woody debris to the waterway. For the measure regarding woody debris, standard practice is to dredge around large logs with or without root wad so that they remain in the water. Other woody debris is typically small fragments of trees, bushes, or scrap lumber, and not of the quality to be beneficially used. If this woody debris is larger than two feet in any dimension, it is separated from the dredged material and disposed of at an appropriate disposal facility. The USACE response to the EFH conservation recommendations concludes the EFH consultation requirements.

### c. State and Local Agencies

**(1)** The USACE is requesting a 401 Water Quality Certification (WQC) from the Washington Department of Ecology (WDOE) and will comply with conditions associated with the discharge of dredged material into the waters of the U.S.

**(2)** The USACE has determined that the proposed project is consistent to the maximum extent practicable with the enforceable policies of the approved Washington State Coastal Zone Management Program, using Island County's Shoreline Management Program. The USACE has prepared a Coastal Zone Consistency Determination and has submitted it to WDOE.

**(3)** No cultural resources have been identified within the Keystone Harbor navigation channel.

**(4) Treaty Tribes:** Eight Native American tribes have usual and accustomed fishing rights within the area of the proposed dredging and disposal of material. They are as follows:

- Lummi Nation
- Jamestown S'Klallam Tribe
- Port Gamble S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Skokomish Tribe
- Suquamish Tribe
- Swinomish Tribe
- Tulalip Tribe

The USACE has sent letters to the tribal chairs and tribal biologists soliciting feedback to avoid impacts to tribal fisheries.

**5. Environmental Effects and Impacts of the Preferred Alternative.**

**a. Summary of Effects:** The EA and Clean Water Act Section 404 Public Interest Review for Keystone Harbor Maintenance Dredging and Disposal, describes the effects of the proposed project. Unavoidable adverse effects include disruption of benthic communities, minor and temporary water quality impacts through turbidity and depressed dissolved oxygen, elevated noise, and minor emissions of air pollutants and greenhouse gases. However, these effects will be temporary and localized and are not expected to be significant.

**b. Compliance with Applicable Environmental Laws:**

- Clean Water Act, Sections 404 and 401: The USACE prepared a 404(b)(1) evaluation to document findings regarding this project pursuant to Section 404 of the CWA, attached as Appendix C of the EA, and prepared a 404 public notice for public comment. The USACE is requesting a 401 Water Quality Certification from WDOE and will comply with all applicable requirements and conditions associated with the discharge of dredged material into waters of the U.S.

- Coastal Zone Management Act: The USACE prepared a coastal zone consistency determination and determined that the proposed action is consistent to the maximum extent practicable (Appendix D of the EA). USACE submitted this consistency determination to WDOE and is awaiting their response.

- National Environmental Policy Act: The USACE has prepared a Draft EA and is circulating the document for a 30-day public comment period from 4 February 2020 to 4 March 2020.

- Endangered Species Act: The USACE submitted a Combined-Projects Biological Assessment (BA) for maintenance dredging, of which this dredging action is one component, to NMFS and USFWS (the Services). USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with all of USACE's effects determinations of NLAA, but did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018.

- Magnuson-Stevens Fishery Conservation and Management Act: An Essential Fish Habitat (EFH) determination for the maintenance dredging of Keystone Harbor was included in the Combined-Projects Biological Assessment submitted to NMFS. The USACE has determined that maintenance dredging may adversely affect EFH for the entire maintenance dredging program, including the Keystone Harbor, because removal of dredged material will constitute a detectable effect to EFH by disturbing the substrate and associated water quality impacts. NMFS concurred with this determination in a

letter dated 26 January 2018.

- Clean Air Act: Maintenance dredging and disposal activities under this project will result in emissions that are clearly *de minimis* and will constitute maintenance dredging where no new depths are required and no new disposal sites are designated, so the project is exempt from any requirement to conform to a State Implementation Plan under 40 CFR 93.153 (c)(2)(ix).

- Marine Mammal Protection Act (MMPA): USACE has determined that the preferred alternative would not significantly disturb any marine mammal behavioral patterns (harassment or cause any harm), and thus it is not necessary to pursue an incidental harassment authorization under the MMPA. The rationale for this determination is provided in the EA.

- National Historic Preservation Act: The National Historic Preservation Act (16 U.S.C. § 470) requires that the effects of proposed Federal undertakings on sites, buildings structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. USACE, Seattle District has reviewed the proposed action and conducted an analysis in accordance with Section 106 of the NHPA's implementing regulations at 36 C.F.R.§ 800. Review of the proposed dredging finds that the activity will have no adverse effects to known archaeological or cultural resources within the area of potential effect. No further archaeological work is recommended. An area of potential effect (APE) letter was prepared and sent to the State Historic Preservation Officer (SHPO) for review and concurrence. USACE received concurrence on the APE from the SHPO on 3 February 2020. USACE will be sending another letter to the SHPO with a determination of "no adverse effects to historic properties" and expects a response prior to the finalization of this EA. Tribal notification letters were also sent to the Jamestown Sklallam Tribe, Lower Elwah Klallam, Lummi Nation, Port Gamble Skallam Tribe, Skokomish Tribe, Suquamish Tribe, Swinomish Tribe, and Tulalip Tribe asking if there are any properties of cultural or religious significance that would be affected by the project. Notified tribes will review and comment within 30 days.

- Tribal Treaty Fishing Rights: Interference with treaty fishing rights will be avoided by performing dredging operations at times that do not conflict with treaty-protected fishing activities. Letters were sent to all tribes with usual and accustomed fishing rights (U&A) in the area soliciting comments on the proposed dredging and disposal.

- Executive Order 12898, Environmental Justice: Maintenance dredging in the Keystone Harbor and associated beach disposal is not expected to result in any disproportionate adverse environmental effects or impacts on the health of minority/low-income populations. Maintenance of the existing navigation project would not negatively affect property values in the area or socially stigmatize local residents or businesses.

- Executive Order 11988, Floodplain Management: The USACE has determined that the proposed action is not in the base floodplain, does not increase flood risk, and there is no practicable alternative that meets the project purpose.

**6. Determination.**

**a. Results of the Environmental Analysis for the Keystone Harbor Maintenance Dredging Project**: The draft EA prepared for this project recommended this FONSI/SOF. The proposed project will not constitute a major Federal action significantly affecting the quality of the human environment.

**b. Alternatives:** Three alternatives were considered in the EA for the Maintenance Dredging of the Keystone, dated February 2020: (1) no action, (2) dredging with disposal at the adjacent beach, and (3) dredging with disposal at the Port Townsend PSDDA open-water sites.

The USACE rejected Alternative 1 because it would not meet the project purpose and need. Alternative 3 was rejected due to the costs associated with hauling to the open-water disposal site, and it does not address the beach erosion down-drift of the navigation channel.

**c. Individual and Cumulative Environmental Effects:** Based on the analysis presented in the EA, the additional incremental effect of the preferred alternative is insignificant. No significant adverse effects on recreation, aesthetics, or the economy are anticipated. The USACE has determined that there will be no significant adverse effects to aquatic ecosystem functions and values. Alternative 2 was selected because it would restore the project to congressionally authorized depths, ensuring that safe navigation could continue. Additionally, the placement of dredged materials along the adjacent beach will prevent erosion and eventual undermining of the jetty.

**7. Summary of Impacts and Compliance:** Impacts of the proposed work will be minor and temporary. This project complies with the ESA: a biological assessment addressing the dredging activity has been prepared and was transmitted to NMFS and USFWS; USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet. NMFS did not concur with all of USACE's effects determinations of NLAA, but did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE. An Essential Fish Habitat (EFH) determination for the maintenance dredging of Keystone Harbor was included in the Combined-Projects Biological Assessment submitted to NMFS. The USACE has determined that maintenance dredging may adversely affect EFH for the entire maintenance dredging program, including the Keystone Harbor, because removal of dredged material will constitute a detectable effect to EFH by disturbing the substrate and associated water quality impacts. NMFS concurred with this determination and issued recommended

conservation measures. The USACE has determined that it is not necessary to pursue a permit under the MMPA for noise impacts to harbor seals and California sea lions. This project will comply with Sections 401 and 404 of the Clean Water Act. A 404(b)(1) analysis has been prepared, and the USACE has requested a Water Quality Certification and concurrence with a consistency determination under the Coastal Zone Management Act from the WDOE. The project complies with the NHPA. The USACE has coordinated with the Washington SHPO, the Swinomish Indian Tribal Community, Samish Tribe, Upper Skagit Tribe, and the Sauk-Suiattle Tribe, and is awaiting responses.

**8. District Engineer's Findings and Conclusions:** I have evaluated the dredging and disposal activity in light of the public interest factors prescribed in 33 CFR 336.1(c). The following factors were evaluated as considerations potentially impacting the quality of the human environment in the accompanying EA and coastal zone consistency evaluation: navigation and the Federal Standard, water quality, coastal zone consistency, wetlands, endangered species, historic resources, scenic values, recreational values, fish and wildlife, and application of non-Federal land use policies. No additional impacts to state/regional/local land use classifications, determinations, and/or policies are anticipated as the project will maintain a federally authorized navigation channel that is already used for vessel transit. In accordance with 33 CFR 337.1(a)(14) and 325.3(c)(1), the following additional relevant factors were considered: conservation, economics, shoreline erosion and accretion, safety, and property ownership.

The preferred alternative represents the least costly alternative, constituting the discharge of dredged or fill material into waters of the U.S. in the least costly manner and at the least costly and most practicable location. The preferred alternative is consistent with sound engineering practices, and meets the environmental standards established by the Clean Water Act Section 404(b)(1) evaluation process. Execution of the selected alternative, following considerations of all applicable evaluation factors, is in the public interest.

Furthermore, based on the attached EA, I have determined that the selected action will not have significant effects on the quality of the human environment and does not require preparation of an environmental impact statement.

_____ _____

Date

MARK A. GERALDI
COL, EN
Commanding

# Appendix C – Clean Water Act Section 404(b)(1) Evaluation

# Keystone Harbor Maintenance Dredging and Disposal
# Fiscal Years 2020 through FY 2035[1]
# Island County, WA
# Substantive Compliance for Clean Water Act, Section 404(b)(1) Evaluation

**1. Introduction.** The purpose of this document is to record the U.S. Army Corps of Engineers' (USACE's) evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act (CWA). Keystone Harbor is located on the west side of Whidbey Island, in Island County, Washington. This artificial harbor is a dredged basin constructed by the USACE in 1947-48 and is connected to Admiralty Bay by a Federal navigation channel. The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. Construction of the basin, entrance channel, and adjacent rock jetty interrupted the natural eastward transport of beach material. Consequently, shoaling of the entrance channel requires maintenance dredging every four to six years to ensure safe navigation. The channel is designed to be 1,800 feet long, 200 feet wide, and 25 feet below Mean Lower Low Water (MLLW), herein notated as -25 feet, with authorized overdepth of 2 feet. This allows safe navigation for the ferries to dock during tides as low as -4.5 feet. When the channel and ferry slip become too shallow, the ferry must cancel sailings, and the ferry has run aground during landings at low tide. This limits service on the Port Townsend/Coupeville run. The following action is covered by this document: maintenance dredging up to five dredge events totaling 165,000 cubic yards (cy) of material over a 15-year period. While some dredge events may be much less, up to 50,000 cy per dredge event is permitted from the channel (station 0+00 to 15+00) with disposal of material as nourishment on the beach at Fort Casey State Park to the east of the channel. Because the navigation channel disrupts the littoral drift on the east side of the channel, beach nourishment is necessary to replenish the sand normally deposited by littoral drift.

The information contained in this document reflects the findings of the project record. Specific sources of information included the following:

a. Biological Evaluation: Fiscal Year 2017 through 2042 Maintenance Dredging of Selected Federal Authorized Navigation Channels, with Disposal of Dredged Material at Designated Disposal Sites, dated December 2016

b. Keystone Harbor Routine Maintenance Dredging for Fiscal Year 2020 Draft Environmental Assessment (EA)/Clean Water Act Section 404 Public Interest Review

c. 404(b)(1) Evaluation (see below)

d. Public Interest Review (see below and in section 7 of the EA)

This document addresses the substantive compliance issues of the Clean Water Act 404(b)(1) Guidelines [40 CFR §230.12(a)] and Public Interest Factors under the Regulatory Program of the Corps of Engineers [33 CFR §320.4 as reference for application to Civil Works project by analogy].

**2. Description of Proposed Discharge.** Disposal of the dredged material will occur next to Keystone Harbor on the adjacent previously used beach disposal site, which is approximately 2.5 acres. All the dredged sand and gravel will be used beneficially to re-nourish a section of the beach to the east of the breakwater. The majority of the material will be placed above mean higher high water (MHHW) with some of the material lower to be available to the aquatic ecosystem at most high tides. The method will

[1] FY (fiscal years) span from 1 October to 30 September. This document covers dredging events from 16 July 2020 to 15 February 2035 (these dates are associated with the in-water work window)

either be mechanical dredging with dredge material placed on a barge then transferred to the beach or hydraulic pipeline dredging with direct placement on the beach. The duration is expected to take up to 60 days. Dredging will take place at night to accommodate ferry traffic. Material placement will typically take place during the daylight hours for clamshell dredging, and night time hours for hydraulic dredging. All work will occur with the in-water work window of July 16 to February 15.

**3. Project Purpose and Need.** The purpose of this project is to provide necessary safe navigation conditions for the Washington State Ferry System vessels to dock at Keystone Harbor for uninterrupted service on the Port Townsend/Coupeville ferry route, and to ensure continuity of the sediment transport processes along the shoreline in the project area. The purpose of the beach disposal component of the project is to prevent erosion to the point of undermining the jetty and losing park infrastructure. The navigation project interrupts the natural littoral drift process. This results in gradual erosion of the harbor features and related recreation facilities. Continued erosion risks undermining the east jetty, an essential feature of the Federal navigation project. Over several years, severe erosion can occur on the adjacent beach to the east and can undermine the Washington State Park's restroom facilities, picnic areas, parking lot, and recreational boat launch

**4. Evaluation of Alternatives to Meet the Project Purpose.** The alternatives evaluated for this project were as follows:

**a. Alternative 1 – No-Action.** Under the no-action alternative, USACE would not take any actions to maintain the Keystone Harbor navigation channel. USACE would not dredge the harbor or address the continuing erosion of the neighboring beach.

**b. Alternative 2 – Maintenance Dredging with Beach Nourishment.** Alternative 2 consists of maintenance dredging of up to 165,000 cy of material over a 15-year period, with no more than 50,000 cy of material per dredge event, from the Keystone navigation channel. Disposal of the dredged material will occur on the adjacent previously used beach disposal site, which is approximately 2.5 acres (Figure 1). All the dredged sand and gravel will be used beneficially to re-nourish a section of the beach to the east of the breakwater. Dredging could be accomplished using either a clamshell or hydraulic dredge.

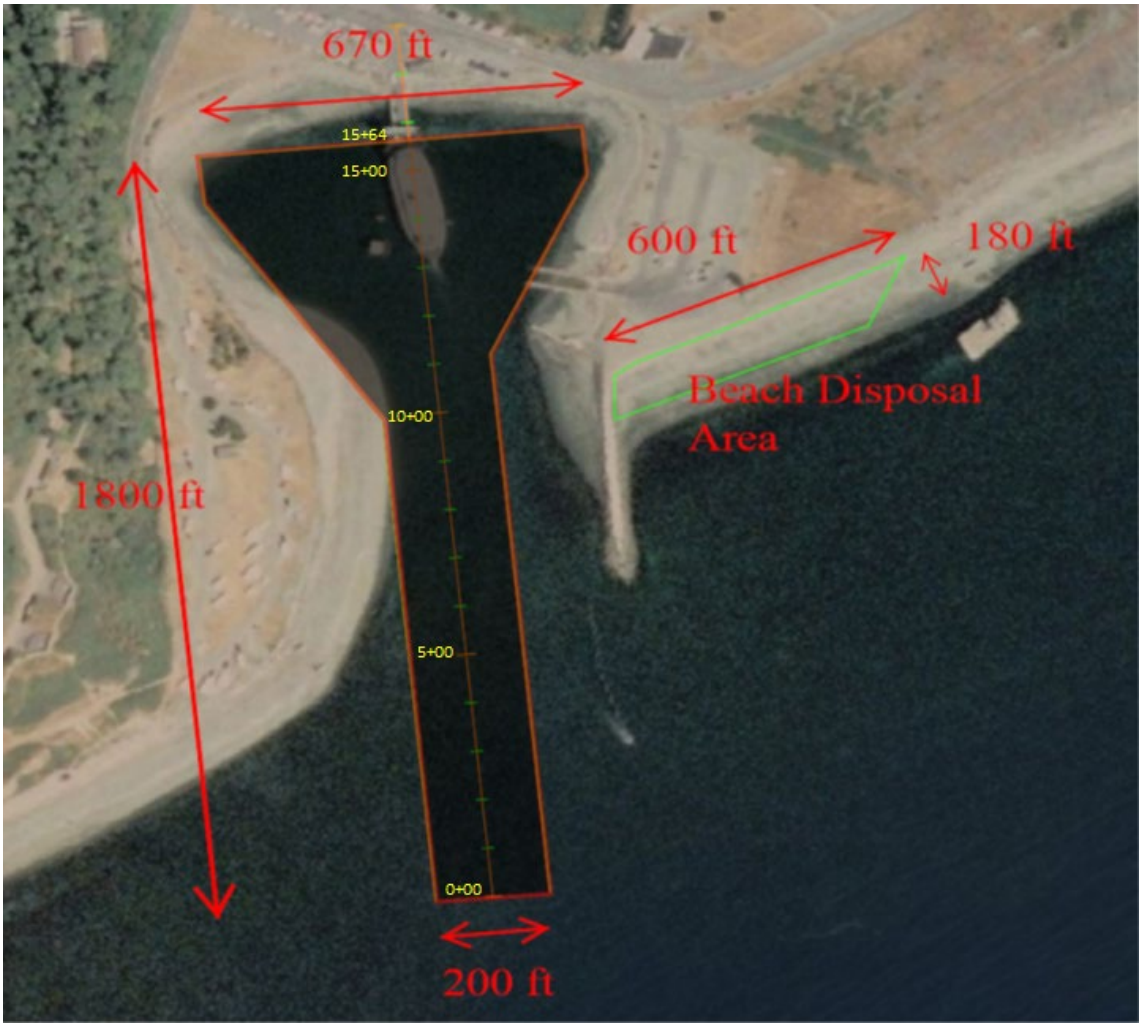

Figure 1. Plan view for Alternative 2.

For hydraulic dredging, the dredged material would be pumped to the adjacent beach area. To minimize turbidity, berms would be pushed up using onsite material to preclude effluent from flowing directly into receiving water without ponding/settling or filtering through the berm. A bulldozer or similar equipment would move the output pipeline along the placement area as material accumulates. For clamshell dredging, material will be placed on a barge. Once full, the barge will move to the shoreline on the east side of the harbor. The barge will transload the material using the derricks or other equipment onto a truck, or it will stockpile the material directly on the shoreline above MHHW. The contractor will then transfer the material to the beach and grade it with a bulldozer, front loader, or other equipment.

**c. Alternative 3 – Maintenance Dredging with Reduced Quantity.**
Under Alternative 3, dredging would occur as the clamshell method described in Alternative 2; however, USACE would place dredged material on a barge and transport it 14 miles away to an open-water dredged material disposal site (Figure 5 of the EA).

**Findings.** USACE rejected Alternative 1 because it would not meet the authorized project purpose and need. USACE rejected Alternative 3 because it does not address the erosion of the adjacent beach, and due to increased costs for hauling material offsite. USACE selected Alternative 2 because it meets the project purpose and the Federal standard, which is the option that represents the least costly alternative, at the most practicable location, consistent with sound engineering practices, that meets environmental standards established by the CWA 404(b)(1) evaluation process.

**5. Significant Degradation, Either Individually or Cumulatively, To the Aquatic Environment**

**a. Impacts on Ecosystem Function.** The disposal of dredged material onto the substrate within the footprint of the disposal sites would disturb beach and benthic habitat and would bury the less mobile benthic organisms. Potential effects would be localized to previously-disturbed areas solely within the footprint of the disposal site, short in duration as the benthic community recovers within several months, and minor in spatial scope limited to the designated area for receipt of dredged sediments. Turbidity impacts will be temporary and minimized by allowing the material to decant prior to placing on the beach.

**b. Impacts on Recreational, Aesthetic, and Economic Values.** Construction vehicles may temporarily disrupt local and tourist traffic at Keystone Harbor; however, no significant adverse effects on recreation, aesthetics, or the economy are anticipated, nor have these types of effect occurred during previous maintenance dredging operations. The placement of nourishment materials onto the beach will delay the conversion of the current high intertidal beach to a subtidal beach, thereby allowing for continued use of the shore for recreational purposes.

**Findings.** USACE has determined that there will be no significant adverse effects to aquatic ecosystem functions and values.

**6. Appropriate and Practicable Measures to Minimize Potential Harm to the Aquatic Ecosystem.**

**a. Impact Avoidance Measures.** Potential effects of the proposed work on the aquatic ecosystem will be avoided through the implementation of timing restrictions, and by avoiding unnecessary disturbance. Work will be done during the in-water work window of 16 July to 15 February to avoid sensitive species like salmon and bull trout.

**b. Impact Minimization Measures.** Beach nourishment material will be placed as high as possible in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable. The area of beach nourishment is limited to only 2.5 acres.

**c. Compensatory Mitigation Measures.** There would be no compensatory mitigation measures because the work would not have more than a negligible change to any habitat characteristics. An environmental assessment (EA) is being prepared per the National Environmental Policy Act (NEPA) that concludes that the action would not result in significant impacts to the human environment. Furthermore, the beach nourishment program is considered a benefit to the nearshore structure and function, and does not require compensatory mitigation.

**Findings.** USACE has determined that all appropriate and practicable measures have been taken to minimize potential harm.

**8. Other Factors in the Public Interest.**

**a. Fish and Wildlife.** USACE has coordinated with State and Federal agencies to assure careful consideration of fish and wildlife resources including the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and Washington Department of Ecology (WDOE), as well as the Lummi Nation, Jamestown S'Klallam, Port Gamble S'Klallam, Lower Elwha Klallam, Skokomish, Suquamish, Swinomish, and Tulalip Tribes, to assure careful consideration of fish and wildlife resources. The USACE submitted a Combined Project Biological Assessment for maintenance dredging, of which the Keystone dredging and disposal action is one component, to NMFS and USFWS. USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with USACE's effects determination of NLAA for Puget Sound Chinook and steelhead, and bocaccio critical habitat, and determined the proposed action "may affect and is likely to adversely affect" (LAA) these species (not

bocaccio) and their critical habitat, but would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018 for Puget Sound Chinook and steelhead.

An EFH determination for the maintenance dredging of the Keystone Harbor was included in the Combined Project Biological Assessment submitted to NMFS. The USACE has determined that maintenance dredging may adversely affect EFH for the entire maintenance dredging program, including Keystone Harbor, because removal of dredged material would constitute a detectable effect to EFH by disturbing the substrate and associated water quality impacts. NMFS concurred with this determination in a letter dated 26 January 2018 (Appendix A of the EA). NMFS listed seven conservation measures to minimize and/or avoid adverse impacts to EFH. USACE provided a detailed response to NMFS within 30 days as required by section 3.5(b)(4)(B) of the MSA that agreed with all conservation recommendations, except to return all woody debris to the waterway. For the measure regarding woody debris, standard practice is to dredge around large logs with or without root wad so that they remain in the water. Other woody debris is typically small fragments of trees, bushes, or scrap lumber, and not of the quality to be beneficially used. If this woody debris is larger than two feet in any dimension, it is separated from the dredged material and disposed of at an appropriate disposal facility.

**b. Water Quality.** Impacts to water quality are expected to be minor and temporary. The USACE is requesting a Section 401 Water Quality Certification from the Washington State Department of Ecology. The USACE would abide by the conditions in the Water Quality Certification to ensure compliance with State water quality standards.

**c. Historic and Cultural Resources.** Archaeological and historic site records at the Washington State Office of Archaeology and Historic Preservation (OAHP) were examined, and review of the proposed dredging finds that the activity would have no effect to known archaeological or cultural resources within the APE. No further archaeological work is recommended. A determination of effect letter is being prepared for SHPO review and concurrence. They would respond within 30 days. Tribal notification letters are being prepared and will be sent to the Swinomish Indian Tribal Community, Samish Tribe, Upper Skagit Tribe, and the Sauk-Suiattle Tribe. Notified tribes would review and comment within 30 days.

**d. Activities Affecting Coastal Zones.** The USACE is substantively consistent with the enforceable polices of the Island County Shoreline Master Programs and will provide documentation of this consistency determination to Ecology for their review.

**e. Environmental Benefits.** No substantial benefits to the environment have been identified as part of this proposed work.

**f. Navigation.** A minor, temporary disruption of navigation traffic may result from dredging and disposal operations. The dredge will not block the navigation channel but may impinge on the total width available to vessel traffic. Dredging will occur at night between the hours of 9pm and 5am to accommodate ferry traffic. Disposal of materials along the beach will typically take place during the day for clamshell dredging, but would not block access to Keystone Harbor. A Notice to Mariners will be issued before dredging and disposal operations are initiated.

**Findings.** USACE has determined that this project is within the public interest based on review of the public interest factors.

**9. Conclusions.** Based on the analyses presented in project NEPA and ESA documents, as well as the following 404(b)(1) Evaluation and General Policies for the Evaluation of Permit Applications analysis, USACE finds that this project complies with the substantive elements of Section 404 of the Clean Water Act.

**Clean Water Act Section 404(b)(1) Evaluation [40 CFR §230]**

## Potential Impacts on Physical and Chemical Characteristics (Subpart C)

**1. Substrate [230.20]** The material that shoals in Keystone Harbor is composed of sand and gravel (less than 3% fines) eroding naturally from unaltered bluffs to the west of the navigation channel. This material would have naturally deposited on the adjacent beach if not for the interruption of the littoral drift cell by the navigation channel. Placing the dredged material on the beach is a substitute for what would have naturally occurred.

**2. Suspended Particulate/Turbidity [230.21]** Any increases in turbidity resulting from the proposed action will be minor considering the large grain size of the nourishment material (less than 3% fines). Any sediment plumes attributable to the project will be temporary, localized, and equivalent to those created by natural sediment transport processes and by the regular ferry traffic in the harbor.

**3. Water Quality [230.22]** No significant water quality effects are anticipated (see number 2 above).

**4. Current Patterns and Water Circulation [230.23]** The discharge of nourishment materials will not obstruct flow, change the direction or velocity of water flow/circulation, or otherwise change the dimensions of the receiving water body. The beach nourishment material will slowly enter the longshore drift system as it erodes off the beach over several years.

**5. Normal Water Fluctuations [230.24]** The discharge of nourishment materials will not impede normal tidal fluctuations. Beach nourishment material will be placed as high as possible in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable. The proposed nourishment project will delay the conversion of the beach from a high intertidal beach to a subtidal beach.

**6. Salinity Gradients [230.25]** The discharge of nourishment materials will not divert or restrict tidal flows or affect salinity gradients (see number 5. above).

## Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

**1. Threatened and Endangered Species [230.30]** Pursuant to Section 7 of the Endangered Species Act, USACE submitted a Combined Project Biological Assessment for maintenance dredging, of which the Keystone dredging and disposal action is one component, to NMFS and USFWS. USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with USACE's effects determination of NLAA for Puget Sound Chinook and steelhead, and bocaccio critical habitat, and determined the proposed action "may affect and is likely to adversely affect" (LAA) these species (not bocaccio) and their critical habitat, but would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018 for Puget Sound Chinook and steelhead.

**2. Aquatic Food Web [230.31]** The proposed action is not expected to have a significant effect on the benthic habitat. The nourishment material will be placed upon the beach away from the kelp bed during mid-summer and early fall months. Algae are most vulnerable to sediment effects during spring months, when sporophyte growth is triggered by increasing light levels. The nourishment materials will have a coarse grain size and therefore are not expected to remain suspended in the water column for very long. This reduces the chance for sub-threshold light levels that could affect macroalgae growth rates or reproductive cycles.

The proposed action will affect epibenthic prey organisms, particularly gammarid amphipods, within and adjacent to the 2.5-acre beach nourishment footprint; however, amphipods are adapted to heavy disturbance regimes, and are thus expected to recolonize the nourishment area within a couple months.

The scale of mortality effects that will result from the proposed project is not likely to affect amphipod population dynamics or other benthic and epibenthic organisms in the project area. The nourishment material will be placed after the end of the juvenile salmonid outmigration period. This schedule will allow for maximum recovery of the epibenthos prior to the next salmonid outmigration.

Forage fish, such as herring, surf smelt, and sand lance, will not be directly affected by the proposed action because (a) placement of the nourishment materials will occur above the waterline at low tides so as not to directly interfere with fish usage of beach habitat, and (b) turbidity is not expected to increase substantially above ambient conditions due to the large grain size of the material. Indirect effects are not anticipated since NOAA-sponsored studies have shown that the epibenthic fauna that will be affected by material placement do not appear to constitute a significant fraction of these species' diet.

**3. Wildlife [230.32]** Noise associated with disposal operations may have an effect on bird and marine mammals in the project vicinity. The effects of any sound disturbance would likely result in displacement of animals rather than injury (see section 3.3.7 of the EA for more detail). Disposal operations are not expected to result in a long-term reduction in the abundance and distribution of any prey items. No breeding or nesting areas will be affected.

**Potential Impacts to Special Aquatic Sites (Subpart E)**

**1. Sanctuaries and Refuges [230.40]** There are no designated sanctuary or refuge area at or near the project area.

**2. Wetlands [230.41]** Nourishment material will not be discharged in wetland areas. The project will not alter the inundation patterns of wetlands in the project vicinity.

**3. Mudflats [230.42]** No mudflats occur in the project area.

**4. Vegetated Shallows [230.43]** A kelp bed stands offshore from the project area, so nourishment material will be discharged near but not adjacent to or in vegetated shallows. Turbidity associated with the placement of nourishment material is not expected to significantly affect this kelp bed (see Aquatic Food Web discussion above). The project will not change circulation patterns, increase nutrients, result in any chemical contamination, or change the capacity of the kelp to stabilize bottom materials. As described in the Aquatic Food Web section, the placement of nourishment materials is not expected to reduce the value of the area as nesting, spawning, nursery, cover, or forage habitat.

**5. Coral Reefs [230.44]** Not applicable.

**6. Riffle and Pool Complexes [230.45]** Not applicable.

**Potential Effects on Human Use Characteristics (Subpart F)**

**1. Municipal and Private Water Supplies [230.50]** Not applicable.

**2. Recreational and Commercial Fisheries [230.51]** The project is not expected to affect recreational or commercial fisheries.

**3. Water-Related Recreation [230.52]** Construction vehicles may briefly disrupt local and tourist traffic on Highway 20; however, the frontloader and dump truck that may be used will only be operating at the edge of the parking lot in Fort Casey State Park. Use of the beach areas in and directly adjacent to the stockpile footprint will be disallowed during construction for safety reasons. These effects will occur for an estimated 60 days in a relative small portion of the parking lot, so no significant adverse effects on recreation are anticipated.

**4. Aesthetics [230.53]** The stockpiles will not block views of Puget Sound or the Strait of Juan de Fuca from the vehicles traveling along the road. The stockpile area is expected to be indistinguishable from

adjacent areas shortly after project completion. The effect of the project on aesthetics will be discountable.

**5. Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves [230.54]** The beach nourishment site is located within the boundaries of the Ebey's Landing National Historical Reserve (NHR), which was created by Congress in 1978 as a unit of the National Park System. The beach nourishment site is also within Fort Casey State Park, which is a marine camping park that includes an underwater park for SCUBA diving. Beach nourishment helps to maintain the intertidal beach and jetty that hosts the abundance of marine life that makes the site popular among divers.

## Evaluation and Testing (Subpart G)

**1. General Evaluation of Dredged or Fill Material [230.60]** The fill material will be composed of sand, gravel, and other naturally occurring inert material obtained from the Keystone Harbor Federal Navigation Channel. Sediments were tested in 2011, according to Dredged Material Management Program (DMMP) protocol, and they determined that results indicated that that material dredged from Keystone Harbor is suitable for beach nourishment/beneficial use (USACE 2011). This sediment suitability determination (SSD) expired in 2018. Another round of testing is currently underway, with an anticipated SSD completion date in spring of 2020. Based on the 2011 SSD, USACE expects a determination that that the material is clean and suitable for beneficial use. Contaminants do not adhere to the grain size (sand/gravel) of the material present at the site. Furthermore, the dredging/disposal site is in a highly dynamic littoral drift current/tidal area, and is free from any known sources of contamination. If the 2020 SSD determines the material is clean and suitability for beneficial use, then the project will be downgraded and only require conformity testing every ten years.

**2. Chemical, Biological, and Physical Evaluation and Testing [230.61]** Sediments have been previously tested according to Puget Sound Dredged Disposal Analysis (PSDDA) protocols. Another round is currently underway and results will be complete upon the finalization of this document.

## Action to Minimize Adverse Effects (Subpart H)

**1. Actions Concerning the Location of the Discharge [230.70]** The stockpile site has been used previously for similar discharge. The beach nourishment will not disrupt tidal flows, nor create standing bodies of water. The substrate of the discharge is similar to the receiving beach and would have been deposited there naturally but for the interruption of the shoreline by the navigation channel. The location and timing of the discharge has been planned to minimize effects to marine organisms.

**2. Actions Concerning the Material to be Discharged [230.71]** No treatment substances nor chemical flocculates will be added to the nourishment materials before disposal. The DMMP agencies have determined in 2011 that sediment to be dredged from Keystone Harbor is suitable for open-water disposal and beach nourishment, and there were no screening level exceedances for chemicals of concern. Another round of testing is underway and results will be complete upon the finalization of this document.

**3. Actions Controlling the Material after Discharge [230.72]** Methods for reducing the potential for erosion, slumping, or leaching will not be employed, as the intent of the action is to introduce material into littoral transport along the project area. The material will be piled high enough out of the water to allow for decanting of turbid water on the beach before it reaches the aquatic environment.

**4. Actions Affecting the Method of Dispersion [230.73]** Beach nourishment material will be placed as high as possible in the intertidal zone, thereby mimicking natural sediment erosion and transport processes to the maximum extent practicable. The material placement locations will make use of currents and circulation patterns to disperse the discharge.

**5. Actions Related to Technology [230.74]** Appropriate machinery and methods of transport of the material for discharge will be employed. All machinery will be properly maintained and operated.

**6. Actions Affecting Plant and Animal Populations [230.75]** The timing of the proposed discharge operations will minimize the potential for adverse effects to animal populations, particularly juvenile salmonids. As the nourishment stockpiles erode and reduce the slope of the beach, the prime elevation range for intertidal epibenthic invertebrates upon which juvenile salmonids prey, approximately 1 to 7 feet above MLLW, should increase in area. There will be a short-term reduction in densities of organisms like gammarid amphipods, the production will recover to the previous population level within a few months. Any resulting increases in epibenthic productivity could benefit salmonids.

**7. Actions Affecting Human Use [230.76]** The discharge will not result in damage to aesthetically pleasing features of the aquatic landscape. The discharge will not increase incompatible human activity in remote fish and wildlife areas.

**8. Other Actions [230.77]** Not applicable.

**General Policies for the Evaluation of Public Interest [33 CFR §320.4 asreference** for application to Civil Works project by analogy**]**

**1. Public Interest Review [320.4(a)]** USACE finds these actions to be in compliance with the 404(b)(1) guidelines and not contrary to the public interest.

**2. Effects on Wetlands [320.4(b)]** No wetlands will be altered by the placement of materials from dredging.

**3. Fish and Wildlife [320.4(c)]** USACE consulted with Federal and State agencies and local tribes to ensure that direct and indirect loss and damage to fish and wildlife resources attributable to the proposed maintenance work will be minimized. This list of contacted agencies includes the following:

- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Washington Department of Fish and Wildlife
- Washington State Department of Ecology
- Jamestown S'Klallam Tribe
- Lower Elwha Klallam Tribe
- Lummi Nation
- Port Gamble S'Klallam Tribe
- Suquamish Tribe
- Skokomish Tribe
- Swinomish Tribe
- Tulalip Tribe

**4. Water Quality [320.4(d)]** USACE will abide by the conditions of the Section 401 Water Quality Certification for disposal issued by the Department of Ecology to ensure compliance with Washington water quality standards.

**5. Historic, Cultural, Scenic, and Recreational Values [320.4(e)]** No wild and scenic rivers, historic properties, National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreation Areas, National Lakeshores, National Parks, National Monuments, estuarine and marine sanctuaries, or archeological resources will be adversely affected by the proposed maintenance work. The maintenance of a gently graded beach profile will maintain recreation values.

**6. Effects on Limits of the Territorial Sea [320.4(f)]** The proposed maintenance work will not alter the coastline or baseline from which the territorial sea is measured for the purposes of the Submerged Lands Act and international law.

**7. Consideration of Property Ownership [320.4(g)]** Not applicable.

**8. Activities Affecting Coastal Zones [320.4(h)]** The proposed work complies with the shoreline use regulations specified in the Island Shoreline Master Program, as adopted in June 2001.

**9. Activities in Marine Sanctuaries [320.4(i)]** Not applicable.

**10. Other Federal, State, or Local Requirements [320.4(j)]** USACE has analyzed the proposed action under all applicable Federal, State, and local requirements and documented this compliance in the Environmental Assessment. They are summarized below:

**a. National Environmental Policy Act.** An Environmental Assessment (EA) has been prepared to satisfy the documentation requirements of NEPA. Following a 30-day public review and comment period, the USACE will determine whether preparation of an Environmental Impact Statement is warranted.

**b. Endangered Species Act.** In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed threatened or endangered species. The USACE submitted a Combined-Projects Biological Assessment (BA) for maintenance dredging, of which this dredging and placement action is one component, to NMFS and USFWS (the Services). USFWS concurred with USACE's determination of "may affect, not likely to adversely affect" (NLAA) for bull trout and their critical habitat, and marbled murrelet on 24 May 2017. NMFS did not concur with all of USACE's effects determinations of NLAA, but did determine that action would not cause jeopardy to these species or adversely modify their critical habitat. NMFS issued a Biological Opinion (2018 BiOp) with an incidental take statement to USACE on 26 January 2018 (see Appendix A of the draft EA).

**c. Clean Water Act.** The USACE must demonstrate compliance with the substantive requirements of the Clean Water Act. This document records the USACE's evaluation and findings regarding this project pursuant to Section 404 of the Act. The USACE will provide a Joint Aquatic Resources Permit form and other supporting documents as the basis for requesting a Section 401 Water Quality Certification from the Washington State Department of Ecology. The USACE will abide by applicable conditions of the Water Quality Certification associated with the discharge of dredged material into the waters of the U.S. to ensure compliance with water quality standards.

**d. Coastal Zone Management Act.** The Coastal Zone Management Act of 1972 (CZMA), as amended, requires Federal agencies to carry out their activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved Coastal Zone Management Program. The proposed action is considered consistent to the maximum extent practicable with the State Program.

**e. Marine Protection, Research, and Sanctuaries Act.** Section 102 of the Marine Protection, Research, and Sanctuaries Act (MPRSA) authorizes the EPA to promulgate ocean dumping criteria and designate ocean disposal sites. This project will not involve ocean disposal of dredged material.

**f. National Historic Preservation Act.** The National Historic Preservation Act (16 USC 470) requires that the effects of proposed actions on sites, buildings, structures, or objects included or eligible for the National Register of Historic Places must be identified and evaluated. USACE, Seattle District has reviewed the proposed action and conducted an analysis in accordance with Section 106 of the NHPA's implementing regulations at 36 C.F.R.§ 800. Review of the proposed dredging finds

that the activity would have no effect to known archaeological or cultural resources within the APE. No further archaeological work is recommended. A determination of effect letter is being prepared for SHPO review and concurrence. They would respond within 30 days. Tribal notification letters are being prepared and will be sent to the Swinomish Indian Tribal Community, Samish Tribe, Upper Skagit Tribe, and the Sauk-Suiattle Tribe. Notified tribes will review and comment within 30 days. This determination completes the NHPA process.

**g. Fish and Wildlife Coordination Act.** The Fish and Wildlife Coordination Act (16 USC 470) requires that wildlife conservation receive equal consideration and be coordinated with other features of water resource development projects. A Fish and Wildlife Coordination Act Report (FWCA) is not required for the proposed disposal of sediments because the FWCA does not apply to operations and maintenance activities on existing projects.

**11. Safety of Impoundment Structures [320.4(k)]** Not applicable.

**12. Floodplain Management [320.4(l)]** The proposed maintenance work will not alter any floodplain areas.

**13. Water Supply and Conservation [320.4(m)]** Not applicable.

**14. Energy Conservation and Development [320.4(n)]** Not applicable.

**15. Navigation [320.4(o)]** One of the purposes for the beach nourishment is to prevent erosion from undermining the rock jetty structure that protects the harbor from direct wave action and aids in preventing excessive shoaling in the navigation channel. No adverse effects to navigation will result from the proposed maintenance work.

**16. Environmental Benefits [320.4(p)]** The proposed nourishment project will delay the conversion of the beach from a high intertidal beach to a subtidal beach. The maintenance of a higher, more gently graded beach profile will maintain the range of intertidal elevations necessary to support the epibenthic invertebrates that serve as prey for a wide variety of marine fishes.

**17. Economics [320.4(q)]** Placement of dredged material as beach nourishment is the least cost location for disposal. Completion of the project will enable the recreation area including the restroom facility at Fort Casey State Park to remain open and functional, to continue serving the local and regional public. USACE finds this project is economically justified.

**18. Mitigation [320.49(r)]** Potential effects of the maintenance work on salmonids will be avoided through implementation of timing restrictions. For the protection of these species, work will occur between 16 July and 15 February. Placement of native materials on the beach will prevent shoreline erosion and downgrading of the beach.

# Appendix D – Coastal Zone Management Act Consistency Determination

# COASTAL ZONE MANAGEMENT ACT
# CONSISTENCY DETERMINATION

**Keystone Harbor**
**Fiscal Year 2020 through FY 2035[1]**
**Maintenance Dredging and Disposal**
**Island County, Washington**

**Submitted by the U.S. Army Corps of Engineers,**

**Seattle District**

US Army Corps
of Engineers®
Seattle District

January 2020

[1] FY (fiscal years) span from 1 October to 30 September. This document covers dredging events from 16 July 2020 to 15 February 2035 (these dates are associated with the in-water work window)

# 1 INTRODUCTION AND PROJECT DESCRIPTION

The Coastal Zone Management Act of 1972, as amended, requires Federal agencies to carry out their activities in a manner that is consistent to the maximum extent practicable with the enforceable policies of the approved state Coastal Zone Management (CZM) Programs. The Shoreline Management Act of 1972 (SMA; RCW 90.58) is the core of Washington's CZM Program. Primary responsibility for the implementation of the SMA is assigned to the local government.

According to 15 CFR Ch. IX § 930.30, the Federal Government is directed to ensure "that all Federal agency activities including development projects affecting any coastal use or resource will be undertaken in a manner consistent to the maximum extent practicable with the enforceable policies of approved management programs." The Keystone Harbor Dredging and Disposal project occurs within the coastal zone governed by the Island County Comprehensive Plan, Chapter 17.05A Shoreline Master Program Regulations and Policies.

Maintenance dredging and disposal are activities undertaken by a Federal agency; the following constitutes a Federal consistency determination with the enforceable provisions of the Washington Coastal Zone Management Program.

## 1.1 Authority

The Keystone Harbor Project is authorized by several acts that together created the current authorized project scope. The Department of the Army Lake Crockett navigation project and maintenance dredging was authorized by the River and Harbor Act of 2 March 1945 (House Document 303, 77$^{th}$ Congress, 1$^{st}$ Session). In 1971, the project was widened under authority of Section 107 of the 1960 Water Resources Development Act. In 1993, the project was deepened by authority of Section 107 of the 1960 Water Resources Development Act as amended by Section 915 of the Water Resources Development Act of 17 November 1986 (Public Law 99 662).

This artificial harbor is a dredged basin originally constructed by the U.S. Army Corps of Engineers (USACE) in 1947-48 and modified in 1971 and 1993. USACE constructed the harbor by dredging a triangular shaped bay from an existing barrier beach, and connected the harbor to Admiralty Bay with a navigation channel. USACE built a stone breakwater on the eastern side of the harbor. The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. The channel is designed to be 1,800 feet long, 200 feet wide, and 25 feet below Mean Lower Low Water (MLLW), herein notated as -25 MLLW, with two feet of authorized overdepth. This allows safe navigation for the ferries to dock during tides as low as -4.5 MLLW.

## 1.2 Action Area

Keystone Harbor is located in northern Puget Sound on the west side of Whidbey Island in Island County, Washington (T31N, R1E, Sections 22, 23, and 24). Keystone Harbor is the eastern terminal of the Port Townsend/Coupeville ferry route (Figure 1). The navigation channel connects Admiralty Inlet to the Washington State Ferry terminal (Figure 2). The Harbor is surrounded by Ebey's Landing National Historic Reserve and by Fort Casey State Park. Lake Crockett lies to the northeast across State Route 20, and is connected hydraulically to the harbor through a culvert with a tidegate.

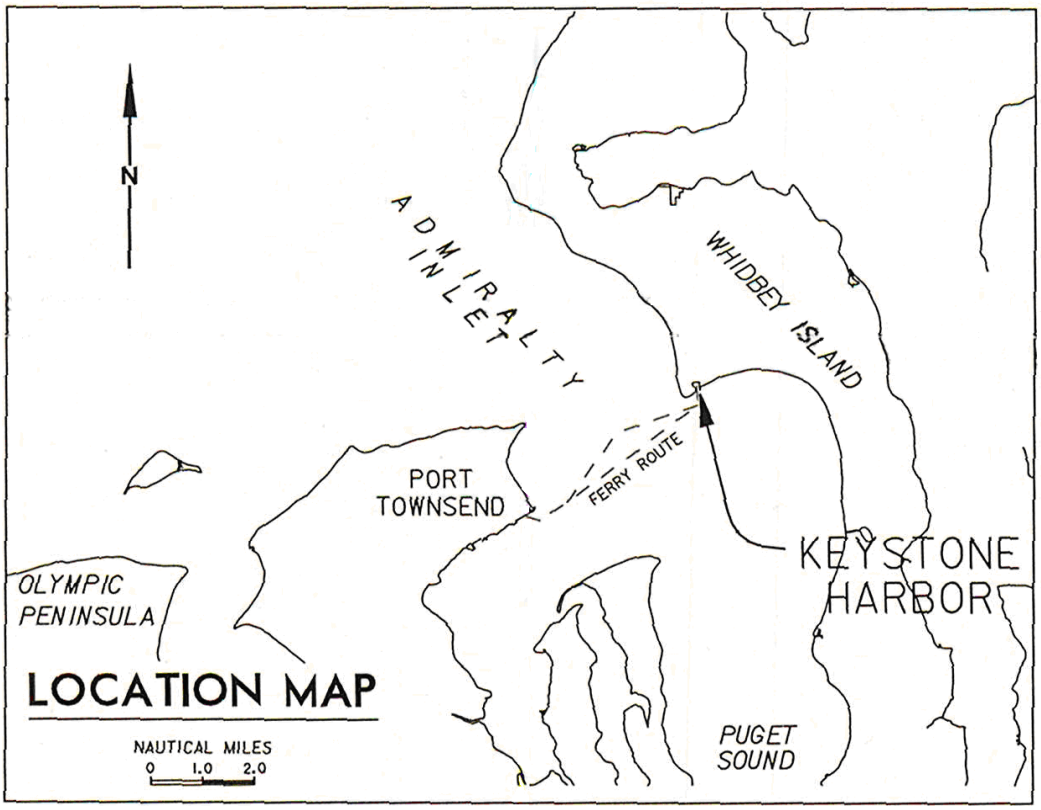


**Figure 1. Project location.**


**Figure 2. Aerial photograph of Keystone Harbor taken 5 May 1993 (photo courtesy of the Washington Department of Ecology).**

### 1.3 Background

The basin provides a harbor of refuge, a boat launch ramp, and a terminal for the Washington State ferry run between the city of Port Townsend and Whidbey Island. When the channel and ferry slip become too shallow, the ferry must cancel sailings, and the ferry has run aground during landings at low tide. This limits service on the Port Townsend/Coupeville run. The purpose of the beach disposal component of the project is to prevent erosion to the point of undermining the jetty and losing park infrastructure.

*Navigation Conditions*

Strong cross-currents, narrow channel width, and wind-generated waves combine to make Keystone Harbor the most difficult of all Washington State ferry terminals to enter. Vessel operators typically bring a ferry into the channel at full speed and, after the stern of the vessel is out of the influence of the cross-current, apply full reverse to begin the docking maneuver. At low tide, there is insufficient water under the hull of a 13.5-foot-draft ferry to maintain vessel control. Propeller cavitation can occur with resulting loss of thrust and rudder "bite," and the vessel may drift and run aground. Propeller clearance requires at least 7 feet for vessel control. With continued shoaling of the channel, the risk of ferry vessel groundings at moderate and lower tides increases dramatically. In addition, continued shoaling could limit the ability of Keystone Harbor to serve as a harbor of refuge.

*Beach Erosion*

The navigation project interrupts the natural littoral drift process. This results in gradual erosion of the harbor features and related recreation facilities. Continued erosion risks undermining the east jetty, an essential feature of the Federal navigation project. Over several years, severe erosion can occur on the adjacent beach to the east and can undermine the Washington State Park's restroom facilities, picnic areas, parking lot, and recreational boat launch.

## 2 PURPOSE

The purpose of this project is to provide necessary safe navigation conditions for the Washington State Ferry System vessels to dock at Keystone Harbor for uninterrupted service on the Port Townsend/Coupeville ferry route, and to ensure continuity of the sediment transport processes along the shoreline in the project area.

## 3 PROPOSED ACTION

While some dredge events will be much less, maintenance dredging consists of removing up to 50,000 cubic yards (CY) of material per event from the Keystone navigation channel from stations 0+00 to 15+00, with a maximum of five dredge events totaling 165,000 CY over the 15-year period (Figure 3). The method will be either mechanical dredging with material placed on a barge or hydraulic pipeline dredging. Disposal of the dredged material will occur on the adjacent previously used beach disposal site, which is approximately 2.5 acres. All the dredged sand and gravel will be used beneficially to re-nourish a section of the beach to the breakwater (Figure 3). Extreme ends of the beach disposal site and the disposal site baseline will be staked in the field. Dredged material will be placed water-ward, starting from the existing beach and graded uniformly to the existing grade. The method used to deposit material on the beach depends on the dredge equipment. USACE expects the duration of dredging and disposal to take up to 60 days. Dredging will take place at night from 9pm to 5am to accommodate ferry traffic. Material placement will typically take place during the daylight hours for clamshell dredging, and night time hours for hydraulic dredging. Dredging and disposal will occur within the approved Washington Department of Fish and Wildlife in-water construction window of 16 July to 15 February.


**Figure 3. Plan view of proposed dredging and disposal footprint.**

The following activities will occur in Keystone Harbor and the adjacent beach to the South:

**Mechanical Dredging**

A mechanical (clamshell) dredge operation includes a dredge barge with a deck-mounted crane, a clamshell bucket, at least one tugboat, and at least one sediment transport barge. Bucket capacity ranges from two to 25 CY. During active dredging, a transport barge is tied to the dredge barge. The clamshell dredge (a type of mechanical dredge) uses a bucket deployed by a crane (derrick), mounted on a dredge barge, to remove the sediment. The bucket is sufficiently heavy to sink into the substrate. The dredge bucket has two jaws that are hinged in such a fashion that the bucket is open while descending through the water column (Figure 4). After closing, the top portion of the bucket remains open as the bucket is retrieved. A "controlled lowering" of the bucket reduces turbulence and the amount of suspended sediment generated. After the bucket penetrates the substrate, the bucket is closed, taking a "bite" out of

the substrate. The bucket is retrieved and swung over to a transport barge where the sediment is placed for transport to a disposal site. With the top and/or bottom of the bucket open, the probability of catching and retaining mobile organisms is minimal.

The dredge barge is equipped with vertical steel pipes, called spuds that are sunk into the substrate to anchor the dredge barge in one location. To move the dredge barge, the spuds are retrieved and a tug moves the dredge barge to a new location. The spuds are sunk again into the substrate to secure the dredge barge and dredging continues. Dredge barges are not self-propelled, but some dredge barges can move short distances by setting the dredge bucket into the substrate, retrieving the spuds, then pulling on the dredge bucket cable, and then inserting the spuds in the new location.

Once full, the barge will move to the shoreline on the east side of the harbor. The barge will transload the material using the derricks or other equipment onto a truck, or it will stockpile the material directly on the shoreline above mean higher high water. The contractor will then transfer the material to the beach and grade it with a bulldozer, front loader, or other equipment.

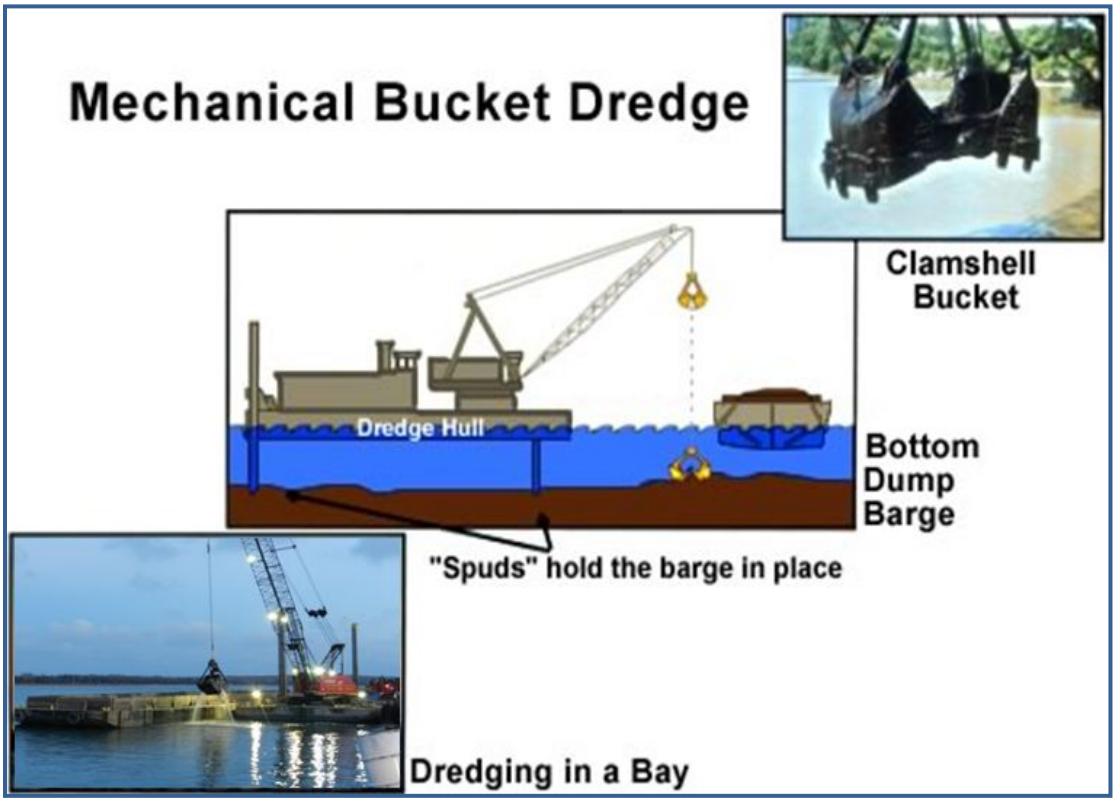


**Figure 4. Rendering of a mechanical dredge barge and bottom dump barge, with photographs of a mechanical (clamshell) dredge bucket and an operating mechanical dredge barge. Note that a bottom dump dredge would not be used for this action.**

**Hydraulic Dredging**

A hydraulic pipeline dredge employs a barge mounted centrifugal pump, intake pipe outfitted with a cutterhead, and a discharge pipe (Figures 5 and 6). The intake pipe is made of steel and is attached to the pump via a flexible joint. A rotating cutterhead is attached to the intake end of the pipe and is used to "agitate" sediment into a slurry. The intake pipe is suspended from a structure by an "A" frame, also known as a "ladder," fixed to the barge. The cutterhead and intake pipe are attached to the narrow end of the ladder and are lowered to, and in some cases, into the substrate. The depth of the cutterhead is controlled by raising and lowering the cutterhead. The depth a hydraulic pipeline dredge can reach is determined by the ladder length and the pumping (lifting) capability. The cutterhead is generally three to four times the diameter of the intake to the pipeline. As the cutterhead rotates and cuts into the substrate, suction created by the pump draws water and sediment into the intake pipe. A 12-inch dredge might have a 36-inch to 48-inch diameter cutterhead. The size of a cutterhead dredge is determined by the diameter of the outlet pipe of the dredge.

The machinery that powers the hydraulic dredge is located in the barge (Figure 6 of the EA). To function properly, the hydraulic pipeline dredge must take in a slurry of water and sediment. The dredge barge is not self-propelled but can be moved short distances using anchors and spuds. A small tender vessel sets the anchors. A spud at the opposite end of the barge from the cutterhead is set and the anchor winches retrieve the anchor lines in such a way that the dredge pivots on the set spud sweeping the cutterhead across the area to be dredged. At the end of the sweep, another spud is set, the first spud is retrieved, and the anchor line process is repeated sweeping the cutterhead across the area to be dredged in the opposite direction. In this fashion, the dredge moves forward. A tender vessel redeploys the anchors as needed, again facilitating forward movement of the support dredge. A variation on this theme is a barge with a "walking" spud. In this case, a spud is located in a slot along the centerline of the barge at the end opposite the cutterhead. To move the barge forward or backward, the spud is used as a stationary point and the barge pushes or pulls against the spud. The anchors and anchor lines are still necessary to pivot the support barge during maintenance dredging.

To summarize, a hydraulic dredge operation includes a support barge with an "A" frame (ladder), and a tender vessel or a tugboat to move the support barge into position.


**Figure 5. Small Hydraulic Dredge, Barge, and Machinery that Powers the Hydraulic Dredge**

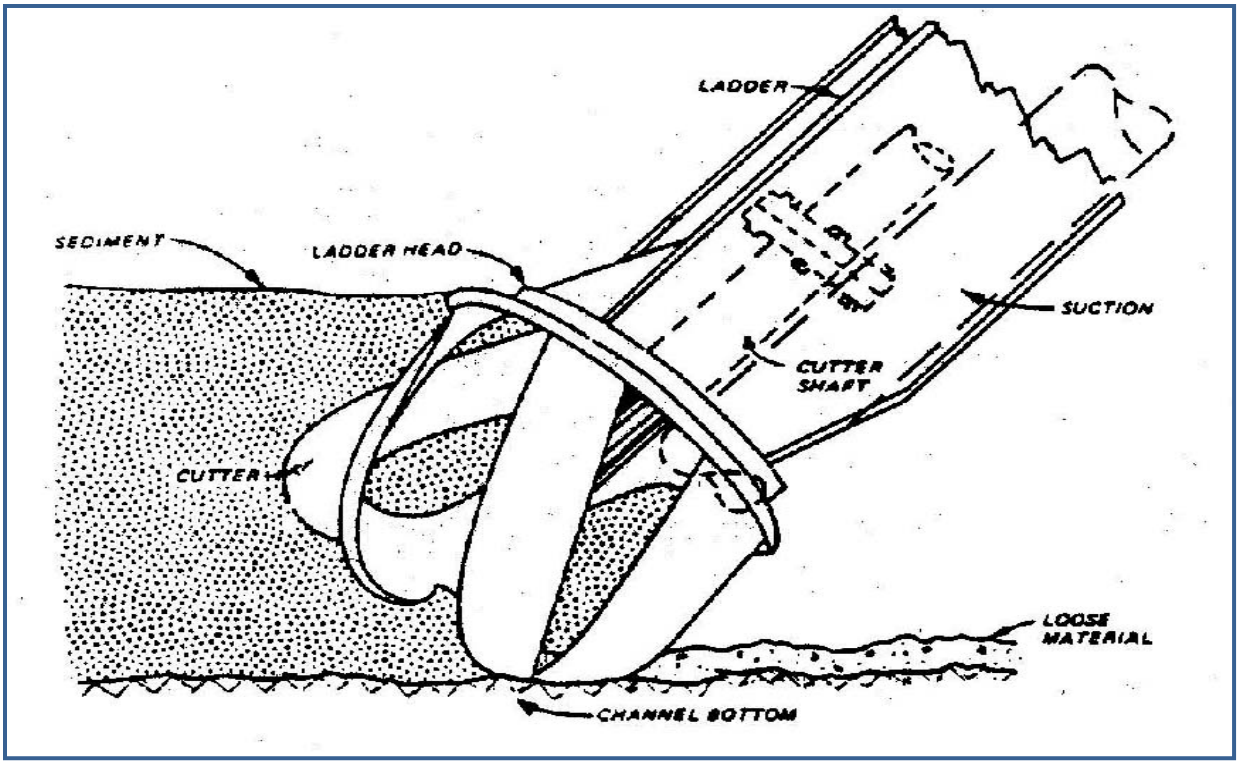


**Figure 6. Cutterhead in Operation, Including the Major Components**

The dredged material would be pumped to the adjacent beach area. To minimize turbidity, berms would be pushed up using onsite material to preclude effluent from flowing directly into receiving water without

ponding/settling or filtering through the berm. A bulldozer or similar equipment would move the output pipeline along the placement area as material accumulates.

# 4 JURISDICTION AND CONSISTENCY REQUIREMENTS

Washington's CZM Program defines the State's coastal zone to include the 15 counties with marine shorelines, which includes Whatcom County. Primary responsibility for the implementation of the SMA is assigned to local government. Island County, in which the proposed maintenance dredging will occur, fulfilled this requirement with the Shoreline Master Program (SMP) in its Comprehensive Plan. Island County has elected to implement the SMA, Chapter 90.58 RCW, through the adoption of goals and policies in chapter 17.05A (Shoreline Master Program Regulations and Policies) of its Comprehensive Plan, which was approved by the Washington State Department of Ecology (Ecology) in 2016.

The proposed maintenance dredging location is Keystone Harbor, located in Admiralty Bay, and designated in the Island County's SMP and is designated as High Intensity. Admiralty Bay is a Shoreline of Statewide Significance seaward of extreme low tide.

## 4.1 Consistency Requirements

USACE is seeking state concurrence with the Coastal Zone Management Act (CZMA) Consistency Determination for the proposed routine maintenance dredging from Ecology per CZMA Section 307 (c) and 15 CFR 923.33 (a) & (b). Under Washington's program, Federal projects that would affect land use, water use, or natural resources strive to demonstrate consistency with the policies of these four laws. Each of these laws is addressed below.

### *4.1.1 State Water Pollution Control Act*

The proposed action is consistent to the maximum extent practicable with the State Water Pollution Control Act. The project will implement best management practices to protect water quality. USACE is seeking a 401 Water Quality Certification (WQC) from Ecology.. WQCs under Section 401 of the Act for discharges of dredged or fill material into the waters of the U.S. assures compliance with state water quality standards.

USACE has also prepared a 404(b)(1) evaluation to document findings regarding this project pursuant to Section 404 of the Act. USACE is preparing and will distribute a Section 404 public notice for public comment as part of an Environmental Assessment prepared for this project. Dredged material will be discharged at an adjacent beach to the south that would otherwise erode from lack of sediment input due to the jetty and dredging of the harbor. No wetlands would be affected by the project.

### *4.1.2 Washington State Clean Air Act*

USACE reviewed Washington Administrative Codes WAC 173.400 through 173.495 and confirmed the project is consistent with the Washington State Clean Air Act. Furthermore, the project is in compliance with the adopted Federal rules. Section 176 of the Clean Air Act (CAA), 42 USC 7506(c), prohibits Federal agencies from approving any action that does not conform to an approved state or Federal implementation plan. Activities during the project would have short term localized effects to air quality

and noise. There would be a temporary increase in emissions and noise during equipment operation. Maintenance dredging and disposal activities will occur in an attainment zone, therefore *de minimus* thresholds and conformity determination requirements do not apply [40 CFR 93.153 (c)(2)(ix)].

### *4.1.3 State Ocean Resources Management Act*

The enforceable policies of Chapter 43.143 RCW apply to coastal waters of the Pacific Ocean. The proposed action does not include sites in or near the Pacific Ocean.

### *4.1.4 Shoreline Management Act*

The Washington Department of Ecology enforces the following policies under the State Shoreline Management Act:

- Washington Administrative Code (WAC) 173-15: Oil and Natural Gas Exploration Permits: This project does not include the exploration of oil or natural gas and therefore does not apply to the proposed action.
- Washington Administrative Code (WAC) 173-18: Rivers within Shoreline jurisdiction: The project area is not in or near a river. Therefore, this code does not apply to the proposed action.
- Washington Administrative Code (WAC) 173-20: Lakes within Shoreline jurisdiction: This project does not include shoreline adjacent to a lake. Therefore, it does not apply to the proposed action.
- Washington Administrative Code (WAC) 173-22: Wetlands: The project does not occur in a wetland. Therefore, it does not apply to the proposed action.
- Washington Administrative Code (WAC 173-27): Permit Enforcement: This project falls within the boundary of Island County. The Coastal Zone Management Act does not require Federal agencies to obtain local permits. However, USACE has, to the best of its ability, demonstrated consistency with chapter 17.05A of the Island County Comprehensive Plan and all applicable policies and regulations for shorelines of the state.

The determination of consistency with the CZMA for this proposed action is based on review of the policies and standards of the Island County Comprehensive Plan (chapter 17.05A) as defined in RCW 90.58 and WAC Chapter 173-26. Applicable sections are presented below with USACE's consistency determination in bold italics.

# 5 CONSISTENCY DETERMINATION

## 5.1 Island County Shoreline Master Program

The Island County SMP appears in their Comprehensive Plan and includes goals, policies, and regulations. The general purpose, goals, and policies are in Chapter 17.05A. Together they provide direction and context for the specific policies and regulations in the Program. Policies are broad statements of intention. In contrast, regulations are requirements that are necessary to implement the policies. The shoreline designations determine which uses are allowed, which are conditional, and which are prohibited in shoreline areas.

Each relevant section of the Island County SMP appears below with USACE's description of how the proposed Federal action is consistent with the code in ***bold italic*** text.

**CHAPTER 17.05A Shoreline Master Program Regulations and Procedures**

**17.05A.060 Shoreline Environment Designations and Maps**

B. Shorelines shall be categorized into Shoreline Environment Designations using the following six designations: Aquatic, Natural, Rural Conservancy, Urban Conservancy, Shoreline Residential, and High Intensity. The Shoreline Residential designation includes the sub-designations of Shoreline Residential-Canal Community and Shoreline Residential-Historic Beach Community. For each shoreline designation, this section establishes the purpose and the criteria that are to be applied in establishing the extent of each designation.

***All of Keystone Harbor, and the adjacent beach to the south of the jetty where the material will be placed, is mapped as a High Intensity shoreline.***


Figure 7. Interactive Shoreline Designation Map for Keystone Marina from Island County SMP

I. High Intensity Shoreline Environment Designation

1. Purpose: The purpose of the High Intensity designation is to provide for high intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and, where feasible, restoring ecological functions in areas that have been previously degraded.

2. Criteria for Designation: Areas designated High Intensity should include only areas that currently support water-dependent uses related to commercial boatyards and marinas, transportation or navigation facilities, or are suitable and needed to accommodate similar water-oriented uses in the next twenty years.

***Consistent: The proposed action involves maintenance dredging of a constructed harbor that serves as a ferry terminal. Placement of materials along the beach will provide sediment to an area that would otherwise erode due to interruption of littoral drift caused by the jetty and dredging of the harbor.***

**17.05A.080 Shoreline Use Classification**

The Shoreline Master Program's shoreline uses and developments shall be classified as follows:

**Permitted Uses and Developments** – Uses and developments that are consistent with this Program and RCW 90.58. Such uses or developments shall require a shoreline substantial development permit, a shoreline conditional use permit, a shoreline variance, or a statement that the use or development is exempt from a shoreline substantial development permit.

**Prohibited Uses and Developments** – Uses and developments that are inconsistent with this Program or RCW 90.58 and cannot be allowed through any permit.

***Consistent: Dredging is a permitted use in high intensity development shorelines.***

**17.05A.090 Shoreline Use and Development Regulations**

All developments and uses located within the jurisdiction of this Shoreline Master Program shall comply with all the regulations of this section.

A. General Shoreline Development Standards

6. All shoreline developments and uses shall be located, designed, constructed, and managed to avoid disturbance of or minimize adverse impacts to Fish and Wildlife Habitat Conservation Areas including, but not limited to spawning, nesting, rearing and habitat areas, and migratory routes. Where avoidance of adverse impacts is not practicable, the Shoreline Administrator may require that mitigation measures to protect species and habitat functions be developed in consultation with state resource management agencies and federally recognized tribes, as needed.

***Consistent: Disturbance to Fish and Wildlife Habitat Conservation areas will be temporary, including elevated turbidity and noise. USACE will conduct dredging operations during the prescribed work window of 16 July through 15 February to avoid impacts to sensitive species and will monitor water quality during the dredging and placement of materials to adhere to conditions in the WQC from Ecology. The affected Tribes and natural resource managers are being notified of the proposed action. No mitigation is proposed as it is maintenance dredging of an existing navigation channel.***

8. The release of oil, chemicals, or other hazardous materials onto or into the water shall be prohibited. Equipment for the transportation, storage, handling, or application of such materials shall be maintained in a safe and leak proof condition. If there is evidence of leakage, the further use of such equipment shall be suspended until the deficiency has been corrected.

***Consistent: All in-water equipment will be suitable for the marine environment and free from leaks.***

11. All shoreline developments and uses shall be located, designed, constructed, and managed to minimize interference with or adverse impacts to beneficial natural shoreline processes such as water circulation, erosion, and accretion.

***Consistent: The original construction of Keystone Harbor and the jetty on the south end interrupts littoral drift. The placement of the materials on the beach prevents the erosion and subsequent downgrading of the beach.***

12. All shoreline developments and uses shall be located, designed, constructed, and managed in a manner that minimizes adverse impacts to surrounding land and water uses and is compatible with the affected area.

***Consistent: No impacts to surrounding uses will occur as a result of the proposed action. Maintenance dredging will allow continued Washington State Ferry service to Whidbey Island, and placement of the material along the beach will prevent erosion of the shoreline and downgrading of the beach so recreation can continue.***

13. All development activities shall be located and designed to minimize or prevent the need for shoreline defense and stabilization measures and flood protection works such as bulkheads, other bank stabilization, landfills, levees, dikes, groins, jetties, or substantial site regrading.

Consistent: ***Placement of materials along the beach will provide sediment to an area that would otherwise erode due to interruption of littoral drift caused by the jetty and dredging of the harbor, thus preventing the need for stabilization structures.***

16. Navigation channels shall be kept free of hazardous or obstructing development or uses.

***Consistent: The project purpose is to restore the channel to its authorized depth so it can provide ferry access to Whidbey Island.***

17. Development and use of the shoreline shall be conducted in such a manner that unreasonable levels of noise, light, or glare will not intrude into adjacent areas. Shoreline activities may be restricted to reasonable hours and days of operation when necessary to protect residents and properties from adverse impacts such as noise, light, and glare.

***Consistent: There will be elevated noise and light associated with the dredging and disposal of material, but the impacts will be temporary. Overnight noise is likely since dredging will take place***

***from 9pm to 5am to avoid impacts to ferry service. The area is not surrounded by residential areas, so impacts will be minimal.***

B. Archaeological, Historic, and Cultural Resources

1. The Shoreline Administrator shall ensure that known or suspected locations of archaeological resources are protected consistent with provisions and procedures in the GMA Comprehensive Plan and Memorandum of Understanding between the County and the State Department of Archaeology and Historic Preservation (DAHP).

***Consistent: USACE, Seattle District has reviewed the proposed action and conducted an analysis in accordance with Section 106 of the NHPA's implementing regulations at 36 C.F.R.§ 800. Review of the proposed dredging finds that the activity will have no effect to known archaeological or cultural resources within the area of potential effect. No further archaeological work is recommended.***

C. Environmental Protection and Critical Areas

1. All shoreline use and development, including preferred uses and uses that are exempt from shoreline substantial development permit requirements, shall be sited, designed, constructed, conducted, and maintained in a manner that maintains shoreline ecological processes and functions, and protects the natural character of the shoreline.

***Consistent: The proposed action is maintenance dredging of an existing channel. Although there will be temporary impacts to ecological resources from elevated turbidity and noise, and disturbance of the substrate, no long-term impacts to ecological processed and functions are anticipated. Benthic communities are expected to recover within a couple of months. Placement of materials along the beach will provide sediment to an area that would otherwise erode due to interruption of littoral drift caused by the jetty and dredging of the harbor.***

6. Projects shall be designed to protect hydrologic connections between water bodies, water courses, and associated wetlands.

***Consistent: Maintenance dredging and placing materials along the shoreline will have no impacts on hydrologic connections between water bodies, water courses, and associated wetlands.***

13. Fish and Wildlife Habitat Conservation Areas

a) Fish and Wildlife Habitat Conservation Areas (FWHCAs) are defined in ICC 17.05A.070 and include their associated buffers.

**The proposed action is located in a Fish and Wildlife Conservation Area since it is a marine area and critical habitat for Federally ESA listed species.**

i) Standards: Critical Saltwater Habitats. The following standards apply to all development adjacent to or containing Critical Saltwater Habitat:

(i) Development shall not intrude into, over, or within ten (10) feet from eelgrass meadows and kelp beds except when there is no feasible alternative alignment or location and the development would result in no net loss of the plant species and habitat.

***Consistent: The proposed dredging and placement of materials is not within 10 feet kelp or eelgrass.***

(vi) All developments and uses on navigable waters or their beds shall be located and designed to allow for the safe, unobstructed passage of fish, marine mammals, and birds, particularly species dependent on migration.

***Consistent: Disturbance to fish and wildlife will be temporary, including elevated turbidity and noise. USACE will conduct dredging operations during the prescribed work window of 16 July through 15 February to avoid impacts to sensitive species and will monitor water quality during the dredging and placement of materials to adhere to condition in the WQC from Ecology.***

(vii) Uses that adversely impact the ecological functions of critical saltwater shall be prohibited except uses necessary to achieve the objectives of RCW 90.58.020, and then only when all potential impacts are mitigated as necessary to ensure maintenance of shoreline ecological functions and processes;

***Consistent: Although there will temporary impacts to ecological function from elevated turbidity and noise, and disturbance of the substrate, no long-term impacts ecological processed and functions are anticipated. Benthic communities are expected to recover within a couple of months. Placement of materials along the beach will provide sediment to an area that would otherwise erode due to interruption of littoral drift caused by the jetty and dredging of the harbor. The sediment placement will provide shallow water habitat for a variety of marine species.***

N. Water Quality and Quantity

1. The location, design, construction, and management of all shoreline uses and activities shall protect the quality and quantity of surface and ground water adjacent to the site.

2. Best management practices (BMPs) for control of erosion and sedimentation shall be implemented for all shoreline development. All shoreline uses and activities shall use best management practices (BMPs) for control of erosion and sedimentation during both project construction and operation.

***Consistent: USACE will employ a variety of BMPs to protect water quality and prevent erosion and sedimentation, which include water quality monitoring, allowing material to decant on the upper portions of the beach before grading into the intertidal zone, and not allowing barges to fill beyond their capacity.***

**17.05A.110 Shoreline Modifications Regulations**

D. Dredging and Dredged Material Disposal

1. New development shall be sited and designed to avoid or, where avoidance is not possible, to minimize the need for new maintenance dredging.

2. Dredging and dredged material disposal shall be located, designed, and constructed to protect shoreline ecological functions and ecosystem-wide processes and avoid or minimize significant ecological impacts.

3. Any impacts shall be mitigated consistent with the mitigation sequence in ICC 17.05A.090.C.7.

***Consistent: The proposed action is the maintenance dredging of an established channel that allows for ferry service to Whidbey Island. No new dredging will occur. The placement of material will prevent erosion of the beach down-drift of the channel due to interruption of littoral drift caused by the jetty and ongoing maintenance dredging of the channel. No mitigation is necessary.***

4. Dredging and dredged material disposal below the Ordinary High Water Mark shall be permitted only:

    a) When necessary for the operation of a water-dependent use; or

    b) When necessary to mitigate conditions that endanger public safety or fisheries resources; or

    c) For establishing, maintaining, expanding, relocating or reconfiguring navigation channels and basins when necessary to ensure safe and efficient accommodation of existing navigation uses when:

        (i) Significant ecological impacts are minimized;

        (ii) Mitigation is provided, employing the mitigation sequence in ICC 17.05A.090.C.7; and

        (iii) Dredging is maintained to the existing authorized location, depth and width;

d) For restoration projects associated with implementation of the Model Toxics Control Act or the Comprehensive Environmental Response, Compensation, and Liability Act, or any enhancement or restoration project; or

e) For flood risk reduction projects conducted in accordance with ICC 14.02A.050.

***Consistent: The proposed maintenance dredging will maintain the authorized location, depth, and width of an existing channel that provides ferry access to Whidbey Island, consistent with option c. Ecological impacts will be temporary and will be minimized by the use of BMPs such as working within the approved in-water work window of 16 July to 15 February, water quality monitoring, allowing material to decant on the upper portions of the beach before grading into the intertidal zone, and not allowing barges to fill beyond their capacity. The placement of material will prevent erosion of the beach down-drift of the channel due to interruption of littoral drift caused by the jetty and ongoing maintenance dredging of the channel. No other mitigation is necessary.***

5. Dredging is not allowed waterward of the Ordinary High Water Mark for the primary purpose of obtaining fill material.

***Consistent: The purpose of the maintenance dredging is to provide necessary safe navigation conditions for the Washington State Ferry System vessels to dock at Keystone Harbor for uninterrupted service on the Port Townsend/Coupeville ferry route.***

6. Disposal of dredged material shall be done only in approved upland disposal sites and shall not be allowed within critical areas or their buffers, except as part of an approved ecological restoration or enhancement project.

Consistent: ***The placement of material will prevent erosion of the beach down-drift of the channel due to interruption of littoral drift caused by the jetty and ongoing maintenance dredging of the channel. The placement of materials has been coordinated with various natural resource agencies.***

7. Stockpiling of dredged material in or under water is prohibited.

***Consistent: No material will be stockpiled in or underwater.***

8. In order to ensure that operations involving dredged material disposal and maintenance dredging are consistent with the Shoreline Master Program as required by RCW 90.58.140(1), no dredging may commence in any shoreline designation without the responsible person having first obtained the appropriate local, state and federal permits.

***Consistent: As a Federal agency, USACE will obtain all Federal permits.***

16. Proposals that cause substrate displacement or that involve substrate modification through dredging, trenching, or digging shall not be allowed in existing kelp or eelgrass beds without an approved mitigation plan.

***Consistent: No dredging or placement of materials will occur in kelp or eelgrass beds.***

17. Dredging operations shall minimize interference with navigation and normal public use of the water.

***Consistent: Dredging will occur from 9pm to 5am to minimize impacts to ferry service, which will also reduce impacts to navigation and other public uses.***

**17.05A.120 Shorelines of Statewide Significance**

A. In addition to compliance with the Use Requirements which hereafter follow, developments proposed within Shorelines of Statewide Significance shall, insofar as is possible:

1. Recognize and protect the statewide interest over local interest;
2. Preserve the natural character of the shoreline;
3. Result in long term over short term benefit;
4. Protect the resources and ecology of the shorelines;
5. Increase public access to publicly owned areas of the shorelines;
6. Increase recreational opportunities for the public in the shoreline; and
7. Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

***Consistent: The proposed action is maintenance of an existing channel with placement of materials along the adjacent beach that is subject to extensive erosion due to the lack of sediment input caused by the jetty. The placement of materials preserves the natural character of the shoreline, and allows for continued public recreational opportunities at Ebey's Landing National Historical Reserve. Impacts to resources and ecology will be short-term and limited to construction, with no long-term adverse impacts.***

## 6 STATEMENT OF CONSISTENCY

Based on the above evaluation, USACE has determined that the proposed maintenance dredging and disposal activities are consistent with the applicable policies and regulations specified in the Island County SMP. The proposed action is thus considered to be consistent to the maximum extent practicable with the enforceable policies of the State of Washington Shoreline Management Program and policies and standards of the Island County SMP.

# Appendix E – Cultural Resource Letters

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

TO REPLY
ATTENTION OF:

Planning, Environmental, and Cultural Resources Branch

JAN 30 2020

Allyson Brooks, Ph.d.
State Historic Preservation Officer
Department of Archaeology and Historic Preservation
P.O. Box 48343
Olympia, WA 98504

SUBJECT: Keystone Harbor Maintenance Dredging and Disposal Fiscal Years 2020 through 2035, Whidbey Island, Island County, Washington.

Dear Dr. Brooks,

The Seattle District, U.S. Army Corps of Engineers (Corps) proposes to conduct maintenance dredging of the Federal navigation channel in Keystone Harbor, Whidbey Island, Island County, Washington. The Corps has determined the project constitutes an undertaking that has the potential to cause effects on historic properties and we are initiating consultation in accordance with 36 CFR §800, the regulations implementing Section 106 of the National Historic Preservation Act (NHPA). The Corps has determined and documented the area of potential effects (APE) for the undertaking and is consulting with your office as provided at 36 CFR § 800.4(a). The Corps is seeking agreement from your office on the boundaries of the APE and we are seeking information from your office on knowledge or concerns with historic properties within the APE that may be affected by this undertaking.

Proposed Undertaking [§ 800.3(a)]

The undertaking would be located on the west side of Whidbey Island in Island County, Washington (Township 31N, Range 1W, Section 22, Willamette Meridian). Keystone Harbor is the eastern terminal of the Port Townsend/Coupeville ferry route (Figure 1). The navigation channel connects Admiralty Inlet to the Washington State Ferry terminal.

The Corps is proposing to conduct routine and recurring maintenance dredging over a 15-year period with a maximum of five dredge events. The Corps would dredge up to 50,000 cubic yards (cy) of material per dredge event from stations 0+00 to 15+00 of the main channel to its authorized depth of 25 feet below Mean Lower Low Water (Figure 2). The method would be either mechanical dredging with material placed on a barge or hydraulic pipeline dredging. Dredged material would be placed on the beach disposal site located adjacent the navigation channel.

Proposed Area of Potential Effects [§ 800.4(a)(1)]

The APE would encompass the Federal navigation channel, portions of Admiralty Inlet in Puget Sound, and the adjacent shoreline to include a total area of approximately 115 acres (Figure 3). Anticipated ground disturbance from dredging would take place only within the established navigation channel and harbor, approximately 200 to 670 feet wide by 1,800 feet long for a total area of approximately 12 acres. The proposed beach disposal site is approximately 180 feet wide by 600 feet long for a total area of approximately 2.5 acres. The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed undertaking.

Identification of Historic Properties [§ 800.4(a)(2)]

A Corps Project Archeologist has completed a records and literature search using the Washington Information System for Architectural and Archaeological Records Data and other relevant sources to identify known and potential historic properties within the APE. A total of five cultural resources investigations have been conducted within the APE (Kent 2006; Kelley 2012; Blukis Onat 2006; Blukis Onat et al. 2006; Castronuevo and Garrison 2016). A total of nine archeological sites are located within 1 mile of the APE; however, none are recorded within the APE.

One historic property, the Central Whidbey Island National Historic District, listed on the National Register of Historic Places, is located within the APE. The Old Fort Casey Wharf (Property ID: 203) is also located within the APE; however, there is currently no determination on its eligibility to the National Register of Historic Places.

The APE is within the traditional territories of several Coast Salish communities (Duer 2009; Suttles and Lane 1990; Waterman et al. 2001). Historical and ethnographic accounts record several Lushootseed place names for locations around the west shore of Whidbey Island within and near the APE in the locations currently referred to as Admiralty Head and Lake Crockett (Waterman et al. 2001:355-356).

As part of our ongoing efforts to identify historic properties, we are seeking information from your office on knowledge or concerns with historic properties within the APE that may be affected by this undertaking. Concurrently, the Corps is consulting with the Jamestown S'Klallam Tribe, Lower Elwha Klallam Tribal Community, Lummi Indian Nation, Port Gamble S'Klallam Tribe, Skokomish Indian Tribe, Suquamish Indian Tribe of the Port Madison Reservation, Swinomish Indian Tribal Community, and the Tulalip Tribes of Washington on knowledge or concerns with historic properties with religious or cultural significance within the APE.

The Corps requests your agreement with our determination of the APE and any information you can provide about historic properties that may be affected by this undertaking. If you have any questions or desire additional information, please contact the Project Archeologist, Jeremy W. Ripin at jeremy.w.ripin@usace.army.mil or (206) 764-3630. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761.

Sincerely,

For

LAURA A. BOERNER, Chief
Planning, Environmental and Cultural Resources Branch, Seattle District, U.S. Army Corps of Engineers

Enclosures (4)

References

Blukis Onat, Astrida
2006 *Summary Report of Archaeological Monitoring of Geotechnical Borings, Keystone Harbor, Whidbey Island.* BOAS, Inc. Submitted to Washington State Ferries, Washington Department of Transportation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Blukis Onat, Astrida, Roger Kiers, Robert M. Weaver, Jessica Feldman, Megan Venno, and James C. Bard
2006 *Historic, Cultural, and Archaeological Resources Discipline Report.* BOAS, Inc., The Environmental History Company, and CH2MHill. Submitted to Washington State Ferries, Washington Department of Transportation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Castronuevo, Agnes and Patrick Garrison
2016 *WA1 Neptune Archaeological Survey Report.* Terracon Consultants, Inc. Submitted to Verizon Wireless. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Duer, Douglas
2009 *Ebey's Landing National Historical Reserve: An Ethnohistory of Traditionally Associated Contemporary Populations.* Pacific West Region Series in Social Science No. 2009-02. Fredrick F York, Managing Editor, United States Department of the Interior, National Park Service, Seattle.

Kelley, Lisa
2012 *Cultural Resource Survey of the Recreational Vehicle Utilities Installation Project Fort Casey State Park, Operations Project.* Washington State Parks. Submitted to Washington Department of Archaeology and Historic Preservation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Kent, Ronald J.
2006 *Cultural Resources Survey for the Lake Crocket Navigation Channel Maintenance Dredging and Adjacent Beach Nourishment Project, Whidbey Island, Island County, Washington.* US Army Corps of Engineers, Seattle District. Submitted to Washington State Historic Preservation Officer. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Suttles, Wayne and Barbara Lane
1990 Southern Coast Salish. In *Northwest Coast*, edited by Wayne Suttles, pp. 484-502. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Waterman, Thomas T., Vi Hilbert, Jay Miller, and Zalmai Zahir
2001 *Puget Sound Geography*. Lushootseed Press, Federal Way.

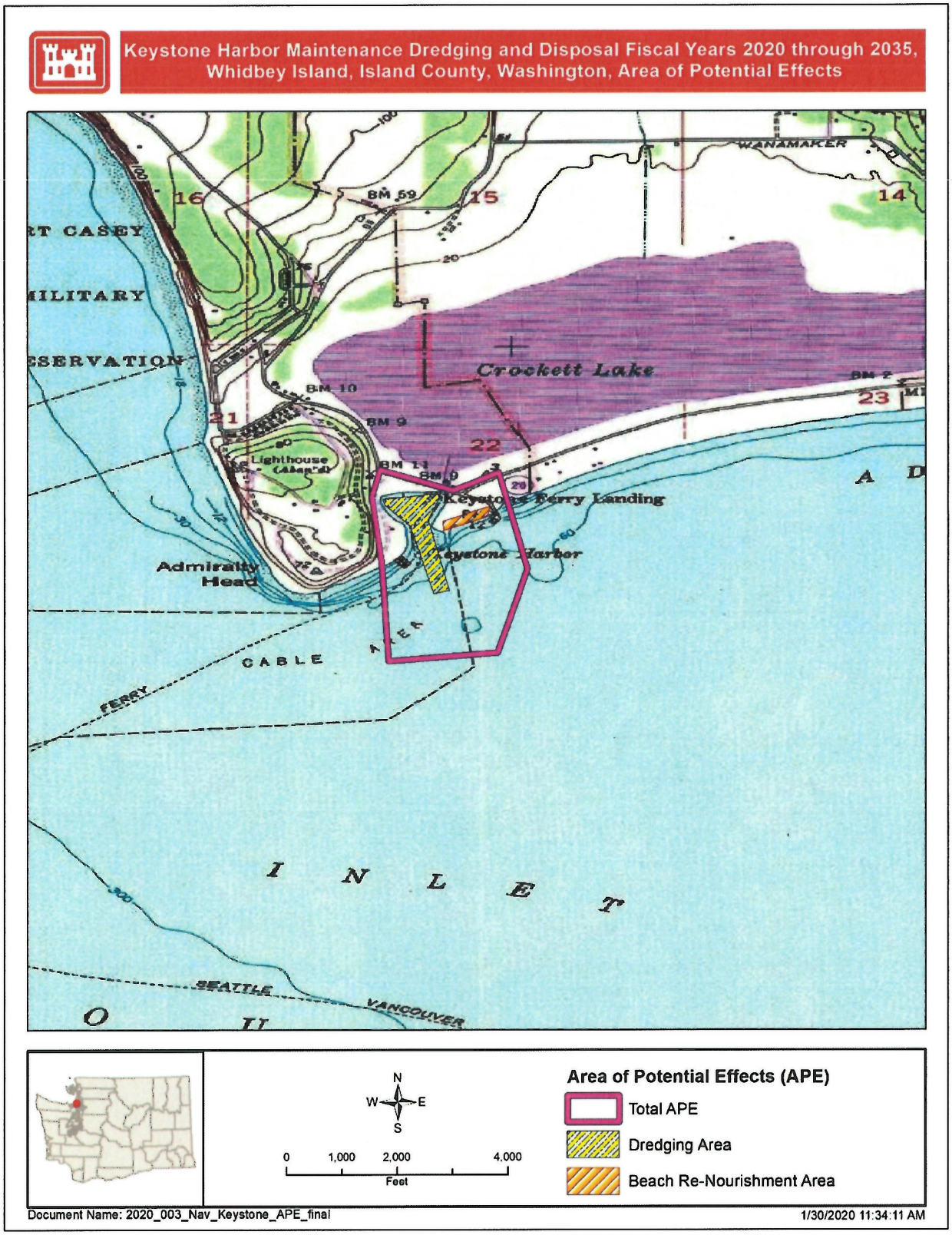


Figure 1. Undertaking location on Whidbey Island near the city of Coupeville, Washington.

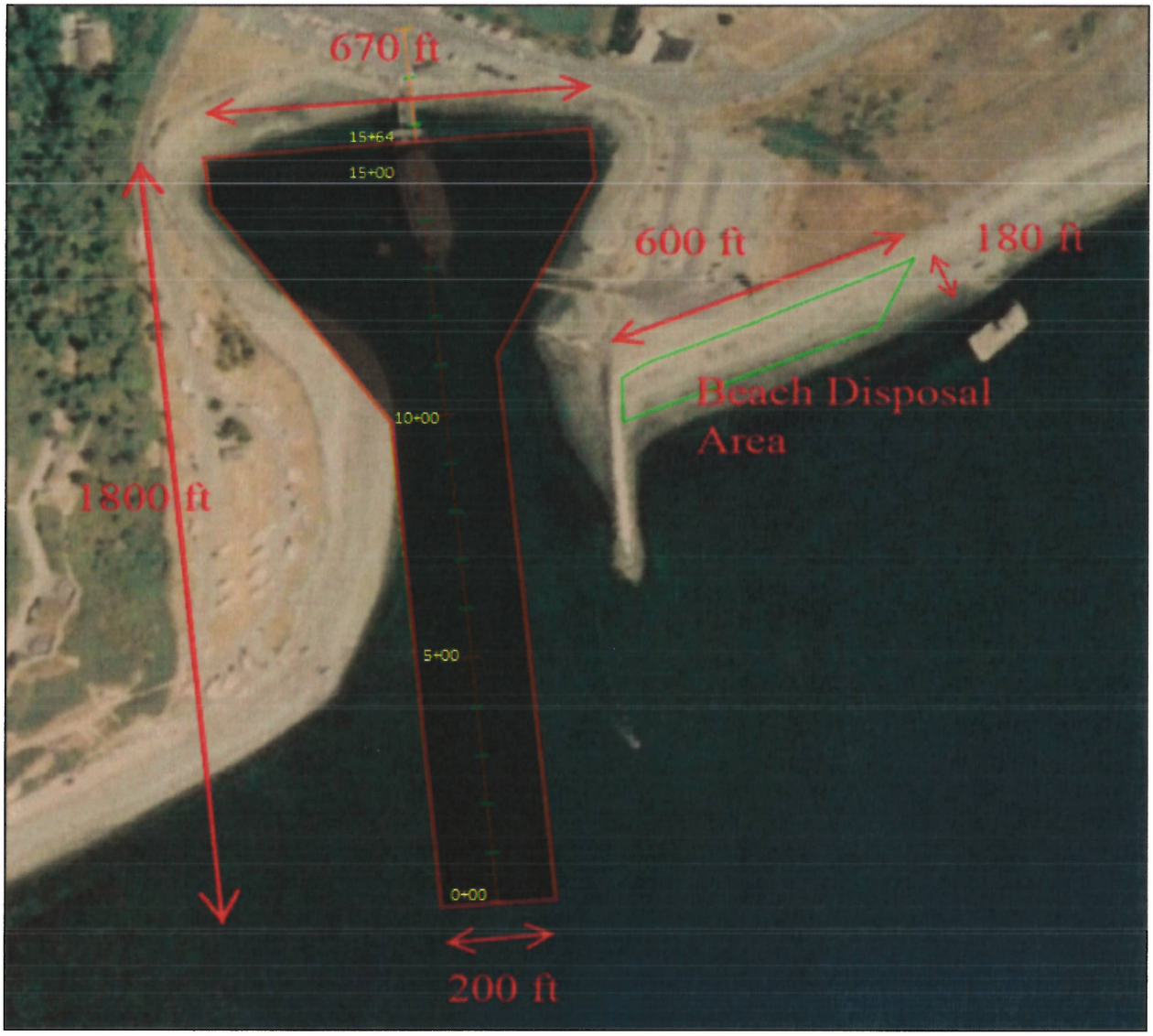


Figure 2. Overview map of Keystone Federal navigation channel and proposed maintenance dredging and beach disposal/ re-nourishment locations.

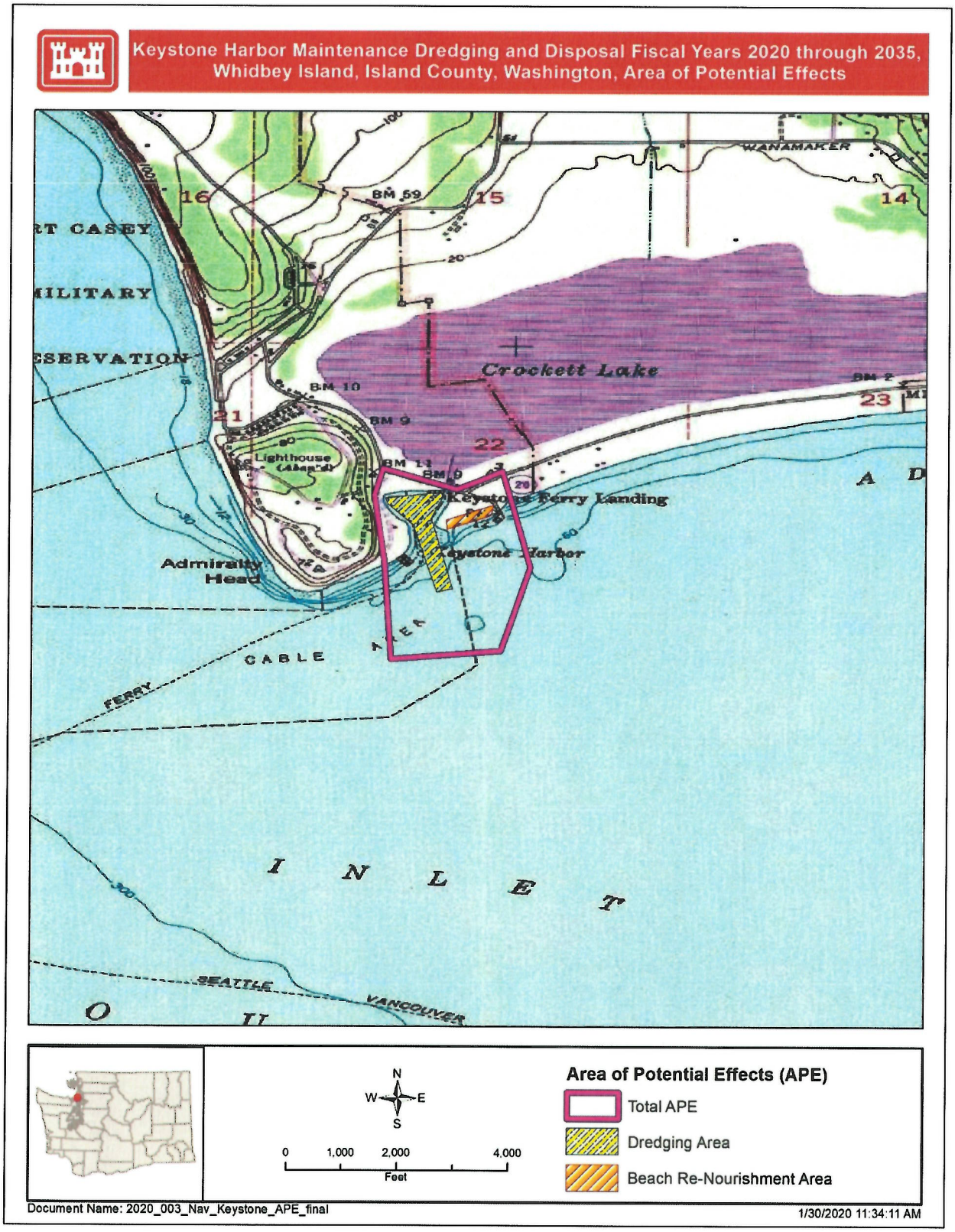


Figure 3. Map of proposed area of potential effects (APE) within Coupeville, WA USGS quadrangle.

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

February 3, 2020

Ms. Laura A. Boerner
Environmental Resources Section
Corps of Engineers – Seattle District
PO Box 3755
Seattle, Washington 98124-3755

Re: Keystone Harbor Maintenance Dredging and Disposal Project
Log No.: 2020-01-00707-COE-S

Dear Ms. Boerner:

Thank you for contacting our department. We have reviewed the materials you provided for the Area of Potential Effect (APE) for the proposed Keystone Harbor Maintenance Dredging and Disposal Project in Keystone Harbor, Whidbey Island, Island County, Washington

We concur with your determination of the Area of Potential Effect (APE) as described and presented in your figures and text.

We look forward to further consultations as you consult with the concerned tribal governments, provide the results of the professional cultural resources review, and render your determination of effect.

We would also appreciate receiving any correspondence or comments from concerned tribes or other parties that you receive as you consult under the requirements of 36CFR800.4(a)(4).

These comments are based on the information available at the time of this review and on behalf of the State Historic Preservation Officer in compliance with the Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations 36CFR800.4. Should additional information become available, our assessment may be revised. Thank you for the opportunity to comment.

Sincerely,

Robert G. Whitlam, Ph.D.
State Archaeologist
(360) 586-3080
email: *rob.whitlam@dahp.wa.gov*

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

TO REPLY
ATTENTION OF:

Planning, Environmental, and Cultural Resources Branch

JAN 3 0 2020

The Honorable Teri Gobin, Chair
Tulalip Tribes of Washington
6406 Marine Drive
Tulalip, Washington 98271-9775

SUBJECT: Keystone Harbor Maintenance Dredging and Disposal Fiscal Years 2020 through 2035, Whidbey Island, Island County, Washington.

Dear Madam Chair,

The Seattle District, U.S. Army Corps of Engineers (Corps) proposes to conduct maintenance dredging of the Federal navigation channel in Keystone Harbor, Whidbey Island, Island County, Washington. In accordance with 36 CFR §800, the implementing regulations for Section 106 of the National Historic Preservation Act (NHPA), the Corps is conducting a review to determine potential effects to historic properties. As specified by 36 CFR § 800.4(a)(4) we are notifying you about the proposed project and requesting your assistance in gathering information on knowledge or concerns with historic properties with religious or cultural significance that may be affected by this the project. This letter also summarizes efforts made by the Corps to identify historic properties that may be affected by this proposed undertaking.

Project Description and Scope of Work

The undertaking would be located on the west side of Whidbey Island in Island County, Washington (Township 31N, Range 1W, Section 22, Willamette Meridian). Keystone Harbor is the eastern terminal of the Port Townsend/Coupeville ferry route (Figure 1). The navigation channel connects Admiralty Inlet to the Washington State Ferry terminal.

The Corps is proposing to conduct routine and recurring maintenance dredging over a 15-year period with a maximum of five dredge events. The Corps would dredge up to 50,000 cubic yards (cy) of material per dredge event from stations 0+00 to 15+00 of the main channel to its authorized depth of 25 feet below Mean Lower Low Water (Figure 2). The method would be either mechanical dredging with material placed on a barge or hydraulic pipeline dredging. Dredged material would be placed on the beach disposal site located adjacent the navigation channel.

Area of Potential Effects (APE)

The APE would encompass the Federal navigation channel, portions of Admiralty Inlet in Puget Sound, and the adjacent shoreline to include a total area of approximately 115 acres (Figure 3). Anticipated ground disturbance from dredging would take place only within the established navigation channel and harbor, an area 200 to 670 feet wide, approximately 1,800 feet long for a total area of approximately 12 acres. The proposed beach disposal site is approximately 180 feet wide, approximately 600 feet long for a total area of approximately 2.5 acres. The Corps believes that the APE is sufficient to identify and consider both direct and indirect effects of the proposed project.

Identification of Historic Properties

A Corps Project Archeologist has completed a records and literature search using the Washington Information System for Architectural and Archaeological Records Data and other relevant sources to identify known and potential historic properties within the APE. A total of five cultural resources investigations have been conducted within the APE (Kent 2006; Kelley 2012; Blukis Onat 2006; Blukis Onat et al. 2006; Castronuevo and Garrison 2016). A total of nine archeological sites are located within 1 mile of the APE, none are recorded within the APE.

One historic property, the Central Whidbey Island National Historic District, listed on the National Register of Historic Places, is located within the APE. The Old Fort Casey Wharf (Property ID: 203) is also located within the APE; however, there is currently no determination on its eligibility to the National Register of Historic Places.

The APE is within the traditional territories of several Coast Salish communities (Duer 2009; Suttles and Lane 1990; Waterman et al. 2001). Historical and ethnographic accounts record several Lushootseed place names for locations around the west shore of Whidbey Island within and near the APE in the locations currently referred to as Admiralty Head and Lake Crockett (Waterman et al. 2001:355-356).

If you have information or concerns regarding properties of religious or cultural significance that you believe may be affected by this project, please contact us as soon as possible. A copy of this letter with enclosures will be furnished to Richard Young, Cultural Resources at Hibulb Cultural Center and Natural History Preserve, Tulalip Tribes, 6410 23rd Avenue NE, Tulalip, Washington, 98271.

If you have any questions or desire additional information, please contact the Project Archeologist, Jeremy Ripin, at jeremy.w.ripin@usace.army.mil or (206) 764-3630. You may also contact Ms. Lori Morris, Tribal Liaison at (206) 764-3625 or by email at frances.morris@usace.army.mil. I may be contacted at laura.a.boerner@usace.army.mil or (206) 764-6761. Thank you for your assistance with this undertaking.

Sincerely,

For

LAURA A. BOERNER, Chief
Planning, Environmental and Cultural Resources Branch, Seattle District, U.S. Army Corps of Engineers

Enclosures (4)

References

Blukis Onat, Astrida
2006 *Summary Report of Archaeological Monitoring of Geotechnical Borings, Keystone Harbor, Whidbey Island.* BOAS, Inc. Submitted to Washington State Ferries, Washington Department of Transportation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Blukis Onat, Astrida, Roger Kiers, Robert M. Weaver, Jessica Feldman, Megan Venno, and James C. Bard
2006 *Historic, Cultural, and Archaeological Resources Discipline Report.* BOAS, Inc., The Environmental History Company, and CH2MHill. Submitted to Washington State Ferries, Washington Department of Transportation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Castronuevo, Agnes and Patrick Garrison
2016 *WA1 Neptune Archaeological Survey Report.* Terracon Consultants, Inc. Submitted to Verizon Wireless. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Duer, Douglas
2009 *Ebey's Landing National Historical Reserve: An Ethnohistory of Traditionally Associated Contemporary Populations.* Pacific West Region Series in Social Science No. 2009-02. Fredrick F York, Managing Editor, United States Department of the Interior, National Park Service, Seattle.

Kelley, Lisa
2012 *Cultural Resource Survey of the Recreational Vehicle Utilities Installation Project Fort Casey State Park, Operations Project.* Washington State Parks. Submitted to Washington Department of Archaeology and Historic Preservation. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Kent, Ronald J.
2006 *Cultural Resources Survey for the Lake Crocket Navigation Channel Maintenance Dredging and Adjacent Beach Nourishment Project, Whidbey Island, Island County, Washington.* US Army Corps of Engineers, Seattle District. Submitted to Washington State Historic Preservation Officer. Copies available from Department of Archaeology and Historic Preservation, Olympia.

Suttles, Wayne and Barbara Lane
1990 Southern Coast Salish. In *Northwest Coast*, edited by Wayne Suttles, pp. 484-502. Handbook of North American Indians, Vol. 7, William C. Sturtevant, general editor, Smithsonian Institution, Washington, DC.

Waterman, Thomas T., Vi Hilbert, Jay Miller, and Zalmai Zahir
2001 *Puget Sound Geography.* Lushootseed Press, Federal Way.

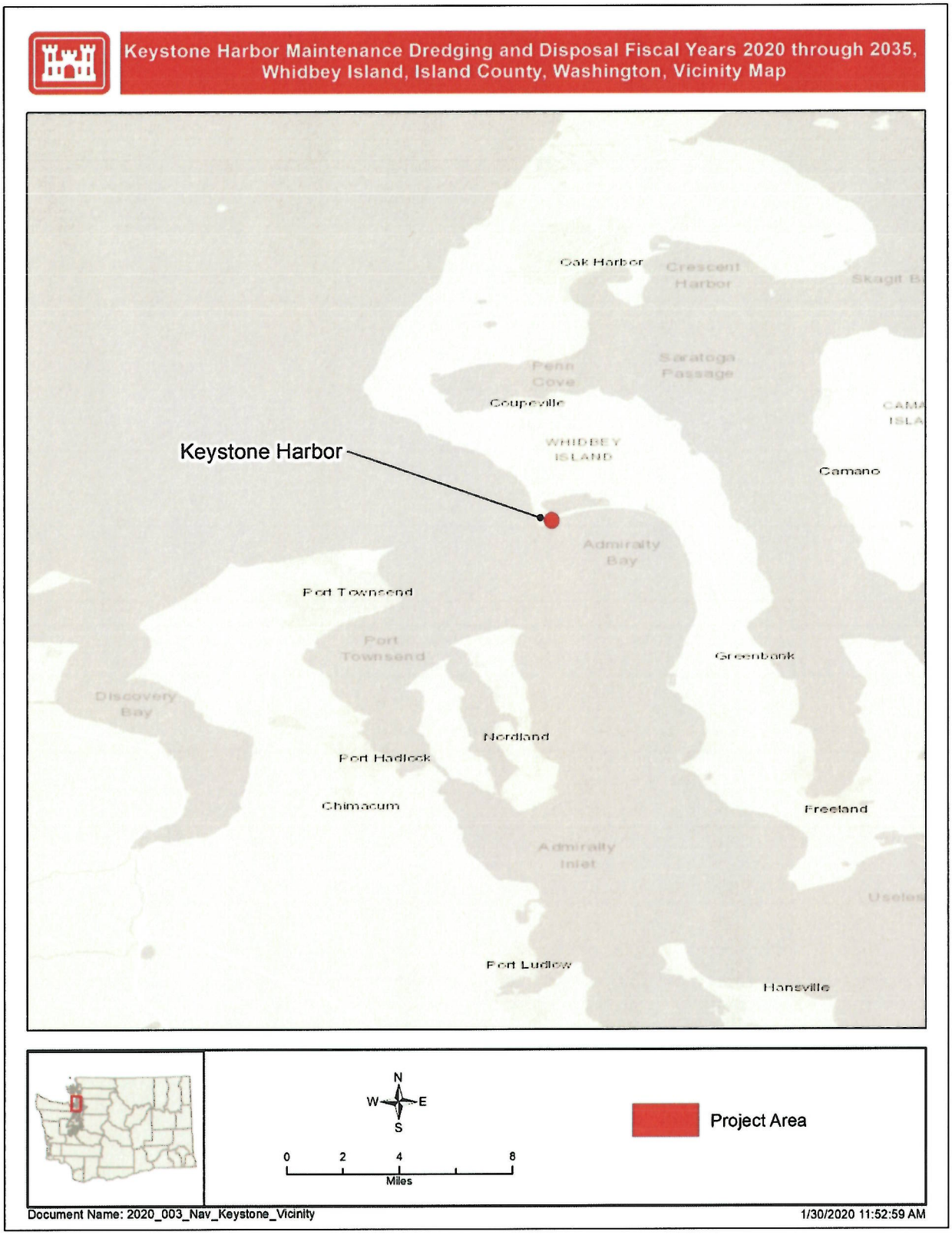


Figure 1. Undertaking location on Whidbey Island near the city of Coupeville, Washington.

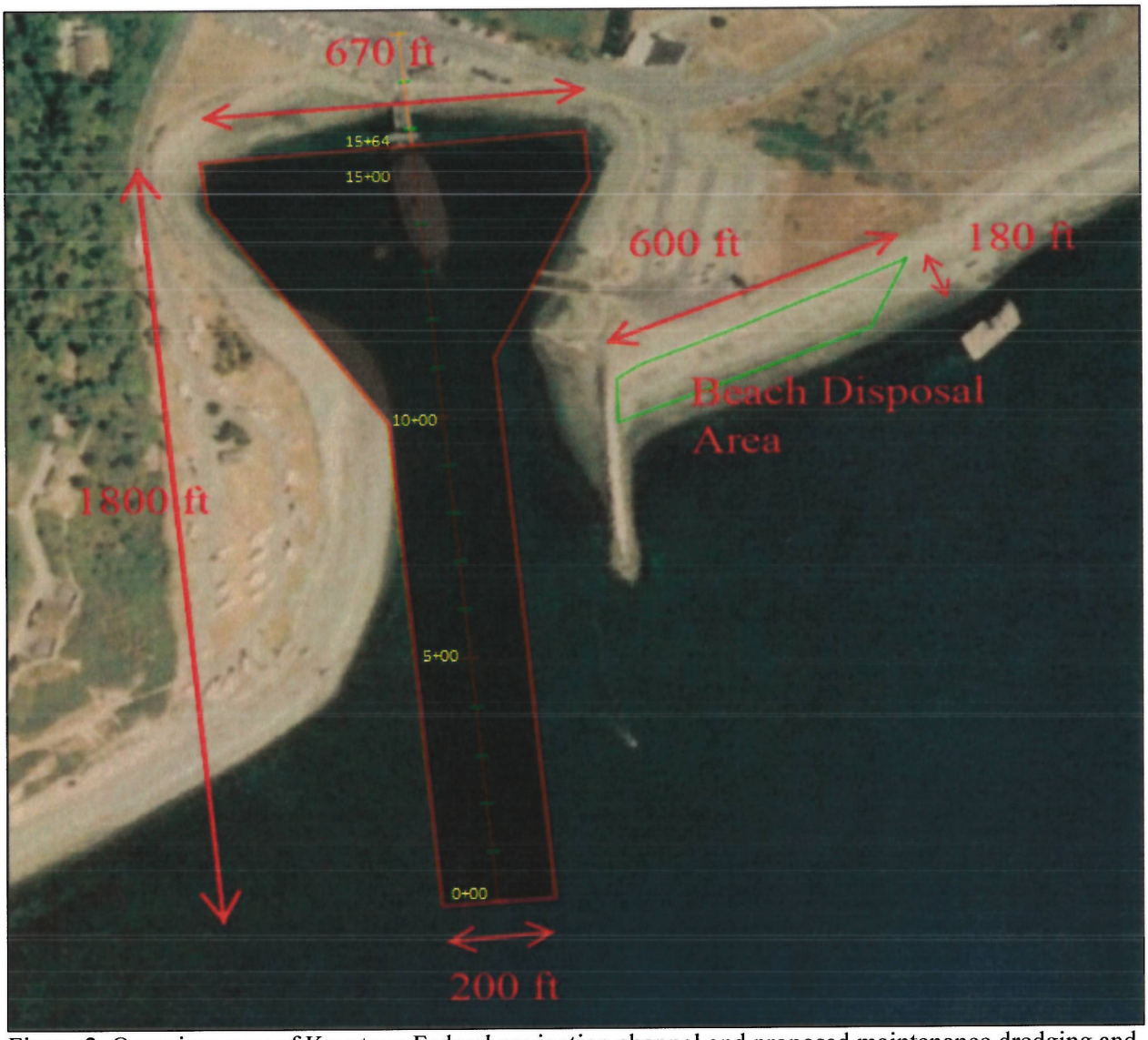

Figure 2. Overview map of Keystone Federal navigation channel and proposed maintenance dredging and beach disposal/ re-nourishment locations.

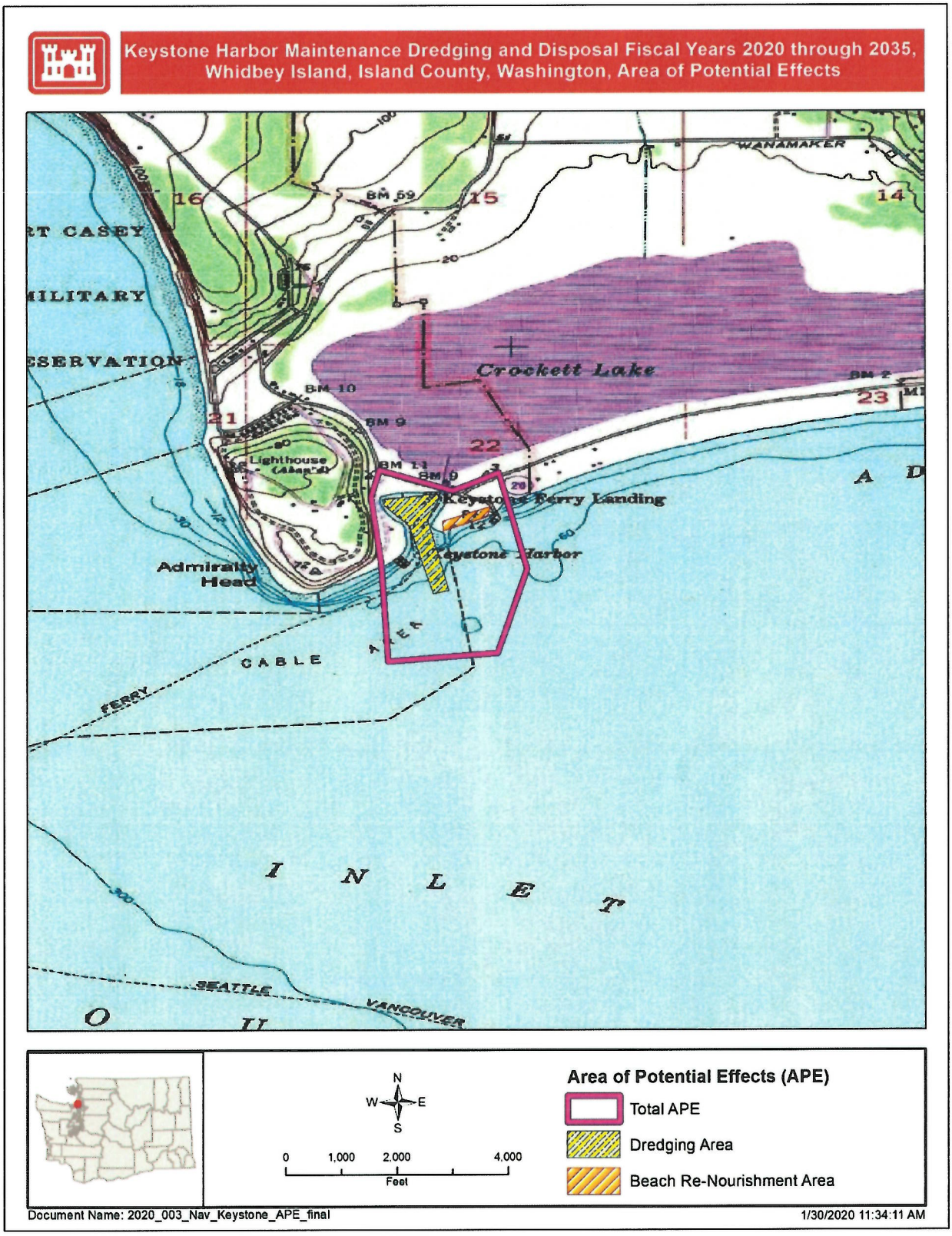


Figure 3. Map of proposed area of potential effects (APE) within Coupeville, WA USGS quadrangle.

# Appendix F – Example Tribal Fisheries Coordination Letter

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, SEATTLE DISTRICT
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

Planning, Environmental, and Cultural Resources Branch

The Honorable Teri Gobin
Chair, Tulalip Tribes
6406 Marine Drive
Tulalip, WA 98271

NOV 1 2 2019

Subject: Tribal Notification and Review for the Keystone Marina Dredging Project on Whidbey Island.

Dear Madam Chair:

The Seattle District, U.S. Army Corps of Engineers (Corps) is proposing to conduct maintenance dredging of Keystone Harbor in fiscal years (FY) 2020 through 2035[1] to authorized depths within the federally authorized footprint. Keystone Harbor is located in northern Puget Sound on the west side of Whidbey Island in Island County, Washington (Figure 1). The proposed work would dredge up to 50,000 cubic yards (cy) of material per dredge event and place it along a section of beach to the east of the breakwater (Figure 2), with a maximum of 165,000 cy over the 15-year period. The navigation project, including maintenance dredging and the breakwater, has interrupted sediment transport processes, and severe erosion can occur on the adjacent beach to the east and can undermine the Washington State Park's restroom facilities, picnic areas, parking lot, and recreational boat launch. The placement of materials will prevent erosion to the point of undermining the jetty and losing park infrastructure. The dredging and placement is expected to take approximately 60 days. The in-water work window begins on 16 July and ends on 15 February. The dredging method will be a clamshell dredge with material placed on a barge. Once full, the barge will move to the shoreline on the east side of the harbor. The barge will transload the material onto the shoreline using a front loader. A bulldozer may be used to grade the material (if it cannot be accomplished by a front loader).

In accordance with the National Environmental Policy Act, the Corps is preparing a Draft Environmental Assessment (EA) to evaluate the environmental effects of the proposed maintenance dredging of Keystone Harbor. The draft EA will be open for a 30 day public comment period. The Tulalip Tribes will be notified when the EA is available.

[1] FY (fiscal years) span from 1 October to 30 September. This document covers dredging events from 16 July 2020 to 15 February 2035 (these dates are associated with the in-water work window).

Should you wish to discuss the project in advance of the EA public comment period or any other concerns you may have, please contact the staff identified below and we will facilitate a meeting at the earliest convenience for both parties.

A courtesy copy of this letter with enclosures will be furnished to Ray Fryberg, Natural Resources Executive Director.

For assistance with general information regarding Tribal coordination, please contact Ms. Lori Morris, Tribal Liaison, at 206-764-3625 or frances.morris@usace.army.mil. To reply with comments or to request any additional information about this project, please contact Ms. Chemine Jackels at 206-764-3646 or chemine.r.jackels@usace.army.mil.

Sincerely,

Laura Boerner
Chief, Planning, Environmental and Cultural Resources Branch

Encls

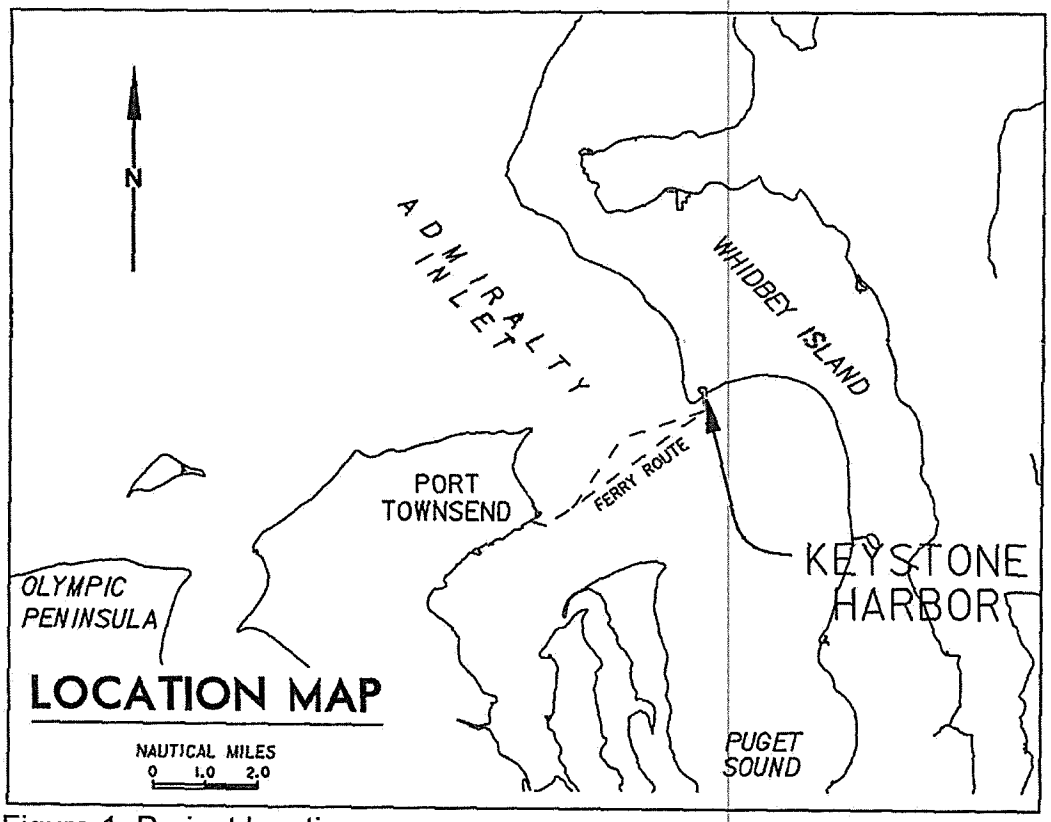

Figure 1. Project location.

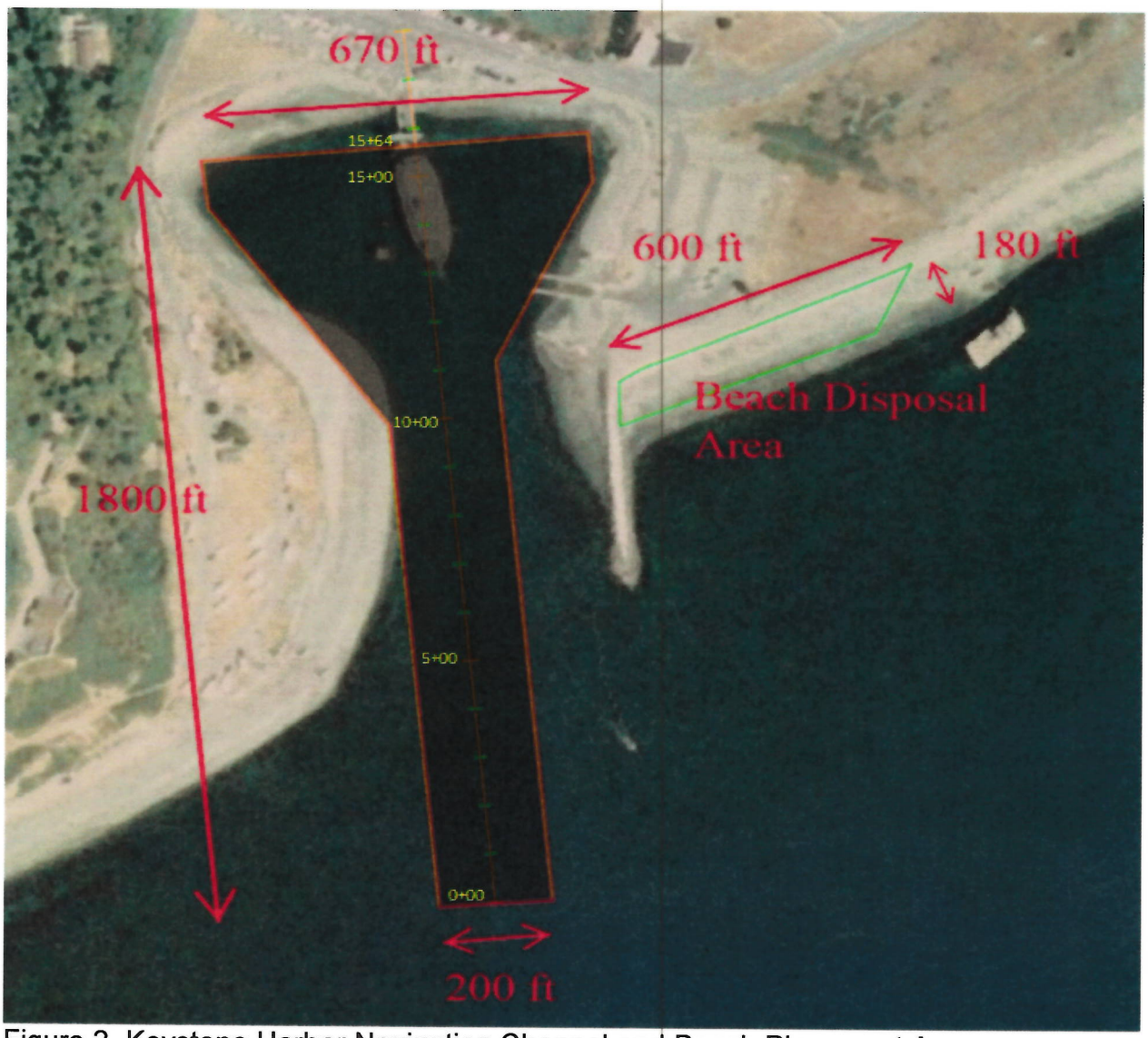

Figure 2. Keystone Harbor Navigation Channel and Beach Placement Area