Civil Works Branch

Public Notice

Alaska District
U.S. Army Corps of Engineers

Date 16 March 2012 Identification No. ER-12-05
Please refer to the identification number when replying.

U.S. Army Corps of Engineers (Corps) has prepared an environmental assessment (EA) and finding of no significant impact (FONSI) titled:

Maintenance Dredging
Petersburg North Harbor
Petersburg, Alaska

The U.S. Army Corps of Engineers (Corps) proposes to dredge the North Boat Harbor at Petersburg, Alaska. The harbor can be divided into five areas with varying design depth requirements: Area 1 to -11 feet MLLW, Area 2 to -14 feet MLLW, Area 3 to -24 feet MLLW, Area 4 to -24 feet MLLW, and Area 5 to -15 feet MLLW. Approximately 26,400 cubic yards of sediments are expected to be dredged using a clamshell dredge after 1 foot of overdepth is dredged to achieve design depth. A transport barge would carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material will be offloaded into watertight trucks for transport to the Petersburg Landfill. The city is also coordinating development of a disposal plan with the Alaska Department of Environmental Conservation that would use the dredged material as a cap for an existing pile of metal at the landfill.

The proposed project, alternatives, and potential environmental impacts are described in the enclosed EA. The EA is available for public review and comment until April 16, 2012. It may be viewed on the Alaska District's website at: www. poa.usace.army.mil. Click on Civil Works and Planning and look under Documents Available for Public Review, Reports and Environmental Documents.

To get a printed copy, email: Michael.9.Salyer@usace.army.mil or send a request to the address below:

U.S. Army Corps of Engineers, Alaska District
ATTN: CEPOA-EN-CW-ER (Salyer)
P.O. Box 6898
Joint Base Elmendorf-Richardson, Alaska 99506-0898

Comments on the EA and proposed project may be sent to the email or postal address.

Michael R. Salyer
Chief, Environmental Resources Section

US Army Corps of Engineers
Alaska District

Environmental Assessment and Finding of No Significant Impact

Maintenance Dredging
Petersburg North Harbor
Petersburg, Alaska

March 2012

FINDING OF NO SIGNIFICANT IMPACT

Maintenance Dredging
Petersburg North Boat Harbor
Petersburg, Alaska

The U.S. Army Corps of Engineers (Corps) will dredge the North Boat Harbor at Petersburg, Alaska. The harbor can be divided into five areas with varying design depth requirements: Area 1 to -11 feet MLLW, Area 2 to -14 feet MLLW, Area 3 to -24 feet MLLW, Area 4 to -24 feet MLLW, and Area 5 to -15 feet MLLW. Approximately 26,400 cubic yards of sediments are expected to be dredged using a clamshell dredge after 1 foot of overdepth is dredged to achieve design depth. A transport barge will carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material will be offloaded into watertight trucks for transport to the Petersburg Landfill. The Federal action concludes with initial disposal of the dredged material at the Petersburg Landfill. The City of Petersburg is accepting ownership of and responsibility for the dredged material after initial placement in the landfill. The city is also coordinating development of a disposal plan with the Alaska Department of Environmental Conservation that would use the dredged material as a cap for an existing pile of metal at the landfill.

Incorporating the following mitigation measures into the recommended plan will help to minimize adverse impacts that could occur on local fish and wildlife resources, including ESA-listed species, marine mammals, and EFH.

- The Federal action shall cease in-water construction between March 15 and June 15 during peak herring spawn activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide periods, unless there is a human safety issue requiring it.

- A construction oil spill prevention plan shall be prepared.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

- The Corps will conduct post-dredging bathymetry surveys to ensure that only the material identified to be dredged was removed to the authorized depth.
- A scow barge will be loaded so that enough freeboard remains to allow for safe movement of the barge and its material to the offloading site to be identified.

The Corps believes maintenance dredging Petersburg Harbor is consistent with State and local management programs to the maximum extent practicable.

This Finding of No Significant Impact's associated environmental assessment supports the Corps' conclusion that the maintenance dredging project in Petersburg Harbor, Alaska does not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, the preparation of an environmental impact statement is not necessary.

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Reinhard W. Koenig **Date**
Colonel, Corps of Engineers
Commanding

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ABBREVIATIONS AND ACRONYMS

ADEC – Department of Environmental Conservation, State of Alaska
ADFG – Alaska Department of Fish and Game
AHRS – Alaska Heritage Resources Survey
APE – Area of Potential Effect
BMP – Best management practice(s)
CO – Carbon Monoxide
Corps – U.S. Army Corps of Engineers
CWA – Clean Water Act
cy – cubic yard(s)
EA – Environmental Assessment
EFH – Essential Fish Habitat
EPA – U.S. Environmental Protection Agency
ESA – Endangered Species Act
FONSI – Finding of No Significant Impact
FR – Federal Register
MHHW – Mean Higher High Water
MLLW – Mean Lower Low Water
MSFCMA – Magnuson-Stevens Fisheries Conservation and Management Act
NMFS – National Marine Fisheries Service
NOAA – National Ocean and Atmospheric Administration
NO_x – Nitric Oxide and Nitrogen Oxide
PAH – Polycyclic aromatic hydrocarbon(s)
PM – Particulate Matter
PSDDA – Puget Sound Dredged Disposal Analysis
SHPO – State Historic Preservation Office
USFS – U.S. Forest Service
USFWS – U.S. Fish and Wildlife Service
USACE – U.S Army Corps of Engineers
VOC – Volatile Organic Carbon

Environmental Assessment
Maintenance Dredging
Petersburg North Boat Harbor
Petersburg, Alaska

1.0 Introduction

1.1 Purpose and Need

The U.S. Army Corps of Engineers (Corps) is proposing to dredge shoaled areas of the North Boat Harbor at Petersburg, Alaska. The purpose of the proposed dredging project is to restore design depths to allow for safe passage of vessels using the harbor. The harbor is shoaling in five areas with varying design depth requirements. A total of approximately 26,400 cubic yards of sediments are expected to be dredged with a clamshell dredge. A transport barge (scow barge) would carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material would be offloaded into watertight trucks for transport to the Petersburg Landfill. The Federal action concludes with initial disposal of the dredged material at the Petersburg Landfill. The City of Petersburg is accepting ownership and responsibility for the dredged material after initial placement in the landfill. The city is presently coordinating development of a disposal plan with the Alaska Department of Environmental Conservation to use the dredged material as a cap for an existing pile of metal at the landfill.

1.2. Project Authority

The Rivers and Harbors Act, 30 August 1935 (House Doc. 483, 72nd Congress, 2nd Session), the Rivers and Harbors Act, 2 March 1945 (House Doc. 670, 76th Congress, 3rd Session) as adopted, and the Rivers and Harbors Act, 2 September 1954 (House Doc. 501, 83rd Congress, 2nd Session) as adopted, gave the Corps the authority for operations and maintenance dredging of the approaches to the North Harbor boat basin and the basin itself at Petersburg, Alaska. Maintenance dredging was last conducted between 1969 and 1971.

1.3. Project Area Description

Petersburg, Alaska and its North Harbor are located on the northwesterly tip of Mitkof Island at the intersection of Fredrick Sound and Wrangell Narrows. The nearest comparable ports are Ketchikan, Alaska, 116 miles to the southeast, and Juneau, Alaska, 107 miles to the northwest (figure 1).

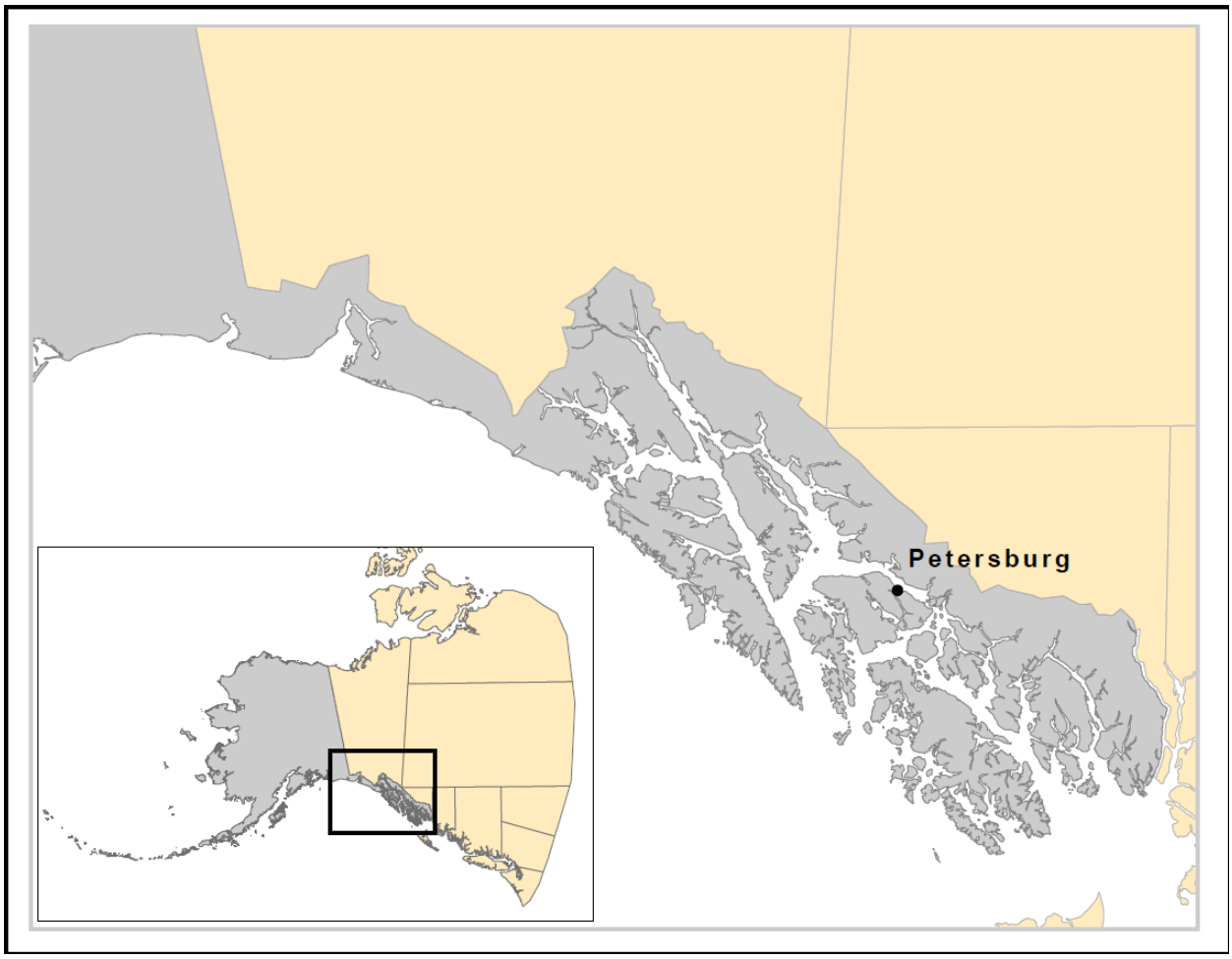

Figure 1. Petersburg location and vicinity map.

Construction of the original Petersburg Harbor facilities was first completed in 1937 (USACE 2009). The River and Harbor Act of March 2nd 1945 authorized enlargement of the harbor by dredging to -11 feet MLLW over approximately 135,000 square feet adjacent to and shoreward of the original authorized project limits (USACE 1977). In 1957 a shoreward excavation enlarged the basin and the outer one-third of the basin via dredging to -15 feet MLLW. Maintenance dredging has been required only once, in 1969, in the southern end of the basin. That action was concluded in 1971 with the removal of 2,000 cubic yards (cy) of silt (USACE 1977 & USACE 2009). To date, no additional Federal operations and maintenance dredging has occurred. Condition surveys of the harbor were conducted in 2000, 2003, and 2008. Vertical and oblique aerial photography was taken in 2005. Currently, shoaling is apparent around the vessel berths in the -15 to -11-foot MLLW areas. Shoaling is also apparent along the entire southern portion of the project limits, with depths as shallow as -7.4 feet MLLW in the vessel berths (USACE 2009).

During construction of the original harbor, approaches to the wharves were dredged to -24 feet MLLW, an approximately 5-acre small boat basin was dredged to a depth of -11 feet MLLW,

and a short channel 40 feet wide was dredged to -8 feet MLLW. The harbor is defined as an approximately mile-long expanse of water fronting Petersburg. The harbor is formed by a natural widening of the north end of the Wrangell narrows and is characterized by a relatively flat tidal beach that slopes gradually from the high water line to mid channel. Accordingly, depths in the harbor area vary from zero to channel depths of 4 to 5 fathoms. Primary harbor facilities include a boat ramp, tidal grid, finger and float system, and adjacent private wharves that service Icicle, Ocean Beauty, and Trident Seafoods canneries, and the Petersburg Harbormasters Office.

The primary source of sediments is Hammer Slough, which used to have its main channel through North Harbor. Middle Harbor, which abuts North Harbor to the southwest at the mouth of Hammer Slough, acts as a sediment trap to catch sediments traveling down Hammer Slough toward different areas of the harbor (USACE 1977).

The following are the areas proposed to be dredged under this action:

- Harbor Dredging Area 1: encompasses 5.83 acres and approximately 12,550 cy of material to achieve design depth.
- Harbor Dredging Area 2: encompasses 3.90 acres and approximately 3,350 cy of material to achieve design depth.
- Harbor Dredging Area 3: encompasses 0.82 acre and approximately 1,900 cy of material to achieve design depth.
- Harbor Dredging Area 4: encompasses 1.49 acres and approximately 7,200 cy of material to achieve design depth.
- Harbor Dredging Area 5: encompasses 0.20 acre and approximately 1,400 cy of material to achieve design depth.

The total surface acreage to be dredged is estimated at a little over 12 surface acres, and an estimated 26,400 cy would be dredged to achieve the design depth. A clamshell bucket dredge positioned on a vertically mobile platform would be used. The NEPA and related environmental analyses address the effects of a dredging effort consisting of approximately 26,400 cy of dredged material.

2.0 Alternatives

2.1. No Action Alternative

Under the No-Action alternative, no maintenance dredging in the harbor at Petersburg would occur. As a result, the harbor would continue to grow more restrictive, and use of the harbor would become more difficult and unsafe. Not providing channel and harbor maintenance at Petersburg Boat Harbor would continue to impact the navigation industry. The lack of maintenance dredging at Petersburg Harbor would present an increasing hazard to navigation and would impact access to existing terminals, berths, and mooring facilities. Shoaling within the harbor would eventually cause an adverse effect on the local economy.

2.2. Proposed Action

The Corps proposes to dredge the boat harbor at Petersburg, Alaska. The harbor can be divided into five areas with varying design depth requirements: Area 1 to -11 feet MLLW, Area 2 to -14 feet MLLW, Area 3 to -24 feet MLLW, Area 4 to -24 feet MLLW, and Area 5 to -15 feet MLLW (figures 2 and 3). Approximately 26,400 cubic yards of sediments are expected to be dredged using a clamshell dredge after 1 foot of overdepth is dredged to achieve design depth. A transport barge would carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material would be offloaded into watertight trucks for transport to the Petersburg Landfill. The Federal action concludes with initial disposal of the dredged material at the Petersburg Landfill. The City of Petersburg is accepting ownership of and responsibility for the dredged material after initial placement in the landfill. The city is coordinating development of a disposal plan with the Alaska Department of Environmental Conservation that would use the dredged material as a cap for an existing pile of metal at the landfill.

The Corps' hydrosurveys conducted in 2011 showed approximately 25,850 cy of material deposited at various locations in and around the harbor.

Table 1. Dredge quantities based on 2011 survey

Area	Estimated Quantity	Notes
Area 1 -15 Project Dept -16 Max pay	12,550 cy	Harbor Basin
Area 2 -11 Project Depth -12 Max Pay	3,350 cy	Harbor Basin
Area 3 -24 Project Depth -25 Max Pay	1,900 cy	South Dock (Ocean Beauty)
Area 4 -24 Project Depth -25 Max Pay	7,200 cy	North Dock – to dock face (Icicle Sea foods)
Area 5 (New) -15 Project Depth -16 Max Pay	1,400 cy	North Dock – Between Docks (Icicle Sea foods)
Total	26,400 cy	

It should be noted that it is not practical or possible to determine the exact amount of material to be removed. Shoals accrete and erode as harbor conditions change. Dredged material estimates are made based on pre-dredging hydrographic survey data. Dredging contract payments for material removed are based on post-dredging hydrographic surveys.

The Corps of Engineers Regulations Manual on Navigation and Dredging Operations and Maintenance ER 1130-2-520 states that:

> "It is the policy of the Corps of Engineers that dredging shall be accomplished in an efficient, cost-effective, and environmentally acceptable manner to improve and maintain the Nation's waterways and make them suitable for navigation and other purposes consistent with Federal laws and regulations."

And that:

> "The maximum practical benefits will be obtained from materials dredged from authorized Federal navigation projects, after taking into consideration economics, engineering, and environmental requirements in accordance with applicable Federal laws and regulations (33 CFR Parts 335-338)."

Based on these regulations and the available dredging and material placement options that meet the constraints of the type of material found in the harbor, the Corps proposes to dredge with a clamshell dredge and to place the material upland at the previously indentified landfill at Petersburg. Material would be removed by mechanical dredging of North Harbor using a barge mounted crane with a clamshell bucket. The dredged material would be deposited into a scow, transported to an existing ramp or off-loading facility, off-loaded into water-tight trucks, and transported to and disposed of in the Petersburg Landfill. Boulders would be disposed of above MHHW at Scow Bay. Dredging would comply with all terms of the Water Quality Certificate and would take place between 15 March and 15 June in accordance with the in-water work windows for this operation. Any exceptions to these agreements would require the concurrence of the appropriate regulating agency. This dredging method and placement option takes into consideration the required economic, engineering, and environmental requirements. Because this alternative minimized negative water quality impacts (in relation to hydraulic dredging) and resulted in the materials being disposed of in the least environmentally negative location known, it was carried forward for detailed analysis.

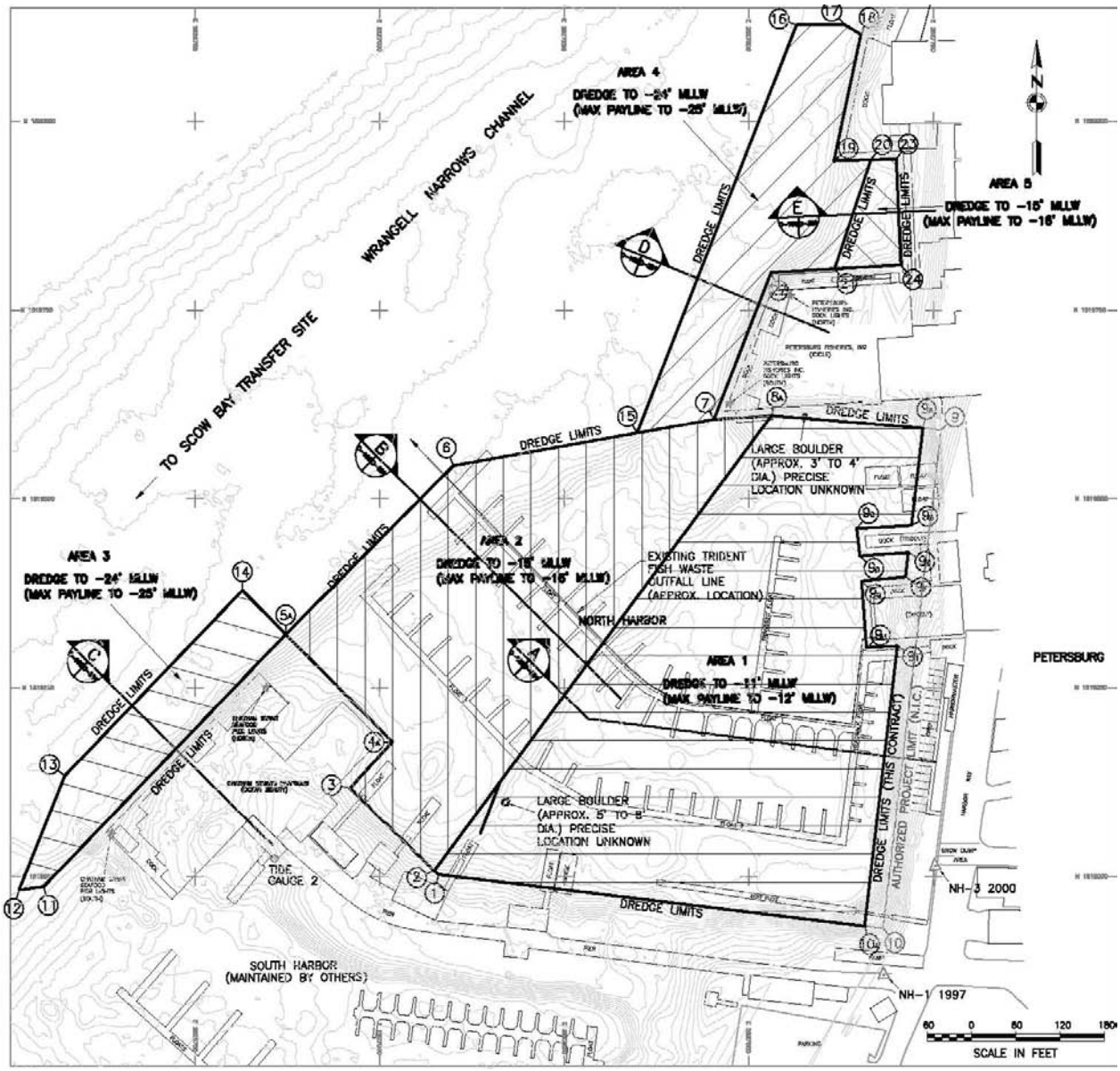

Figure 2. Petersburg Harbor areas requiring maintenance dredging

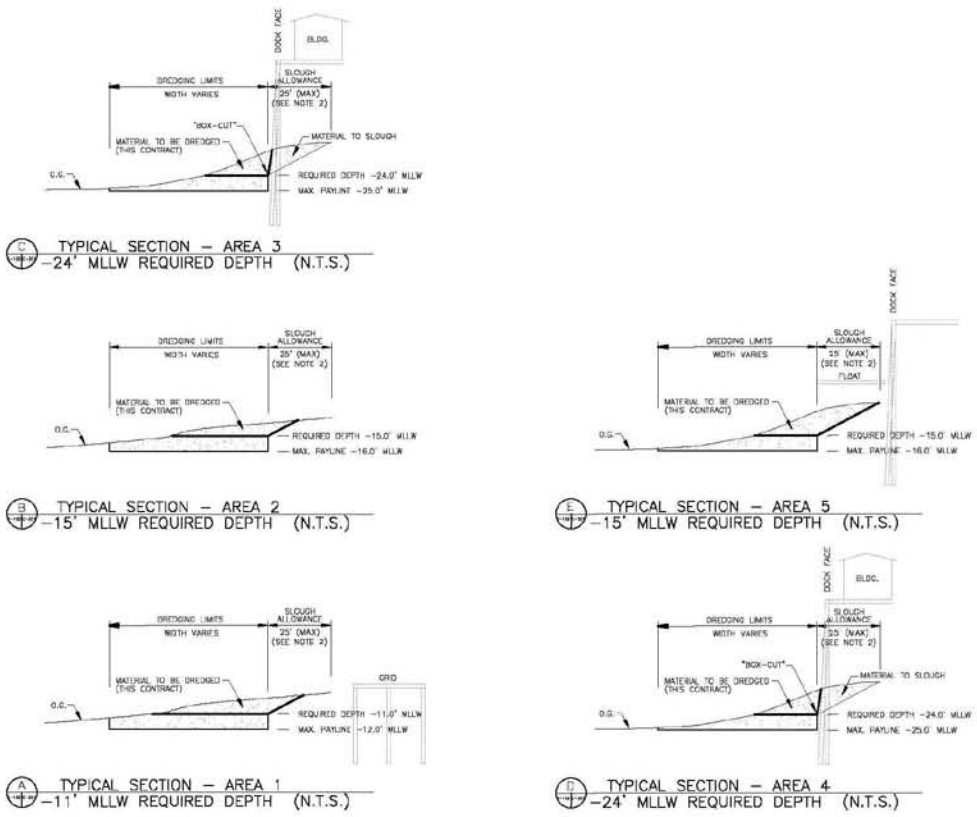

Figure 3. Cross sections for five areas being dredged in Petersburg Small Boat Harbor.

2.2.1 Dredging Options

The Corps considered several alternative methods, which are described in this section, for conducting the dredging. The Corps proposes to use a clamshell bucket for this operation because it will minimize return of sediment to the water in this environment, thus offering the lowest potential of any method for turbidity. This method also offers the lowest potential for re-deposition of any contaminants.

Hopper Dredge. A hopper dredge operates by use of suction "drag heads" that extend from the hull of the dredge down into the substrate to be dredged. Through suction, materials are brought up into the open hull of the dredge until the hopper is full and the material can then be moved to a dredged material placement site. Use of a hopper dredge works best in sandy environments. The suction of material also brings in huge volumes of water. The excess water (return water) is allowed to overflow the hopper and flow back into the waterbody. The overflow water can increase turbidity and may not meet water quality standards. Because the problem with return water from a hopper dredge in the silty sediment environment within the harbor, this alternative was not considered further.

Pipeline Dredge. A pipeline dredge, like the hopper dredge, uses suction and a cutter head to bring sediment up from the bottom of the harbor. However, a pipeline dredge does not have a hopper to contain the material. Instead, the material is moved directly to the placement site. As with a hopper dredge, excess water is removed with the sediment. The excess water helps to keep the sediment "fluid" so that it can be pumped to the dredged material disposal facility. The pipeline dredge must have a placement location within pumping range of the dredge. Because there is no dredged material placement site within pumping range of the harbor dredging location, this alternative was not considered further.

Clamshell Dredge. Clamshell dredging for the proposed project requires the use of a barge-mounted crane with a clamshell bucket that would be used to remove sediment from the harbor bottom. The Open Bucket Clamshell dredge is often used in marine environments due to an increased rate of efficiency for moving sediment. The captured sediment is primarily what is lifted to the surface and there is little entrained water that is moved to the dredged material placement site. Furthermore, in comparison to the other dredging methods, less turbidity can be expected, thus minimizing the spread of any contaminants to adjacent areas or to the water column. Using a clamshell dredge is also useful for removing boulders and harbor debris that exist in Petersburg North Harbor.

2.2.2 Dredged Material Placement Options

To assist the City of Petersburg with determining incremental costs, the Corps considered several options for placement of the dredged material. The options considered were: confined and uncapped in-water disposal, confined and capped in-water disposal, unconfined in-water disposal, and various combinations of partial in-water and landfill disposal with different dredge types. These options

were deemed not practicable and were not carried forward for further analysis. The City of Petersburg has provided the landfill as a placement location for the dredged material.

2.3. Conservation Measures

Incorporating the following mitigation measures into the recommended plan would help to ensure that no adverse impacts would occur on local fish and wildlife resources, including Endangered Species Act (ESA)-listed species, marine mammals, and Essential Fish Habitat (EFH).

- The proposed action shall cease in-water construction between March 15 and June 15 during peak herring spawning activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide periods, unless there is a human safety issue requiring it.

- A construction oil spill prevention plan shall be prepared.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

- The Corps will conduct post-dredging bathymetry surveys to ensure that only the material identified to be dredged was removed to the authorized depth.

- A scow barge will be loaded so that enough of the freeboard remains to allow for safe movement of the barge and its material on the route to the offloading site to be identified.

3.0 Affected Environment

This section briefly describes the existing environmental conditions of the potentially affected geographic area and focuses on those environmental resources potentially susceptible to adverse impacts.

3.1 Marine Environment

The variety of marine habitat found in the vicinity of Petersburg ranges from calm protected embayments to high energy, wave-swept exposed coastlines. The vast majority of the Petersburg waterfront area is rocky shoreline. However, the seafloor in the harbor can be described as flat, featureless sediment with the primary exception of man-made debris, with few epibenthic organisms except those anchored to bottom debris or to pilings. In April 2011, individual or small aggregations of sea urchins (*Strongylocentrotus spp*.) and lesser quantities of Sea Stars (*Asteria spp.*) occupied portions of the harbor floor, with little kelp and aggregations of one unidentified marine macrpopytesalgae evident. Several different genera of sea anemones (mostly *Meretridium* and *Anthopleura* spp.) heavily colonize wood and metal structures. As noted in the report titled "Final Chemical Data Report, Petersburg North Harbor Maintenance Dredging, Petersburg, Alaska", USACE May 2001, the bottom of the harbor is strewn with substantial amounts of human refuse including in part, fishing gear and tackle, vessel and dock parts, small skiffs, a bathtub, cable (wire rope), and many other assorted types of debris. Impacts to the substrate that degrade the harbor's habitat value include the frequency with which prop wash disturbs sediments, frequency of disturbance related to vessel traffic, hydrocarbon and heavy metals contaminating the harbor floor, and a resulting patchiness and limited diversity of aquatic vegetation. Because of the poor condition of the habitat and disturbance levels, the harbor provides limited habitat for fish and mollusks.

Fish species found within the Petersburg area include king salmon, sockeye salmon, coho salmon, pink salmon, chum salmon, Dolly Varden, steelhead trout, rainbow trout, halibut, lingcod, Pacific cod, greenling, herring, and rockfish (species).

3.1.1. Water Quality and Circulation

Tides. Petersburg's diurnal tidal range is approximately 16.4 feet. The extreme tidal range is 25.0 feet with a mean range of 13.8 feet. Petersburg lies within a two-layered estuarine circulation system common in Southeast Alaska. It is a seasonal phenomenon beginning during spring thaw with an increase in freshwater discharge. The freshwater flows seaward along the surface (of the ocean) and is replaced by saline water intruding at greater depths. During fall and winter, storms and reduced runoff combine to thoroughly mix the layers and destroy the system (USACE, 1989).

Currents. Mid-channel current velocities 300 yards from the face of the docks are reported to be as high as 7 knots (USACE 1977). Velocities within the harbor are stated as being much less but were not numerically quantified within that reference. However, the estimated current for the North Harbor vicinity (Tides & Currents software Version 3.7.0.117) in North Harbor is as follows:

average maximum flood tide 3.2 knots, average maximum ebb tide 2.1 knots. The maximum available fetch at maximum tides is reported to be approximately one-half mile.

Sediment Transport. As noted in USACE 1977, the primary input for upland sediments is sediment load moving downstream in Hammer Slough through Middle Harbor and then northwest into North Harbor. The estimated rate of deposition from Hammer Slough is 200 cy per year. The report also notes that the primary input of marine derived sediments results primarily from tidal flood and ebb currents moving through the Wrangell Narrows at an average mid-channel rate of 3.7 and 3.4 knots, respectively. Mid-channel velocities can reach as high as 8 knots. No separate estimate of the rate of deposition or erosion of sediments resulting from Wrangell Narrows influence is available, nor is a combined estimate of the rate of fresh water and marine deposition or erosion available.

Sediment Quality. Harbor construction efforts conducted in 1937 and 1957 with subsequent dredging and sampling events have defined the following in relation to North Harbor sediments. The 1969 to 1971 maintenance dredging effort resulted primarily in sand and silts being dredged, with substantial quantities of hard boulder blue clay being encountered in some areas (USACE 1977). The most recent contaminant testing of North Harbor substrates in 2010 and 2011 determined that contaminants were present. The results of the 2010 testing and follow-up testing in September 2011 (to fill data gaps) determined that ADEC upland soil cleanup levels for the following contaminants were exceeded: Benzo(a)pyrene (a constituent compound of some fuels), diesel-range fuel, arsenic, chromium, and copper (USACE September 2011). It also found that samples contained several polynuclear aromatic hydrocarbons (PAHs) analytes, pesticides and metals (arsenic, chromium, and mercury) and exceeded the Puget Sound Dredged Disposal Analysis (PSDDA) screening levels and/or Alaska's "Over 40-inch Zone" screening criteria (USACE June 2011).

Terrestrial soils in the area are generally hard, gravelly, blue clay and in areas are thin over metamorphic bedrock; outcrops of bedrock are common in the area (USACE 1977). The material to be dredged from North Harbor based on 2001, 2010, and 2011 sampling efforts is predominantly silty sand with small amounts of gravel. The average silt content in 15 grab samples collected in April 2011 was 36 percent. The Corps collected sediment samples for chemical analysis from the North Harbor in 2001, 2010, and 2011. Each of these reports is attached to this EA for reference. A Clean Water Act 404(b)(1) Guidelines analysis of the effects of "disposal" of dredged material resulting from the dredge action is attached. Disposal in relation to the attached 404(b)(1) analysis refers to re-suspension of sediments resulting from dredging, erosion of sediments from the bucket as it moves through the water column and sediments entering the water column as a result of de-watering of dredged materials. The results of the analysis demonstrate that the proposed dredging action would be in compliance with the 404(b)(1) Guidelines and State Water Quality regulations.

Water Quality. Despite some localized legacy hydrocarbon and metals contamination within the harbor, water quality within North Harbor is good due to the moderate to high velocity currents transiting the area and the overall higher water quality in Fredrick Sound and Wrangell Narrows. Water movement within the Petersburg Harbor basins is heavily influenced by strong tidal currents within Wrangell Narrows. The current at flood tides runs to the southwest at an average rate of 3.7 knots, then reverses during ebb tide to an average rate of 3.4 knots; the maximum current is 6.1 knots. The slack tide period before the current reverses is reportedly very brief, perhaps less than an hour. Since most structures within the harbors are on pilings rather than breakwaters, there is little to impede water driven by these currents from flowing through the exposed harbor basins. Heavy ripple marks seen in some of the bottom sediments of the harbors attest to the strong currents within the harbors. On the other hand, the harbors experience very little wave action.

3.1.2 Mammals

The following NMFS-managed marine mammals have been observed in the Petersburg area: killer whales, humpback whales, Steller sea lions, and harbor seals. The only USFWS-managed marine mammal known to occur in the Petersburg area is the northern sea otter. All marine mammals are protected under the Federal Marine Mammal Protection Act (MMPA), and selected marine mammals are also protected under the Endangered Species Act (ESA).

Killer Whale. In general, it is likely that transients and resident populations of killer whales use Frederick Sound habitats when seeking foraging opportunities. They are known to cruise the open water portions of Frederick Sound and transit channels to inner Frederick Sound, probably feeding on salmon. Although their visits to inner Frederick Sound does not appear to be frequent, the habitats within the project area likely provide important prey or other attributes important for this species.

Harbor Seals. Near Petersburg, harbor seals congregate and pup in Leconte Bay. Dozens of isolated mother-pup pairs are found in Leconte Bay between May and June. Near the end of July, mothers and pups separate and additional seals enter the bay. It is not uncommon to see hundreds of seals dotting the icebergs during this time. In general, harbor seals can be found throughout Frederick Sound.

Northern Sea Otter. Sea otters in the Southeast Alaska stock are not listed as “depleted” under the MMPA or listed as “threatened” or “endangered” under the ESA. However, all northern sea otters are listed by the State of Alaska as a species of special concern under their listing program. A Species of Special Concern is any species or subspecies of wildlife or population of mammal native to Alaska that has entered a long-term decline in abundance or is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance. In general, northern sea otters are widely distributed in Southeast Alaska. During spring surveys around Japonski Island (FAA 2009), a total of 45 sea otters were observed; however, several sightings were likely repeat sightings of the same individuals.

Other Marine Mammals. The following marine mammal species have been observed in Southeast Alaska and may occur near Petersburg on an infrequent to rare basis: minke whale, fin whale, sperm whale, Pacific white-sided dolphin, and pygmy sperm whale. Based upon available information, these species are unlikely to rely upon habitats in the project area, but may travel within the vicinity of Petersburg (FAA, 2009).

The humpback whale and Steller sea lion (both the eastern distinct and western distinct populations) are protected under the ESA and their status is discussed, respectively, in sections 3.3.1 and 3.3.2 (Threatened and Endangered Species).

3.1.3 Fishery Resources and Essential Fish Habitat

Many species of fish and shellfish reside in the project area. Chief among them are Pacific salmon and herring, various species of bottomfish, and several species of crab, shrimp, and other shellfish. Many other groups of fish contribute to the Frederick Sound forage base, each of which is represented by many species: rockfishes, greenling, flatfishes, blennies, sculpins, poachers, gunnels, and eelpouts.

Pacific herring is an ecologically and commercially important fish species that occurs abundantly in both the project and surrounding area. Pacific herring typically congregate in large schools at traditional sites along the shore, spawning in shallow vegetated areas in the intertidal and subtidal zones. All its life stages are central to the marine food web. Herring provide an abundant, high energy food source for a wide variety of fishes, mammals, and birds. Herring are also commercially important, and support a roe fishery in Southeast Alaska that remains one of the largest and most valuable roe fisheries in Alaska. The Pacific herring (Southeast Alaska distinct population segment) is an ESA candidate species and is discussed in more detail in section 3.3.3 (Threatened and Endangered Species).

Section 305(b)(2) of the Magnuson-Stevens Fisheries Conservation and Management Act (MSFCMA) requires all Federal agencies to consult with the Secretary of Commerce on all actions or proposed actions authorized, funded, or undertaken by the agency that may adversely affect essential fish habitat (EFH). EFH is defined in the MSA as "…those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The proposed project is within an area designated as EFH for two fishery management plans (FMP) — Gulf of Alaska Groundfish and Alaska Stocks of Pacific Salmon (NMFS 2005a, NMFS 2005b). These two FMPs include 23 species or species complexes of groundfish and invertebrate resources and the five Pacific salmon species (table 2). Most probable species to be found in the project area include salmonids, sculpins, flatfish, rockfish, and forage fish. For a description of the life history stages of these species, refer to the relevant EFH designations in NMFS, 2005a and b. Appendix 2 contains the required EFH assessment, which includes a discussion of the possible effects of the proposed corrective action.

Table 2. Fish with designated essential fish habitat in the Gulf of Alaska Fishery Management Plan area (FAA, 2009; Appendix 3).

Gulf of Alaska Ground Fish		**Alaska Stocks of Pacific Salmon**
Skates (Rajidae)	Shortraker rockfish	Chinook salmon
Pacific cod	Northern rockfish	Coho salmon
Walleye Pollock	Dusky rockfish	Pink salmon
Thornyheads	Yellowfin sole,	Chum salmon
Pacific Ocean perch	Arrowtooth flounder	Sockeye salmon
Rougheye rockfish	Rock sole	
Yelloweye rockfish	Alaska plaice	
Rex sole	Sculpins (Cottidae)	
Dover sole	Sharks	
Flathead sole	Forage fish complex	
Sablefish	Squid	
Atka mackerel	Octopus	

3.2. Avifauna

In broad terms, many species, such as common raven, northwestern crow, and gulls are consistently present across seasons. Shorebirds exhibit some degree of seasonality, with higher numbers occurring during spring migration and reduced numbers in winter months. Waterfowl can also be found in and around the Petersburg area. Sea ducks, divers, and puddle ducks can all be found throughout Southeast Alaska depending on the season.

The bald eagle is the only raptor directly associated with the marine environment in the Petersburg area; however, merlin and northern harrier probably frequent the Petersburg area as they were found around Sitka (FAA, 2009). Bald eagles typically hunt fish in near shore and open water, snatch alcids, seabirds, and gulls flushed from the water or land, and scavenge carrion washed into the intertidal zones.

The USFWS lists marbled murrelets as a species of high concern in Alaska (USFWS, 2006). They are also listed as being of high concern in North America and endangered globally, according to the

USFWS Alaska Seabird Information Series. The Queen Charlotte goshawk, peregrine falcon, olive-sided flycatcher, and Townsend's warbler are listed as special species of concern by ADF&G and also have the potential to exist in the project area.

3.3. Threatened and Endangered Species

The following NMFS-managed ESA species may occur in the project area: humpback whale (endangered); Steller sea lion (threatened eastern population and endangered western population). The Pacific herring Southeast Alaska Distinct Population Segment (DPS) is a NMFS Candidate species. No USFWS-managed ESA species exist in the project area. A brief summary about each species' presence in the Petersburg Harbor area follows.

3.3.1 Humpback whale

Humpback whales were listed as endangered under the ESA in 1970, depleted under the MMPA in 1972, and endangered under the State of Alaska Endangered Species list. This species travels through and forages in Frederick Sound throughout the year but is most abundant in spring and summer months. Local boaters have observed humpback whales in the project area "lounging," or resting in Frederick Sound.

3.3.2 Steller Sea Lion, Eastern and Western Distinct Population Segments

In 1997 the NMFS recognized two DPSs: the western DPS and eastern DPS. The segment of the population west of 144° W longitude was listed as "endangered," while the segment of the population east of this delineation remained listed as "threatened." There is no critical habitat designated within the Corps' project area for the western and eastern populations. However, there is one major eastern Steller sea lion haulout approximately 15 miles southwest of Sitka Harbor at Biorka Island. Eastern Steller sea lions occur in Frederick Sound throughout the year, but are in much higher numbers during the spring herring season. Banded western Steller sea lions have been observed within Southeast Alaska eastern Steller sea lion critical habitat: the Kaiuchali Island haulout and the Biali Rocks rookery. From 2001 to 2006, 274 total sightings of western Steller sea lions were recorded in Southeast Alaska; however, these sightings likely represented 66 individuals repeatedly observed: Of the 66 western animals seen in Southeast Alaska, only two tagged western Steller sea lions have been observed at haulouts near Sitka Sound (FAA, 2009).

3.3.3 Pacific Herring, Southeast Alaska Distinct Population Segment

On April 11, 2008, the NMFS announced (73 FR 19824) that they would be initiating a status review for the Pacific herring Southeast Alaska DPS. Status reviews are comprehensive assessments of a species' biological status and its threats, and are the basis for making determinations as to whether a species warrants listing under the ESA. In Southeast Alaska, at least five major herring populations are identified by managers: Sitka, Auke Bay, Craig-Hydaburg, Deer Island-Etolin Island (near Wrangell), and Ketchikan.

3.4. Subsistence Resources

Subsistence Fishing – For season dates, species, locations applicable to the Petersburg area, see ADF&G 2010 – 2011 Subsistence and Personal Use Statewide Fisheries Regulations, Southeastern Alaska Area and related State laws applicable to Native Corporation and Native allotment lands, and USFWS, Subsistence Management Regulations for the Harvest of Wildlife and Federal Public lands in Alaska, July 1, 2010 – June 30, 2012. Subsistence data for Petersburg, Alaska noted that salmon made up 22.92 percent of the fish subsistence harvest (NOAA, 2005).

Subsistence Hunting - State laws applicable to Native Corporation and Native allotment lands, and USFWS, Subsistence Management Regulations for the Harvest of Wildlife and Federal Public lands in Alaska, July 1, 2010 – June 30, 2012. Subsistence data for Petersburg, Alaska noted that marine mammals did not figure significantly into the composition of the subsistence diet. Of the subsistence diet, 28.95 percent is from terrestrial mammals and 1.80 percent from birds and egg's. Foraging for marine invertebrates and vegetation made up 19.49 percent and 4.36 percent, respectively (NOAA, 2005).

3.5. Cultural and Historic Resources

The Petersburg area was inhabited by Tlingit Native peoples until the 1890's when Norwegian fisherman began moving into the area. The community has a retained a distinctly Norwegian flare. The community largely revolves around fishing and tourism as timber harvesting has gradually fallen off.

Cultural Resources (historic, archaeological, paleontological) – Section 106 of the National Historic Preservation Act of 1966, requires determination, in part, if there are historic properties, cultural resources, traditional cultural resources etc. that would be affected by the proposed project (e.g. within the area of potential effect [APE]). Corps site visits and review of the Alaska State Historic Preservation Office (SHPO) Alaska Heritage Resources Survey (AHRS) database has found no such resources within the APE. Nor has the Corps received information from consulting entities prior to the public notice being issued that such resources exist within the APE.

3.6. Air and Noise Quality

Petersburg, Alaska is not classified as a non-attainment area. Neither EPA's webpage nor the State of Alaska's DEC air quality webpage document any record of air quality issues at Petersburg. As a coastal community adjacent to a continental land mass, the area experiences the usual alternating (day versus night) flows of air currents resulting from the repetitive heating and cooling of large land masses, and therefore, a "flushing" effect.

3.7. Socioeconomic Resources

3.7.1 Population

Based on 2010 U.S. Census data information, Petersburg's approximate demographic profile breaks down as follows: population – 2,948, 51.2 percent male, 48.8 percent female; a median age of 36 years; 80 percent Caucasian; 0.4 percent African American; 7.0 percent Native Alaskan or Native American; 3.2 percent Asian; and 9.4 percent other (http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk).

3.7.2 Employment and Income

Historically, the Petersburg economy has been based primarily on fishing and timber harvesting. Current primary employment sectors include government and fishing. The community is currently experiencing a continuation of a 10-year trend in declining population that mimics most communities in Southeast Alaska but is contrary to the trend for the State overall. Employment and real growth in commercial sectors are trends that also go against trends for the State overall.

3.7.3 Marine Economic Activity

Petersburg's North Harbor (where the dredging will occur) has 143 slips currently occupied by 84 commercial fishing vessels 30 to 90 feet in length, 1 charter fishing vessel 28 feet in length, 31 recreational vessels 17 to 45 feet in length, 1 industrial landing craft 65 feet in length, 1 governmental vessel 105 feet in length, 1 float house owned by the harbor, and 24 empty stalls that will be occupied during the summer season. Other than commercial fishing, no other major commercial navigation (overseas shipments of timber products and shipping of processed fish) utilizes North Harbor, nor do the smaller cruise ships, ferry vessels, or float planes that navigate within the overall area. North Harbor is served by a single boat ramp in the harbor. Access to Ocean Beauty and Icicle Seafood canneries is via Wrangell Narrows on the approaches to North Harbor. Access to Trident Seafoods cannery is gained only by going through North Harbor. The various Rivers and Harbors Acts (RHA, 30 August 1995, 2 March 1945, 2 September 1954) that authorize federal dredging in this area authorized dredging of North Harbor, its approaches, and the former U.S. Forest Service berth. North Harbor serves primarily commercial fishing vessels accessing the canneries and/or commercial and private vessels docked there.

4.0 Environmental Consequences

This section discusses how the no-action alternative and the proposed maintenance dredging might affect the Petersburg Harbor area's environmental resources of concern.

"Significance" as used in the National Environmental Policy Act (NEPA) requires considerations of both context and intensity. "Context" means that the significance of an action must be analyzed in several contexts such as the affected region, affected interests, and the locality. "Intensity" refers to the severity of impact, including the degree to which an action may adversely affect an endangered or threatened species or its critical habitat.

The direct effects study area encompasses the footprint of the maintenance dredging and the protective marine waters behind them. Within this area, resources that are present could be directly affected by physical disturbance associated with implementation of the project.

The indirect effects study area is larger than the direct effects study area and encompasses those marine areas in the vicinity of the harbor where indirect effects such as temporary increases in turbidity as a result of dredging might occur.

NEPA requires that cumulative effects be evaluated along with the direct and indirect effects of the actions. Cumulative impacts on the environment result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. As with direct and indirect effects, the no-action alternative serves as the baseline against which to evaluate cumulative effects.

Major past projects in vicinity of the Corps' project area includes shoreline development related to Petersburg's growth and the construction of the original Petersburg Harbor. Overall, the Petersburg area is not heavily developed. Reasonably foreseeable future actions include continued harbor growth and development related to commercial and recreational fishing.

4.1 Marine Environment

The proposed dredging action at the small boat harbor at Petersburg and the upland placement of the dredged material at the landfill would not alter the hydrologic conditions or sediment transport in the harbor or surrounding marine environment.

4.1.1 Water Quality and Circulation

Dredging operations would be conducted to minimize turbidity and reduce sediment movement through the use of a clamshell dredge. All material dredged would be placed in a scow barge and offloaded by the clamshell dredge into watertight trucks to be transported to the landfill for final placement.

The proposed action would reduce water quality during and immediately following dredging. The suspension and transport of sediments is a direct result of dredging activities. During dredging, the concentration of contaminants in the water column would increase along with turbidity, thus increasing the exposure of salmonids and prey species. Also, the concentration of dissolved contaminants would increase due to the disturbance of the substrate. The increase in turbidity and particulate and dissolved contaminants is expected to be localized, short-term, and would dissipate within several hours.

4.1.2 Mammals

Construction noise, construction vessel traffic, and construction-generated turbidity related to maintenance dredging would temporarily and indirectly disturb marine mammals near the site. Airborne noise would be generated by the operation of heavy equipment, and waterborne noise

would be generated by work boats and the clamshell dredge. At levels of sound resulting from the work activities, expected to be less than 150 dB re 1 uPa, the primary reaction of marine mammals is likely to be to move away from the work area during the construction period. Similarly, the noise generated by barges and tugs in transit to or from the work area from other locations in Southeast Alaska would be similar to that generated by routine small vessel traffic in the shipping lanes. Low levels of turbidity would be generated by dredging and placing the material on the barge in the marine environment, causing marine mammals to temporarily avoid the area until such time that the construction-generated plume dissipates to background levels.

Overall, the Corps's project would likely cause marine mammals that would otherwise be present in the vicinity to move away from the area temporarily during construction but would not likely produce significant long-term harm to any species.

4.1.3 Fishery Resources and Essential Fish Habitat

Maintenance dredging would have little direct effect on mature fish inhabiting the project area, as their mobility allows them to avoid construction activities (e.g. clamshell dredging, generated turbidity, vessel movements, and underwater construction noise). No long-shore movements of juvenile fish would be disrupted by maintenance dredging.

Per the 1996 amendments to the MSFCMA, the Corps has initiated consultation and coordination with the NMFS regarding the potential effects of the recommended corrective action on EFH. Impacts from implementation of project alternatives would result in short-term alterations of EFH for marine species and species such as rockfish, flatfish, gadids, salmonids. There would also be short-term impacts on forage fish such as capelin and sand lance as well as for species such as Pacific herring that are important prey for species with designated EFH. The Corps concludes that its Federal action may affect, but is not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon. See Appendix 2 for the Corps' EFH assessment.

4.2 Avifauna

Primary activities possibly affecting local avian populations within and in proximity to the project site are the to-and-from mobilization of construction equipment, vessels and personnel, and dredging. Vessels moving through the area to access the harbor could displace waterfowl and sea ducks within their intended course. Vessel lights could become an attractive nuisance causing bird collisions and subsequent injury or death; however, there is more potential for environmental impacts associated with vessels relating to the effects of petroleum compounds and other hazardous materials spills. The effects of fuel spills on avian populations are well documented, as direct contact and mortality is caused by ingestion during preening as well as hypothermia from matted feathers. The displacement of local avian populations from the project area during construction would be short-term. Overall, the Corps believes that the recommended corrective action would not have a long-term effect on local avian populations. No significant adverse impacts are expected.

4.3 Threatened and Endangered Species

Section 7 of the ESA requires that any action by a Federal agency shall ensure that its actions are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat of such species.

Project construction activities would result in temporary alterations to habitat used by Steller sea lions and Pacific herring. Vessel noise and transit associated with construction activities have the potential to cause avoidance, disturbance, or displacement of Steller sea lions and humpback whales from the Petersburg area during peak Pacific herring spawning activities when Steller sea lions and humpback whales feed on staging and spawning adult herring. Therefore, the Corps has proposed to cease in-water construction during peak Pacific herring spawning activities (between March 15 and June 1). Construction activities outside this period coincide with periods when a minimum quantity of marine mammals is present. Additionally, speed limits would be imposed on construction vessels moving between the project area and material suppliers to mitigate the danger of vessel-marine mammal collisions.

The Corps believes that its proposed action: (1) would not modify or adversely affect designated critical habitat; and (2) would not affect humpback whales, Steller sea lions (eastern and western distinct population segment) or Pacific herring (Southeast Alaska distinct population segment).

4.4 Subsistence Resources

The Alaska Native Interest Lands Conservation Act identifies three factors related to subsistence uses as items affected by changes in management activities or land uses: (1) resource distribution and abundance; (2) access to resources; and (3) competition for the use of resources.

Subsistence resources, such as marine plants and animals affected primarily by the various alternatives are predominantly food resources collected for primary diet, customary and traditional practices, or to supplement other existing food resources.

Maintenance dredging on the sea floor within the harbor would temporarily affect local fishing within the harbor. Short-term impacts to fish occurring within the harbor would be minimal, as dredging temporarily increased turbidity within the harbor. However, due to tidal currents, water conditions would likely return to normal within a couple of hours following dredging activity.

The Corps is unaware of any herring-spawn harvesting within the harbor at Petersburg; however, should it occur, the impacts on that activity would be short term. In conclusion, the Corps believes that there would be no anticipated significant impacts to marine-related subsistence resources or access to and competition for subsistence resources from the corrective action.

4.5 Cultural and Historic Resources

The Alaska State Historic Preservation Officer (ASHPO) concurred with the Corps' initial determination that the maintenance dredging would have no effect on any historic or prehistoric

resources in the area. The Corps believes that the maintenance dredging is not expected to impact the historic properties described in Section 3.5 (Cultural, Historical and Archeological Resources), and is coordinating its findings with the ASHPO.

4.6 Air and Noise Quality

The proposed dredging action would not increase airborne particulate matter in the project area above acceptable threshold levels. Operation of dredging machinery and other equipment would cause a minor, temporary increase in air emissions because of exhaust, which would cease once dredging is completed. There also would be localized increases in noise levels from dredging, barging, offloading, and trucking of the material. Noise levels would not likely be noticeable over ambient conditions at either the dredging or offloading sites as both are adjacent to or near industrial areas, port facilities, boat operations, and other sources of noise and artificial light

To be considered 'regionally significant,' emissions associated with the project must exceed 10 percent or more of the region's emissions for a particular pollutant (http://www.dec.state.ak.us/air/index.htm). Although no analysis was done, it is clear that this short-term and relatively minor dredging project would contribute far less than 10 percent for the area of pollutants such as carbon monoxide (CO), volatile organic carbon (VOC), particulate matter (10 micrometers or less, PM_{10}), and NOx (nitric oxide and nitrogen dioxide). National ambient air quality standards are not expected to be exceeded.

4.7 Socioeconomic Resources

The proposed action would remove the shoaled areas of the harbor, which would alleviate the impact to navigation. Waterborne commerce would remain the primary component of the local and regional economy. The proposed action would not change the type or quantity of goods and services at the harbor. Some short-term interference to commercial and recreational traffic could occur during dredging and transportation of dredged material to the upland placement site. However, these conflicts are expected to be an inconvenience rather than an impact to commercial and recreational activity. Also, no long-term impacts would occur to recreational activities in the area. In addition, the proposed action would not cause changes to population or other indicators of social well being, and would not result in disproportionately high or adverse effects to minority populations or low-income populations.

The City of Petersburg owns the landfill and is coordinating with ADEC to meet all the requirements for the disposal of contaminated dredged material.

4.8 Environmental Justice and Protection of Children

On February 11, 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations was issued. The purpose of the order is to avoid the disproportionate placement of Federal actions and policies having adverse environmental, economic, social, or health effects on minority and low-income populations. Construction of the

proposed corrective action would have beneficial effects on the Petersburg community. No racial, ethnic, age, or other population group would be adversely affected disproportionately.

On April 21, 1997, Executive Order 13045, Protection of Children from Environmental Health and Safety Risks was issued to identify and assess environmental health and safety risks that may disproportionately affect children. The proposed action would affect the community as a whole, and there would be no environmental health or safety risks associated with the action that would disproportionately affect children. All the alternatives considered in detail are located offshore, in proximity to commercially developed areas, and away from homes, schools, and playgrounds. Children would not be put at risk by the proposed corrective action.

4.9 Cumulative Effects

Cumulative effects are defined as, "The impact on the environment which results from the incremental impact on an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions" (40 Code of Federal Regulations, Section 1508.7). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time. The past and present actions that have occurred within and adjacent to the harbor project area are identified below. Together, these actions have resulted in the existing conditions of the project area (see Section 2).

- 1937- The original harbor project is successfully completed.
- 1957- Shoreward enlargement of the basin and dredging the outer one-third of the basin to -15 feet MLLW is completed.
- 1969- Maintenance dredging occurs in south end of the basin in June.
- 1971- Dredging is resumed in the south end of the basin in October until project depth is obtained.
- Continued commercial, industrial, and residential development that has occurred throughout the project area and adjacent uplands at different times over the years.

The reasonably foreseeable future actions under consideration in this analysis are identified below. The list includes relevant foreseeable actions within and adjacent to the harbor, including those by the Corps, other Federal agencies, State and local agencies, and private and commercial entities.

- Continued operation and maintenance of the harbor to the various design depths plus 1 foot of overdepth.
- Continued use and development of the project area, including areas adjacent to the harbor for commercial, industrial, and residential uses in proportion to any future increases in population within the Petersburg area.
- Continued operation and maintenance of private berths and terminals associated with the harbor.

4.9.1 Marine Environment

Future development, construction activities, and other foreseeable future projects, in combination with population growth within and adjacent to the project area, would produce changes in the amount of impervious surfaces and associated runoff in and around the harbor and adjacent watersheds. However, all projects are required to adhere to local, State, and Federal stormwater control regulations and best management practices, which are designed to limit surface water inputs.

4.9.2 Biological Resources

Biological resources include fish and wildlife, vegetation, wetlands, Federal threatened and endangered species, other protected species. The legacy contamination, development, and industrial use in the harbor would continue to impede aquatic systems from returning to natural species richness, community structure, and ecological function. While historic development within and adjacent to the project area has caused some loss of aquatic habitat, these actions occurred in a regulatory landscape that is different from today. While future development will likely have localized impacts on these resources, under the current regulatory regime these resources are unlikely to suffer significant losses. Any future Federal actions would require additional evaluation under the National Environmental Policy Act at the time of their development.

4.9.3 Cultural and Historic Resources

The harbor has been dredged in the past. No cultural and historic resources are expected to be impacted by the proposed dredging action. The landfill has been used many times for deposition of local refuse. No cultural and historic resources are expected to be impacted by the proposed dredged material placement action. Reasonably foreseeable future actions within and adjacent to the developed project area are subject to review and approval by the State Historic Preservation Officer, and would be anticipated to have minor impacts, if any, on cultural resources.

4.9.4 Air and Noise Quality

The proposed action and the past, present, and reasonably foreseeable actions identified above are not anticipated to result in cumulatively significant air quality deterioration as defined by the State of Alaska. Noise associated with the proposed action also would occur. These noise impacts would be localized, short-term, and of an intermittent nature and are not expected to be cumulatively significant.

4.9.5 Socio-economic Resources

The proposed action and future Corps maintenance dredging activities would alleviate shoaling impacts to navigation and would not change the type or quantity of goods shipped or the type or size of commercial vessels transiting the harbor. Waterborne commerce would remain an important component of the local and regional economy.

Some short-term interference to recreational and commercial traffic could occur during proposed and future dredging and material placement activities, including Corps' maintenance dredging of the harbor and any future dredging that may be recommended. However, these conflicts are expected to be an inconvenience rather than a direct impact to commercial and recreational activity. The proposed action, when added to other past, present, and reasonably foreseeable future actions is not expected to cause a cumulative adverse change to population or other indicators of social well being, and should not result in an adverse effect, and as a result, there would be no disproportionately high or adverse effect on minority populations or low-income populations.

Petersburg owns the landfill where the material is going to be placed. Petersburg is working with ADEC to prepare the landfill to meet all requirements for placing the contaminated material at the site.

4.9.6 Cumulative Effects Summary

The cumulative impacts analysis evaluated the effects of implementing the proposed action in association with past, present, and reasonably foreseeable future Corps' and other parties' actions within and adjacent to the project area. Past and present actions have resulted in the present conditions in the harbor. Reasonably foreseeable future actions that have been considered included relevant foreseeable actions within and adjacent to the project area, including those of the Corps, other Federal agencies, State and local agencies, and private and commercial entities. The cumulative impacts associated with implementation of the proposed action were evaluated with respect to each of the resource evaluation categories, and no cumulatively significant adverse impacts were identified.

5.0 PUBLIC INVOLVEMENT, FEDERAL COMPLIANCE AND AGENCY COORDINATION

This EA and Finding of No Significant Impact (FONSI) have been prepared based on previous NEPA-related scoping efforts, public input associated with the Petersburg Harbor, and the most recent correspondence with State and Federal resource agencies. Per the NEPA process and Corps regulations and guidance, the EA and FONSI are subject to a 30-day public review. If requested, a public meeting would be held to discuss project alternatives and solicit public views and opinions.

5.1 Compliance with Laws and Regulations

The development and preparation of this EA and FONSI is being coordinated with a variety of State and Federal agencies. An evaluation to determine consistency with Section 404(b)(1) of the Clean Water Act, which governs discharge of dredged or fill material, has been completed (Appendix 1).

Both the Corps and ASHPO determined that the project would have no effect on known historical or prehistoric resources in the Petersburg area.

The ADEC determines compliance with State of Alaska water quality standards under Section 401 of the Clean Water Act. The Corps determined that the proposed corrective action would not violate State water quality standards. The Corps is coordinating their determination with the ADEC, and if they concur, they would issue a water quality certificate if there is reasonable assurance that the proposed corrective action would meet and maintain the standards.

A checklist of project compliance with relevant Federal, State, and local statutes and regulations is shown in table 3.

Table 3. Environmental Compliance Checklist

FEDERAL	Compliance
Archeological & Historical Preservation Act of 1974	FC
Clean Air Act	FC
Clean Water Act	PC
Coastal Zone Management Act of 1972 *	NA
Endangered Species Act of 1973	PC
Estuary Protection Act	FC
Federal Water Project Recreation Act	FC
Fish and Wildlife Coordination Act	FC
National Environmental Policy Act *	PC
Land and Water Conservation Fund Act	FC
Marine Protection, Research & Sanctuaries Act of 1972	FC
National Historic Preservation Act of 1972	FC
River and Harbors Act of 1899	FC
Magnuson-Stevens Fishery Conservation & Management Act *	PC
Marine Mammal Protection Act	PC
Bald Eagle Protection Act	FC
Watershed Protection and Flood Preservation Act	FC
Wild & Scenic Rivers Act	N/A
Executive Order 11593, Protection of Cultural Environment	FC
Executive Order 11988, Flood Plain Management	FC
Executive Order 11990, Protection of Wetlands	FC
Executive Order 12898, Environmental Justice	FC
Executive Order 13045, Protection of Children	FC
STATE AND LOCAL	
State Water Quality Certification *	PC

PC = Partial compliance, FC = Full compliance
*Full compliance will be attained upon completion of the Public Review process and/or coordination with the responsible agency.

6.0 CONCLUSIONS AND MITIGATION RECOMMENDATIONS

The Corps concludes that the recommended maintenance dredging in the harbor at Petersburg, Alaska, is consistent with State and local coastal zone management programs to the maximum extent practicable. The Corps also concludes that the EA supports the conclusion that the navigation improvements do not constitute a major Federal action significantly affecting the quality of the human environment. Therefore, preparing an environmental impact statement is not necessary and signing a FONSI is appropriate.

7.0 Literature Cited

Alaska Department of Environmental Conservation (ADEC). Air Quality Webpage: http://www.dec.state.ak.us/air/index.htm

Federal Aviation Administration. 2009. Final Environmental Impact Statement. Sitka Rocky Gutierrez Airport, Sitka, Alaska. Anchorage, AK. May. http://www.sitkaeis.com/feis.htm

National Marine Fisheries Service (NMFS). 2005a. Essential Fish Habitat Assessment Report for the Groundfish Resources of the Gulf of Alaska Region, Appendix F.1, NMFS Alaska Region, Juneau, Alaska.

_____. 2005b. Essential Fish Habitat Assessment Report for the Salmon Fisheries in the EEZ off the Coast of Alaska, Appendix F.5, NMFS Alaska Region, Juneau, Alaska.

NOAA Technical Memorandum NMFS-AFSC-160. 2005. Community Profiles for North Pacific Fisheries – Alaska, December 2005.

_____. http://alaskafisheries.noaa.gov/habitat/efh.htm, February 10, 2011.

Tides& Currents Pro, Version 3.7.0.117: Software utilized to estimate current velocities in Wrangell Narrows

USACE, A Study of Dredging Means and Disposal Methods in Eighteen Alaskan Small Boat Harbors, September 30, 1977.

USACE, Technical Memorandum, Chemical and Physical Data Pertaining to Placement of Dredged Harbor Sediment at Petersburg Landfill, September 2011.

USACE, May 2001, report titled “Final Chemical Data Report, Petersburg North Harbor Maintenance Dredging, Petersburg, Alaska, USACE, May 2001.

USACE, Chemical Data Report, Petersburg Small Boat Harbor Sediment Study, Petersburg Small Boat Harbor, Petersburg, Alaska, P#2 138810 NPDL# 11-051. June 2011.

http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk: U.S. 2010 Census Data for Petersburg, Alaska.

USACE, ERDC TN-DOER-E21. 2005. Silt Curtains as a Dredging Project Management Tool, current velocity limits for silt curtains, September 2005.

USGS. 1995. Overview of Environmental and Hydrogeologic Conditions near Petersburg, Alaska.

APPENDIX 1

404(b)(1) Analysis

ASSESSMENT

Petersburg Small Boat Harbor

Maintenance Dredging

Petersburg, Alaska

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EVALUATION UNDER SECTION 404(b)(1) of the CLEAN WATER ACT
Petersburg North Harbor
Operations & Maintenance Dredging

This is the factual documentation of evaluations conducted under Section 404 of the Clean Water Act of 1977. This report covers the removal of material from Petersburg North Harbor and the incidental re-suspension of sediment during dredging and dewatering.

I. PROJECT DESCRIPTION

A. Location: The City of Petersburg, Alaska, is on Mitkof Island roughly 120 miles southeast of Juneau. The city has three adjacent harbor basins fronting Wrangell Narrows: North, Middle, and South.

B. General Description: The environmental assessment (EA), to which this evaluation is appended, contains a discussion of the navigation problems and discussion of alternatives. The North Harbor was last dredged in 1971. The proposed action provides dredging in five areas where shoaling has become apparent within the harbor basin and in front of two docks adjacent to the small boat harbor.

Table 1 – Summary of Proposed Dredging Depths and Volumes

Area	Proposed Dredge Depth Below MLLW (ft)	Estimated Dredge Volume (cy)
1 (harbor basin)	-11 (Required Depth) -12 (Max Pay)	12,550
2 (harbor basin)	-15 (Required Depth) -16 (Max Pay)	3,350
3 (South Dock)	-24 (Required Depth) -25 (Max Pay)	1,900
4 (North Dock)	-24 (Required Depth) -25 (Max Pay)	7,200
5 (North Dock)	-15 (Required Depth) -16 (Max Pay)	1,400
Project Total (to Required Depth): 26,400		

Chemical sampling of the North Harbor sediments in 2010 showed the sediments contained concentrations of certain chemicals above the open-water dredged material disposal screening criteria used by Alaska District. The preferred and most feasible means of disposing of the material is upland placement as cover at the City of Petersburg landfill.

C. Authority: The Rivers and Harbors Act of 30 August 1935 (House Doc. 483, 72nd Congress, 2nd Session) as adopted, provides for dredging suitable approaches to the existing wharves to a depth of -24 feet MLLW, and a small boat basin to a depth of -11 feet MLLW between the current Petersburg Cold Storage and Kayler-Dahl Wharves. Additional authorization was

provided in 1954 to increase the outer one-third of the small boat basin to a depth of -15 feet MLLW.

D. General Description of Dredged or Fill Material: The material to be dredged from North Harbor is predominantly silty sand with small amounts of gravel. The average silt content in 15 grab samples collected in April 2011 was 36 percent. The Corps collected sediment samples for chemical analysis from the North Harbor in 2010. The analyses showed those sediments to be extensively contaminated with fuels, fuel constituent compounds (i.e. polyaromatic hydrocarbons), and metals such as copper. The concentrations of some chemicals exceed Corps of Engineers guidelines for open-water disposal, so alternative means of disposal have been sought.

E. Description of the Proposed Discharge Site: The dredged sediments removed from the harbor will be placed in an upland location rather than being discharged to waters of the United States; the "discharge" site in this evaluation refers to the dredging site itself, which may be impacted by contaminated sediments suspended in the water column during dredging and dewatering activities.

In general, the North Harbor seafloor is flat, featureless sediment, with few epibenthic organisms except those anchored to bottom debris or pilings. In April 2011, sea urchins (*Strongylocentrotus* spp.) covered parts of the harbor floor sediment in dense groups, and little kelp or other marine algae were evident. Several different genera of sea anemones (mostly *Meretridium* and *Anthopleura* spp.) heavily colonize wood and metal structures.

Water movement within the Petersburg Harbor basins is heavily influenced by strong tidal currents within Wrangell Narrows. The current at flood tides runs to the southwest at an average rate of 3.7 knots, then reverses during ebb tide to an average rate of 3.4 knots; the maximum current is 6.1 knots. The slack tide period before the current reverses is reportedly very brief, perhaps less than an hour. Since most structures within the harbors are on pilings rather than breakwaters, there is little to impede these currents from flowing through the exposed harbor basins. Heavy ripple marks seen in some of the bottom sediments of the harbors attest to the strong currents within the harbors. On the other hand, the harbors experience very little wave action.

F. Description of Disposal Method: Discharge would consist of sediments suspended in the water column during dredging and dewatering. The Corps expects that a mechanical bucket dredge would be used to remove sediment from North Harbor and place the sediment in a scow for dewatering. Sediment would be suspended by the action of the dredge pulling away from the harbor bottom, by sediment falling from the dredge bucket, and by run-off from the scow. The strong currents within the harbor basin would make a silt curtain impractical.

II. FACTUAL DETERMINATIONS

A. Physical Substrate Determinations: The discharge site (North Harbor basin) is the same site from which the sediment is being dredged, so sediments settling out within the harbor should be essentially the same as the existing substrate. Due to dispersal by the strong currents, the resuspended sediments should settle out in a thin layer, and not significantly alter the existing topography.

B. Water Circulation, Fluctuation, and Salinity Determinations: The strong tidal currents of Wrangell Narrows flow nearly unimpeded through the Petersburg Harbor system. The sediment suspended in the water column by dredging would be dispersed widely and rapidly, and would not be expected to accumulate in any way that would affect water circulation, tidal fluctuations, or salinity.

C. Suspended Particulate/Turbidity Determinations: The dredging and dewatering activity would result in an unavoidable release of suspended particulates into the water column. However, the strong, unimpeded tidal currents at the dredging location are expected to rapidly disperse the particulates and minimize the extent and duration of high levels of turbidity. These same strong currents are likely to render ineffective conventional sediment control measures, such as silt curtains.

As described in Section D, Corps of Engineers-developed DREDGE software was used to model the quantities of sediment re-suspended in the water column. The model expresses the re-suspended sediment as total suspended solids (TSS). Under the same "near-worst-case" input scenario described in Section D, the DREDGE model predicts a TSS of 53 mg/l within 5 meters (16.4 feet) of the dredging activity at all depths, falling to a TSS of about 11 mg/l at 100 meters down-current. The State of Alaska regulates suspended sediment in terms of turbidity, a measure of optical scattering that cannot be directly correlated to TSS without further empirical data from the project site. The concentrations of TSS would be highly variable and transient over the course of the project due to the cyclical nature of bucket dredging.

No adequate models exist for predicting the contribution to suspended particulates from the dewatering scow. Unlike a hopper barge receiving a continuous discharge from a suction dredge, the addition of sediment to the scow would be intermittent, and the release of water from the scow highly variable, though with a much lower flow rate than with suction dredging. The scow would be positioned near the bucket dredge during dredging, but periodically maneuvered to shore to transfer the dewatered sediment into trucks for upland disposal.

D. Contaminant Determinations: The potential impact of re-suspended contaminated sediment on the water column has been evaluated using the Corps' DREDGE software. A "near-worst-case" scenario was modeled using conservative inputs. The DREDGE modeling results (table 2) suggest that dissolved concentrations of the principle contaminants found in the Petersburg

sediment would be below applicable water quality criteria within 5 meters (16.4 feet) of the dredging activity.

Table 2 – DREDGE Modeled Concentrations of Contaminants in Re-suspension Plume

Chemical Contaminant	Sediment concentration (95% UCL of 2010 data) [mg/kg]	DREDGE-estimated TOTAL contaminant conc. at 5 m downstream [µg/l]	DREDGE-estimated DISSOLVED contaminant conc. at 5 m downstream [µg/l]	State of Alaska/ NOAA water quality standards (acute/chronic) [DISSOLVED µg/l]
Copper	394	20.8	1.58	4.8 / 3.1
Lead	106	5.65	0.07	210 / 8.1
Zinc	309	16.5	0.36	90 / 81
Benzo(a)pyrene	0.884	0.047	0.0236	300
Napthalene	0.076	0.004	0.0039	2,350 / 1.4
Total PAHs	36.7	1.95	0.975	300

E. Aquatic Ecosystem and Organism Determinations: The existing ecosystem within the harbor basin has been impacted by the activities and contaminants present within the harbor, and the organisms there are limited to those able to adapt to the contaminants and debris present, and to the periodic re-suspension of sediment caused by turbulence from boats maneuvering within the shallow harbor. The ecosystem outside of the harbor has not been evaluated. Attenuated portions of the re-suspension plume may extend outside the harbor basin but would be rapidly dispersed in the strong tidal currents of Wrangell Narrows.

F. Proposed Disposal Site Determinations: The "disposal site" would be the North Harbor basin, where the dredging activities would take place. Due to the strong tidal currents, the dispersal of re-suspended sediments would be largely uncontrollable, and the sediment would be spread out in a thin, perhaps undetectable layer over the receiving substrate.

G. Determination of Cumulative/Secondary Effects: The Petersburg boat harbors require infrequent dredging; North Harbor was last dredged more than 40 years ago. Subsequent dredging of North Harbor and the other harbor basins would occur at long intervals, and cumulative effects from repeated dredging should be negligible. No secondary effects are identified.

III. FINDINGS OF COMPLIANCE

A. Adaptation of the Section (404)(b)(1) Guidelines to this Evaluation: The use of these guidelines to evaluate incidental sediment re-suspension during dredging activities (as opposed to bulk dredged material disposal) is the only adaptation of the Section 404(b)(1) Guidelines employed in this evaluation.

B. Evaluation of Availability of Practical Alternatives: Since the dredged material would be disposed at an upland location, the practical alternatives to be evaluated would revolve around the selected dredging technique itself. The basic options are mechanical bucket dredging versus suction dredging. The relatively small area to be dredged, and the restricted confines of the harbor basin, would probably necessitate the use of a bucket dredge. A suction dredge may loft less sediment during sediment removal, but would generate a slurry of much higher water content that would then need to be managed and dewatered at the scow. It is not likely that the use of suction dredging would result in lesser impacts to water quality. The use of a closed-top bucket during dredging may result in less fallback and out-wash of sediment, and therefore, limit the impact on water quality.

C. Compliance with Applicable State Water Quality Standards: The discharge of the sediment during dredging and dewatering would not violate any applicable State water quality standards beyond a few meters of the discharge site. The fill operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

D. Compliance with Endangered Species Act of 1973: The proposed action would not harm any threatened or endangered species or their critical habitat.

E. Compliance with Specified Protection Measures for Marine Sanctuaries Designed by the Marine Protection Research and Sanctuaries Act of 1972: No action associated with the proposed project would violate the above Act.

F. Evaluation of Extent of Degradation of the Waters of the United States: There would be no significant adverse impacts to municipal and private water supplies, recreation and commercial fisheries, plankton, fish, shellfish, wildlife and/or aquatic sites caused by the proposed action. There would be no significant adverse effects on regional aquatic ecosystem diversity, productivity, and/or stability caused by the placement of the fill material nor would there be significant adverse effects on recreation, aesthetic, and/or economic values caused by this project.

G. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on Aquatic Ecosystems: All appropriate and practicable steps would be taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem. Those steps include timing of dredging and disposal activities to avoid species of concern, selecting the dredging method that results in the smallest amount of re-suspension, upland disposal in the Petersburg landfill, and incorporating best management practices and mitigation measures into the project design and construction contract.

IV. COORDINATION

On the basis of the Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR part 230), the proposed project has been specified as complying with the requirements of the guidelines for Section 404 of the Clean Water Act.

APPENDIX 2

Essential Fish Habitat Assessment

Petersburg Small Boat Harbor

Maintenance Dredging

Petersburg, Alaska

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ESSENTIAL FISH HABITAT ASSESSMENT

Petersburg North Harbor
Maintenance Dredging
Petersburg, Alaska

Preface

The 1996 amendments to the Magnuson-Stevens Fishery Conservation and Management Act set forth the essential fish habitat (EFH) provision to identify and protect important habitats of federally managed marine and anadromous fish species. Federal agencies that fund, permit, or undertake activities that may adversely affect EFH are required to consult with the National Marine Fisheries Service (NMFS) regarding the potential effects of their actions on EFH and respond in writing to NMFS recommendations.

EFH is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity. "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. "Substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities.

Upon completing the Corps' EFH-coordination with the NMFS, the Corps will incorporate its EFH evaluation and findings and NMFS conservation recommendations (if any) into the project's environmental assessment. As a result of recent work in the Sitka area by the Corps and the FAA, and due to the proximity of Petersburg to Sitka, some of the same EFH information was used and is reflected in this analysis.

Project Purpose

The U.S. Army Corps of Engineers (Corps) is proposing to dredge shoaled areas of the North Boat Harbor at Petersburg, Alaska. The purpose of the proposed dredging project is to restore design depths to allow for safe passage of vessels using the harbor. The harbor is shoaling in five areas with varying design depth requirements. A total of approximately 26,400 cubic yards of sediments are expected to be dredged with a clamshell dredge.

Project Authority

The Rivers and Harbors Act of 30 August 1935 (House Doc. 483, 72nd Congress, 2nd Session), the Rivers and Harbors Act of 2 March 1945 (House Doc. 670, 76th Congress, 3rd Session) as adopted, and the Rivers and Harbors Act of 2 September 1954 (House Doc. 501, 83rd Congress, 2nd Session) as adopted, gave the Corps authority for operations and maintenance dredging of the approaches to the harbor, and the North Harbor boat basin, at Petersburg, Alaska, as depicted

in the 2009 P&I Manual, pages 1-36 and 1-36a (figures 4 and 5). Maintenance dredging was last conducted between 1969 and 1971.

Project Area Description

Petersburg, Alaska and its harbor are located on the northwesterly tip of Mitkof Island at the intersection of Fredrick Sound and Wrangell Narrows. The nearest comparable ports are Ketchikan, Alaska, 116 miles to the southeast and Juneau, Alaska, 107 miles to the northwest (figure 1).

Construction of the original Petersburg Harbor facilities was first completed in 1937 (USACE 2009). The River and Harbor Act of March 2nd 1945 authorized enlargement of the harbor by dredging to -11 feet MLLW over approximately 135,000 square feet adjacent to and shoreward of the original authorized project limits (USACE 1977). In 1957 a shoreward excavation enlarged the basin and the outer one-third of the basin via dredging to -15 feet MLLW. Maintenance dredging has been required only once, in 1969, in the southern end of the basin. That action was concluded in 1971 with the removal of 2,000 cubic yards (cy) of silt (USACE 1977 & USACE 2009). To date, no additional Federal operations and maintenance dredging has occurred. Condition surveys of the harbor were conducted in 2000, 2003, and 2008. Vertical and oblique aerial photography was taken in 2005. Currently, shoaling is apparent around the vessel berths in the -15 to -11 foot MLLW areas. Shoaling is apparent along the entire southern portion of the project limits, with depths as shallow as -7.4 feet MLLW in the vessel berths (USACE 2009).

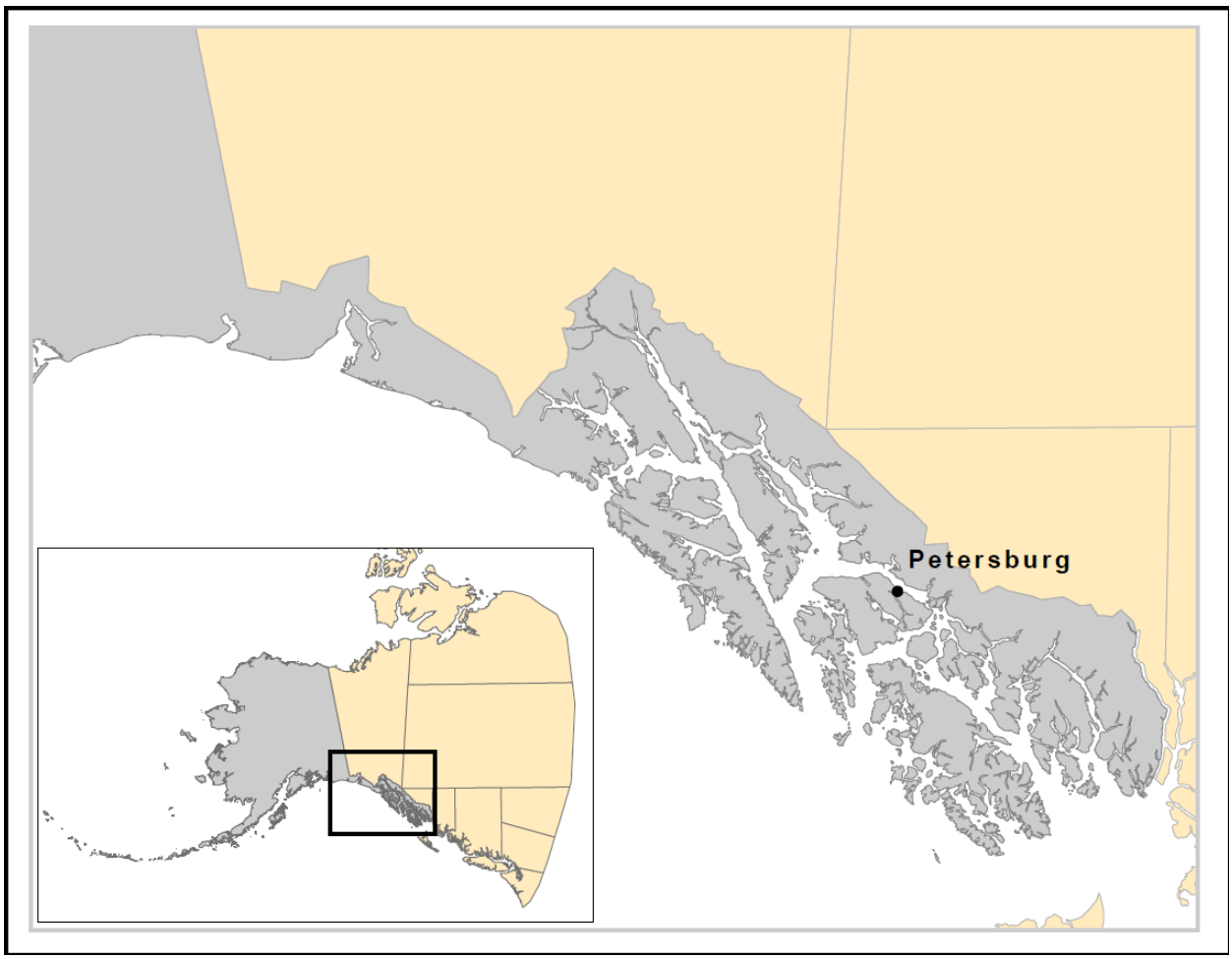

Figure 1. Petersburg location and vicinity map.

Construction of the original harbor dredged the approaches to the wharves to -24 feet MLLW, a small boat basin of approximately 5 acres to a depth of -11 feet MLLW, and a short channel 40 feet wide to -8 feet MLLW. The harbor is defined as an approximately mile-long expanse of water fronting Petersburg. The harbor is formed by a natural widening of the north end of the Wrangell Narrows and is characterized by a relatively flat tidal beach that slopes gradually from the high water line to mid channel. Accordingly, depths in the harbor area vary from zero to channel depths of 4 to 5 fathoms. Primary harbor facilities currently include a boat ramp, tidal grid, finger and float system, and adjacent private wharves that service Icicle, Ocean Beauty and Trident Seafoods canneries, and the Petersburg Harbormasters Office.

The primary source of sediments is Hammer Slough, which used to have its main channel through North Harbor. Currently, the city's small boat basin is in Middle Harbor, which abuts North Harbor to the southwest at the mouth of Hammer Slough, and therefore, acts as a sediment trap to catch sediments traveling down Hammer Slough toward different areas (figure 2) of the harbor (USACE 1977).

The following are the harbor areas to be dredged:

- Harbor Dredging Area 1: encompasses 5.83 acres and approximately 12,550 cy of material to achieve design depth.
- Harbor Dredging Area 2: encompasses 3.90 acres and approximately 3,350 cy of material to achieve design depth.
- Harbor Dredging Area 3: encompasses 0.82 acres and approximately 1,900 cy of material to achieve design depth.
- Harbor Dredging Area 4: encompasses 1.49 acres and approximately 7,200 cy of material to achieve design depth.
- Harbor Dredging Area 5: encompasses 0.20 acre and approximately 1,400 cy of material to achieve design depth.

The total surface acreage to be dredged is estimated at a little over 12 surface acres and an estimated 26,400 cy would be dredged to achieve the design depth. The type of dredge used would be a clamshell bucket positioned on a vertically mobile platform. The NEPA and related environmental analyses analyzes the effects of a dredging effort consisting of approximately 26,400 cy of dredged material.

Project Description

The U.S. Army Corps of Engineers (Corps) is proposing to dredge the North Boat harbor at Petersburg, Alaska. The harbor can be divided into five areas with varying design depth requirements: Area 1 to -11 feet MLLW, Area 2 to -14 feet MLLW, Area 3 to -24 feet MLLW, Area 4 to -24 feet MLLW, and Area 5 to -15 feet MLLW (figure 2). Approximately 26,400 cy of sediments is expected to be dredged via clamshell dredge after 1 foot of overdepth is dredged to achieve design depth. A transport barge would carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material would be offloaded into watertight trucks for transport to the Petersburg Landfill. The Federal action would conclude with initial disposal of the dredged material at the Petersburg Landfill. The City of Petersburg is accepting ownership of and responsibility for the dredged material after initial placement in the landfill. The city is coordinating development of a disposal plan with the Alaska Department of Environmental Conservation that would use the dredged material as a cap for an existing pile of metal at the landfill.

Essential Fish Habitat

NMFS authority to manage EFH is directly related to those species covered under Fishery Management Plans (FMPs) in the United States. The Corps' maintenance dredging action is within an area designated as EFH for two FMPs—Gulf of Alaska (GOA) Groundfish and Alaska Stocks of Pacific salmon. These two FMPs include species or species complexes of groundfish and invertebrate resources and all Pacific salmon species (table 1). See Appendix B for a

description of GOA Groundfish resources. No EFH "habitat areas of particular concern" are in the Corps' project area.[1]

Near-shore habitats in proximity to the harbor are expected to be used by juvenile salmonids during their early marine life history. According to the Alaska Department of Fish and Game, approximately six streams in the Petersburg area are used by Chinook, coho, pink, and sockeye salmon. Juvenile salmon from these streams may use the near-shore project area during their spring outmigration, feeding along marine shorelines, gaining size and swimming ability before moving into more offshore waters. Young-of-the-year (all fish less than 1 year old) coho and sockeye salmon may also be found along the shoreline.

Rocky and mixed-soft shorelines provide a prey base of gamma rid amphipods and harpacticoid copepods. Near-shore waters also harbor a myriad of predators on juvenile salmonids, including larger fish (e.g., rockfish and other salmonids), piscivorous birds (e.g., grebes, cormorants, herons), and marine mammals (seals, sea lions, and humpback whales). To avoid these predators, juvenile salmonids benefit from the presence of shoreline complexity (e.g., large wood, rocks, and kelp beds) that provide escape and hiding spaces. Offshore kelp beds in proximity to the harbor may provide an abundance of larval fish that are favored prey of juvenile pink and coho salmon. Both juvenile and adult salmon have been known to use kelp beds, but the association has not been well documented.

Larval, juvenile, and adult life stages of several rockfish species could occur in and in proximity to the Corps' project area.

[1] http://www.fakr.noaa.gov/habitat/efh/hapc/hapc_ak.pdf

Table 1. Fish with designated essential fish habitat in the Gulf of Alaska Groundfish and Alaska Stocks of Pacific Salmon Fishery Management Plan areas (FAA, 2009; Appendix 3).

Gulf of Alaska Ground Fish		**Alaska Stocks of Pacific Salmon**
Skates (Rajidae)	Shortraker rockfish	Chinook salmon
Pacific cod	Northern rockfish	Coho salmon
Walleye Pollock	Dusky rockfish	Pink salmon
Thornyheads	Yellowfin sole,	Chum salmon
Pacific ocean perch	Arrowtooth flounder	Sockeye salmon
Rougheye rockfish	Rock sole	
Yelloweye rockfish	Alaska plaice	
Rex sole	Sculpins (Cottidae)	
Dover sole	Sharks	
Flathead sole	Forage fish complex	
Sablefish	Squid	
Atka mackerel	Octopus	

Larval, juvenile, and adult life stages of several flatfish species are expected to occur on soft and mixed bottom habitats. EFH species of flatfish may be present in the project area, particularly common species such as yellowfin sole and rock sole.

Several taxa of EFH sculpin are expected to occur in both rocky and mixed bottom habitats in their project area. It is conceivable that all life stages of sculpin are likely present. EFH forage species such as eulachon, capelin, and Pacific sand lance could also occur as they are also known to be abundant in the Sitka area.

Pacific herring are not included in the Gulf of Alaska Groundfish FMP and hence are not an EFH species; however, they serve an important ecological role within Frederick Sound. Pacific herring provide an abundant, high energy food source for a wide variety of fishes, mammals, and birds. Herring are also commercially important and support a roe fishery in Southeast Alaska that remains one of the largest and most valuable roe fisheries in Alaska.

All stages of herring are found in the HPC and are central to the area's marine food web. The largest herring stock in Southeast Alaska migrates to Sitka Sound each spring for an annual spawning event, spanning several days to several weeks from mid-March to late-April. Based on ADFG surveys over the last 30 years, herring spawning areas have been highly variable, but observed on marine vegetation around the perimeter of the Sitka Airport. Herring spawn from the intertidal zone down to about −40 feet MLLW, targeting areas with substantial macroalgae concentrations. Egg deposition can occurs on all species of kelp as observed in the Sitka area, particularly *Macrocystis* and *Saccharina*, but herring also use eelgrass, *Fucus*, coralline algae, red algae, and hard rocky substrates.

Assessment of Project Effects on Essential Fish Habitat

The Corps' assessment of its project on EFH mirrors the approach and findings of FAA's Sitka Airport improvements EFH assessment (FAA, 2009), as the FAA project is adjacent to the Corps' project area in Sitka and includes similar features, such as fill placed in the marine near-shore environment and construction activities.

The types of impacts that would possibly affect EFH species/species complexes (five Pacific salmon species, the sculpin complex, and several species of flatfish, rockfish, and forage fish) known or highly likely to occur within the project area are separated into short-term and long-term impacts.

Short-term impacts include: (1) water quality impacts in the form of increased levels of turbidity resulting from fill and rock placement and oil/grease releases from work vessels and equipment; (2) noise disturbance from operation of heavy equipment, cranes, or barges; and (3) disturbance from increased construction-related work boat traffic in the project area and along supply routes.

No long-term impacts are expected.

Short-term Impacts

<u>Water Quality</u>

Any turbidity would be temporary, occur only in the immediate vicinity of clamshell dredging, and dissipate rapidly by tidal mixing.

Juvenile salmon have been shown to avoid areas of high turbidities (Servizi 1988), although they may seek out areas of moderate turbidity (10 to 80 NTU), presumably as refuge against predation (Cyrus and Blaber 1987a and 1987b). Feeding efficiency of juveniles is impaired by turbidities in excess of 70 NTU, well below sublethal stress levels (Bisson and Bilby 1982). Reduced preference by adult salmon homing to spawning areas has been demonstrated where turbidities exceed 30 NTU (20 mg/L suspended sediments). However, Chinook salmon exposed to 650 mg/L of suspended volcanic ash were still able to find their natal water (Whitman et al. 1982).

Based on these data, it is unlikely that short-term (measured in hours based on tidal exchange frequency) and localized elevated turbidities generated by the proposed action would directly affect EFH juvenile or adult salmonids and EFH groundfish, such as flatfish, sculpins, and rockfish that may be present. Potential impacts would be further minimized by conducting all in-water work within approved regulatory work windows that would avoid major periods of juvenile salmon outmigration.

Except for the short-term, localized turbidity associated with maintenance dredging, no adverse impacts to water or sediment quality is expected to occur as a result of the recommended dredging action.

Waterborne Noise

Waterborne noise would result from construction activities, such as the noise generated directly by work vessels (propulsion, power generators, on-board cranes, etc.) or by activities conducted by those vessels (e.g., clamshell dredging and placing material into the barge).

Underwater noise or sound pressure from construction activities can have a variety of impacts on marine biota, especially fish and marine mammals. The most adverse impacts are associated with activities like underwater explosions and impact pile driving that produce a sharp sound through the water column (Hastings and Popper, 2005). However, in-water activities associated with the Corps' recommended maintenance dredging (e.g., work vessel traffic and operation) do not have the potential to generate the type and intensity of sound pressures that would result in adverse impacts to fish. At levels of sound resulting from the work activities anticipated, the primary reaction of EFH fish species/species complexes is expected to be simply a movement away from the work area. These affects would be further minimized by restricting in-water work to periods when few juvenile salmonids are in the area. Groundfish species such as flatfish, rockfish, and sculpins can be present year-round, so they may move out of the area during the construction period as well.

Construction-related Work Boat Traffic

Constructing the Corps's proposed project would heavily involve clamshell dredging and the placement of materials onto a barge. For EFH fish, interactions with tug and barge traffic would be relatively benign, consisting of the animals simply moving away from the vessels as they transit back and forth. Vessels and barges would not be permitted to ground themselves on the bottom during low tide periods, thus no destruction or alteration of bottom habitats that constitute EFH for several pelagic and groundfish would occur.

Long-term Impacts

Loss and Conversion of Marine Habitat

No loss or conversion of marine habitat is expected as a result of the maintenance dredging activity. All material will be placed in the Petersburg landfill.

Water Quality

Except for the previously discussed short term, localized turbidity associated with the placement of breakwater material into the marine environment, no adverse impacts to water or sediment quality, EFH, and EFH-related species/species complexes are expected to occur as a result of the recommended maintenance dredging.

Mitigation Measures

"Mitigation" is the process used to avoid, minimize, and compensate for environmental consequences of an action. Incorporating the following mitigation measures and conservation measures into the recommended corrective action will help to ensure that no significant adverse impacts would occur to EFH and EFH-managed species/species complexes and other fish and wildlife resources in the project area.

- The proposed action shall cease in-water construction between March 15 and June 15 during peak herring spawning activities, juvenile salmon outmigration and rearing activities, and when Steller sea lion and humpback whale feeding and abundance is expected to be greatest in the project area.

- To minimize the danger to marine mammals from project-related vessels, speed limits (e.g. less than 8 knots) shall be imposed on vessels moving in and around the project area.

- Project-related vessels and barges shall not be permitted to ground themselves on the bottom during low tide periods, unless there is a human safety issue requiring it.

- A construction oil spill prevention plan shall be prepared.

- Project-related vessels shall not travel within 3,000 feet of designated Steller sea lion critical habitat (haulouts or rookeries).

- The Corps will conduct post-dredge bathymetry surveys to ensure that only the material identified to be dredged was removed to the authorized depth.

- A scow barge will be loaded so that enough of the freeboard remains to allow for safe movement of the barge and its material on the route to the offloading site to be identified.

Conclusions and Determination of Effect

The project actions described above have the potential to affect the EFH for several Gulf of Alaska groundfish species (e.g., rockfish, sculpin, and flatfish) and for Alaska stocks of Pacific salmon, in the short term. Short-term effects in the form of avoidance because of noise disturbances, boat traffic, and turbidity would be intermittent and low level. No long-term effects are expected.

The potential effects of turbidity would be intermittent and low level. No adverse impacts related to circulation and harbor-flushing is expected. Year-round resident EFH species such as rockfish, flatfish, and sculpins would likely respond by temporarily moving out of work areas during construction.

The Corps' recommended maintenance dredging would likely occur over a period of months and within an anticipated in-water work window. Seasonal work restrictions would minimize any impacts to out-migrating juvenile salmonids and to spawning herring by prohibiting work in open waters between approximately March 15 and June 15. Work would be allowed in marine waters from June 16 to March 14, to avoid herring spawning activities. The actual start and finish of the spring timing window may shift to accommodate earlier or later herring spawns.

Potential impacts to EFH and EFH-managed species/species complexes are likely to be highly localized, temporary, and minimal, and not reduce the overall value of EFH in Frederick Sound. The aforementioned mitigation measures will be implemented to offset the potential impacts of the Corps' maintenance dredging activity. Therefore, the Corps concludes that its Federal action may affect, but is not likely to adversely affect, EFH and EFH-managed species/species complexes for Gulf of Alaska groundfish and Alaska stocks of Pacific salmon.

References

Alaska Department of Fish and Game. 1998. Sitka Boat Harbor Herring Deposition Study, Final Report with 1997 and 1998 Survey results. Commercial Fisheries Management and Development Division, Juneau, Alaska. November. 37 pp.

Bisson, P.A. and R.E. Bilby, 1982. Avoidance of Suspended Sediment by Juvenile Coho Salmon. North American Journal of Fisheries Management, 4:371-374.

Carr, H., and E. Amaral, 1981. Review of the Potential for Artificial Reefs along Coastal Massachusetts. In Proc. Oceans '81, p. 765-769.

Cyrus, D.P. and S.J.M. Blaber, 1987a. The Influence of Turbidity on Juvenile Marine Fishes in Estuaries. Part 1: Field Studies at Lake St. Lucia on the Southeastern Coast of Africa. Journal of Experimental Marine Biology and Ecology, 109:53-70.

Cyrus, D.P. and S.J.M. Blaber, 1987b. The Influence of Turbidity on Juvenile Marine Fishes in Estuaries. Part 2: Laboratory Studies, Comparisons with Field Data and Conclusions. Journal of Experimental Marine Biology and Ecology, 109:71-91.

Federal Aviation Administration. 2009. Final Environmental Impact Statement. Sitka Rocky Gutierrez Airport, Sitka, Alaska. Anchorage, AK. May. http://www.sitkaeis.com/feis.htm

Hastings, M.C. and A.N. Popper, 2005. Effects of Sound on Fish. Prepared for the California Department of Transportation by Jones and Stokes, Sacramento, California.

Lewis, L., J. Davenport, and T. Kelly, 2002. A Study of the Impact of a Pipeline Construction on Estuarine Benthic Invertebrate Communities. Estuar. Coast. Shelf Sci. Vol. 55, no. 2, pp. 213-221.

NMFS, 2005a. Essential Fish Habitat Assessment Report for the Groundfish Resources of the Gulf of Alaska Region. Appendix F.1. NMFS, NMFS Alaska Region, Juneau, Alaska.

_____, 2005b. Essential Fish Habitat Assessment Report for the Salmon Fisheries in the EEZ off the Coast of Alaska. Appendix F.5. NMFS, NMFS Alaska Region, Juneau, Alaska.

Servizi, J.A., 1988. Sublethal Effects of Dredged Sediments on Juvenile Salmon. C.A. Simenstad, editor. Effects of Dredging on Anadromous Pacific Coast Fishes. University of Washington, Seattle, Washington.

Underwood, A., 2000. Experimental Ecology of Rocky Intertidal Habitats: What are We Learning? J. Exp. Mar. Biol. Ecol. Vol. 250, no. 1-2, pp. 51-76.

U.S. Fish and Wildlife Service. 2005. A Survey of Herring Spawning Habitat on the New Thompson Breakwaters, Sitka, Alaska. June 9-12, 2005. Juneau Field Office. for U.S. Army Corps of Engineers Alaska District. July. 29 pp.

_____. 1996. Report of Field Investigations for Sitka Breakwater Colonization and Herring Spawning Survey. Sitka, Alaska. Southeast Alaska Ecological Services, Juneau, Alaska. April. 5 pp.

Whitman, R.P., T.P. Quinn, and E.L. Brannon, 1982. Influence of Suspended Volcanic Ash on Homing Behavior of Adult Chinook Salmon. Transactions of the American Fisheries Society, 111:63-69.

APPENDIX A

Proposed Maintenance Dredging

The U.S. Army Corps of Engineers (Corps) is proposing to dredge the boat harbor at Petersburg, Alaska. The harbor can be divided into five areas with varying design depth requirements: Area 1 to -11 feet MLLW, Area 2 to -14 feet MLLW, Area 3 to -24 feet MLLW, Area 4 to -24 feet MLLW, and Area 5 to -15 feet MLLW (figure 1). A total of 26,400 cubic yards of sediments are expected to be dredged via clamshell dredge after 1 foot of overdepth is dredged to achieve design depth. A transport barge would carry the material to an existing ramp or off-loading facility in the northern portion of the harbor where the material would be offloaded into watertight trucks for transport to the Petersburg Landfill. The Federal action concludes with initial disposal of the dredged material at the Petersburg Landfill. The City of Petersburg is accepting ownership of and responsibility for the dredged material after initial placement in the landfill. The city is coordinating development of a disposal plan with the Alaska Department of Environmental Conservation that would use the dredged material as a cap for an existing pile of metal at the landfill.

Table 1.Dredge quantities based on 2011 survey

Area	Estimated Quantity (2011)	Notes
Area 1 **-15 Project Dept** **-16 Max pay**	**12,550 cy**	**Harbor Basin**
Area 2 **-11 Project Depth** **-12 Max Pay**	**3,350 cy**	**Harbor Basin**
Area 3 **-24 Project Depth** **-25 Max Pay**	**1,900 cy**	**South Dock (Ocean Beauty)**
Area 4 **-24 Project Depth** **-25 Max Pay**	**7,200 cy**	**North Dock – to dock face** **(Icicle Sea foods)**
Area 5 (New) **-15 Project Depth** **-16 Max Pay**	**1,400 cy**	**North Dock – Between Docks** **(Icicle Sea foods)**
Total	**26,400 CY**	

It should be noted that it is not practical or possible to determine the exact amount of material to be removed. Shoals accrete and erode as harbor conditions change. Dredged material estimates are made based on pre-dredging hydrographic survey data. Dredging contract payments for material removed are based on post-dredging hydrographic surveys.

The Corps of Engineers Regulations Manual on Navigation and Dredging Operations and Maintenance ER 1130-2-520 states that:

> "It is the policy of the Corps of Engineers that dredging shall be accomplished in an efficient, cost-effective, and environmentally acceptable manner to improve and maintain the Nation's waterways and make them suitable for navigation and other purposes consistent with Federal laws and regulations."

And that:

> "The maximum practical benefits will be obtained from materials dredged from authorized Federal navigation projects, after taking into consideration economics, engineering, and environmental requirements in accordance with applicable Federal laws and regulations (33 CFR Parts 335-338)."

Based on these regulations and the available dredging and material placement options that meet the constraints of the type of material found in the harbor, the Corps is proposing to dredge with a clamshell dredge and the Corps further proposes upland placement of the material at the previously indentified landfill at Petersburg. Material will be removed by mechanical dredging of North Harbor via a barge mounted crane with a clamshell bucket, deposited into a scow, transported to an existing ramp or off-loading facility, off-loaded into water-tight trucks, and transported to, and disposed of in the Petersburg Landfill, with boulders disposed of above MHHW at Scow Bay. Dredging will occur in compliance with all terms of the Water Quality Certificate and will take place between 15 March and 15 June in accordance with the in-water work windows for this operation. Any exceptions to these agreements will require the concurrence of the appropriate regulating agency. This dredging method and placement option takes into consideration the required economic, engineering, and environmental requirements. Because this alternative minimized negative water quality impacts (in relation to hydraulic dredging) and resulted in the contaminated materials being disposed of in the least environmentally negative location known, it was carried forward for detailed analysis.

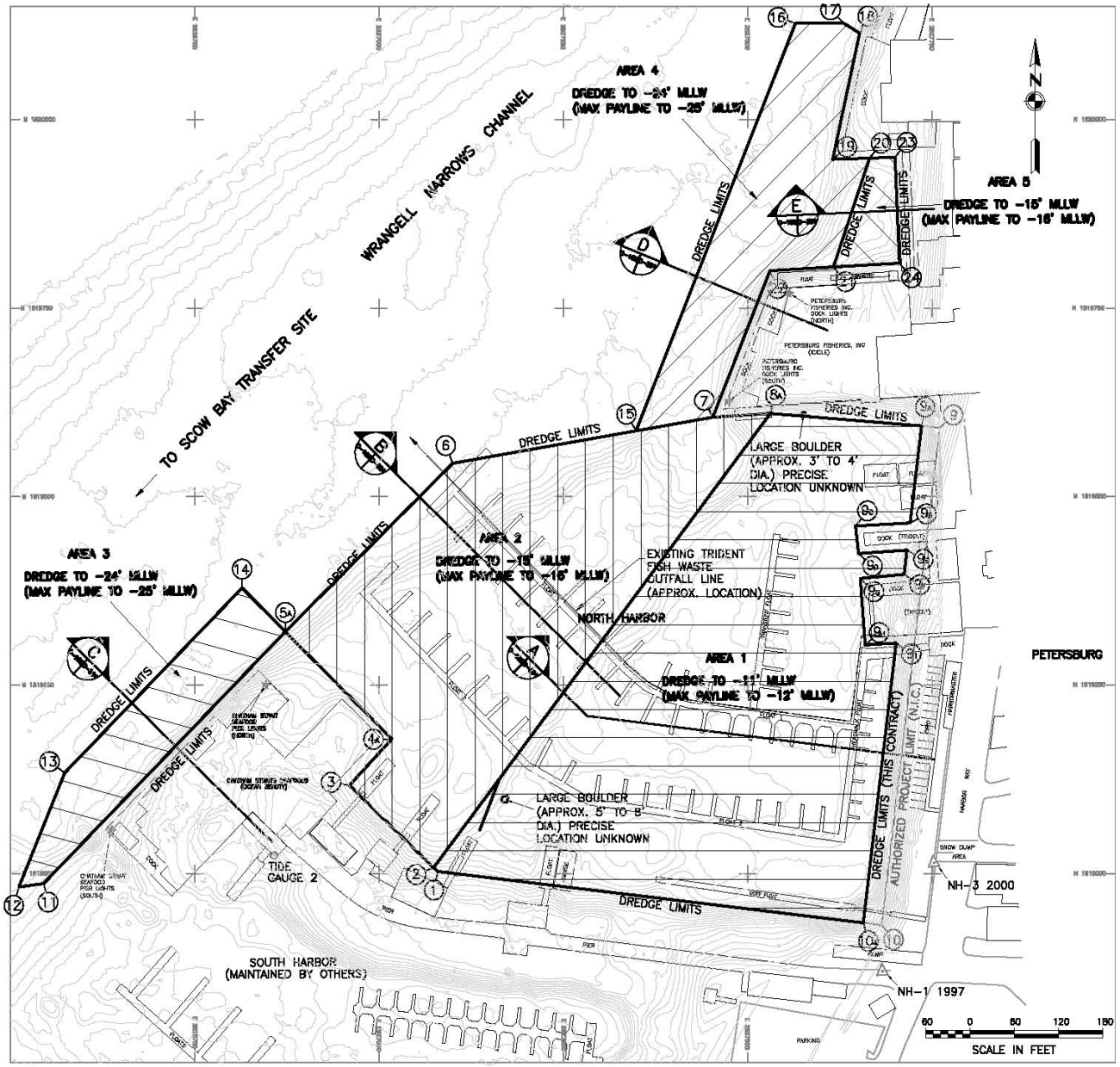

Figure 1. Petersburg Harbor areas requiring maintenance dredging.

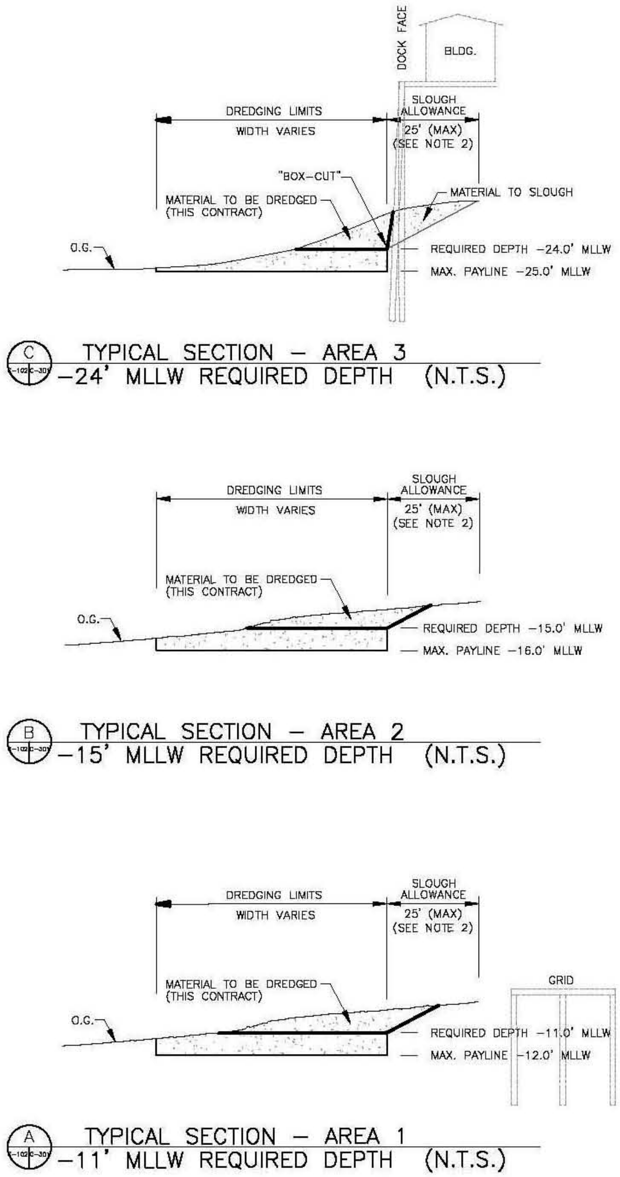

Figure 2. Typical sections for the areas to be dredged.

APPENDIX B

Description of Essential Fish Habitat for the Groundfish Resources of the Gulf of Alaska Region[2]

Walleye Pollock

Eggs
EFH for walleye pollock eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters), upper slope (200 to 500 meters), and intermediate slope (500 to 1,000 meters) throughout the GOA.

Larvae
EFH for larval walleye pollock is the general distribution area for this life stage, located in epipelagic waters along the entire shelf (0 to 200 meters), upper slope (200 to 500 meters), and intermediate slope (500 to 1,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Limited information exists to describe walleye pollock early juvenile larval general distribution.

Late Juveniles
EFH for late juvenile walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA. No known preference for substrates exists.

Adults
EFH for adult walleye pollock is the general distribution area for this life stage, located in the lower and middle portion of the water column along the entire shelf (0 to 200 meters) and slope (200 to 1,000 meters) throughout the GOA. No known preference for substrates exists.

Pacific Cod

Eggs
EFH for Pacific cod eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper (200 to 500 meters) slope throughout the GOA wherever there are soft substrates consisting of mud and sand.

[2] http://sharpfin.nmfs.noaa.gov/website/efh_mapper/newinv/efh_inventory.html

Larvae
EFH for larval Pacific cod is the general distribution area for this life stage, located in pelagic waters along the inner (0 to 50 meters) and middle (50 to 100 meters) shelf throughout the GOA wherever there are soft substrates consisting of mud and sand.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the BSAI wherever there are soft substrates consisting of sand, mud, sandy mud, and muddy sand.

Adults
EFH for adult Pacific cod is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are soft substrates consisting of sand, mud, sandy mud, muddy sand, and gravel.

Yellowfin Sole

Eggs
EFH for yellowfin sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper (200 to 500 meters) slope throughout the GOA.

Larvae
EFH for larval yellowfin sole is the general distribution area for this life stage, located in pelagic waters along the shelf (0 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within near-shore bays and along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand.

Adults
EFH for adult yellowfin sole is the general distribution area for this life stage, located in the lower portion of the water column within near-shore bays and along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are soft substrates consisting mainly of sand.

Arrowtooth Flounder

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval arrowtooth flounder is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf and upper slope (200 to 500 meters) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud.

Adults
EFH for adult arrowtooth flounder is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf and upper slope (200 to 500 meters) throughout the GOA wherever there are softer substrates consisting of gravel, sand, and mud.

Rock Sole

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval rock sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper slope (200 to 1,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble.

Adults
EFH for adult rock sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the BSAI wherever there are softer substrates consisting of sand, gravel, and cobble.

Alaska Plaice

Eggs
EFH for Alaska plaice eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA in the spring.

Larvae
EFH for larval Alaska plaice is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Adults
EFH for adult Alaska plaice is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the BSAI wherever there are softer substrates consisting of sand and mud.

Rex Sole

Eggs
EFH for rex sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA in the spring.

Larvae
EFH for larval rex sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud.

Adults
EFH for adult rex sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are substrates consisting of gravel, sand, and mud.

Dover Sole

Eggs
EFH for Dover sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Larvae
EFH for larval Dover sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 meters), and outer (100 to 200 meters) shelf and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates consisting of sand and mud.

Adults
EFH for adult Dover sole is the general distribution area for this life stage, located in the lower portion of the water column along the middle (50 to 100 meters), and outer (100 to 200 meters) shelf and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates consisting of sand and mud.

Flathead Sole

Eggs
EFH for flathead sole eggs is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Larvae
EFH for larval flathead sole is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for juvenile flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud.

Adults
EFH for adult flathead sole is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (100 to 200 meters) shelf throughout the GOA wherever there are softer substrates consisting of sand and mud.

Sablefish

Eggs
EFH for sablefish eggs is the general distribution area for this life stage, located in deeper waters along the slope (200 to 3,000 meters) throughout the GOA.

Larvae
EFH for larval sablefish is the general distribution area for this life stage, located in epipelagic waters along the middle shelf (50 to 100 meters), outer shelf (100 to 200 meters), and slope (200 to 3,000 meters) throughout the GOA..

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 meters) throughout the GOA.

Adults
EFH for adult sablefish is the general distribution area for this life stage, located in the lower portion of the water column, varied habitats, generally softer substrates, and deep shelf gulleys along the slope (200 to 1,000 meters) throughout the GOA.

Pacific Ocean Perch

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval Pacific Ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (0 to 50 meters), middle shelf (50 to 100 meters), outer shelf (100 to 200 meters), and upper slope (200 to 500 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Pacific Ocean perch is the general distribution area for this life stage, located in the middle to lower portion of the water column along the inner shelf (0 to 50 meters), middle shelf (50 to 100 meters), outer shelf (100 to 200 meters), and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand.

Adults
EFH for adult Pacific Ocean perch is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates consisting of cobble, gravel, mud, sandy mud, or muddy sand.

Shortraker and Rougheye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval shortraker and rougheye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult shortraker and rougheye rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the outer shelf (100 to 200 meters) and upper slope (200 to 500 meters) regions throughout the GOA wherever there are substrates consisting of mud, sand, sandy mud, muddy sand, rock, cobble, and gravel.

Northern Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval northern rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult northern rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer slope (100 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates of cobble and rock.

Thornyhead Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval thornyhead rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 meters) and upper to lower slope (200 to 1,000 meters) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel.

Adults
EFH for adult Thornyhead rockfish is the general distribution area for this life stage, located in the lower portion of the water column along the middle and outer shelf (50 to 200 meters) and upper to lower slope (200 to 1,000 meters) throughout the GOA wherever there are substrates of mud, sand, rock, sandy mud, muddy sand, cobble, and gravel.

Yelloweye Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval yelloweye rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for late juvenile Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner (0 to 50 meters), middle (50 to 100 meters), and outer shelf (100 to 200 meters) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges.

Adults
EFH for adult Yelloweye rockfish is the general distribution area for this life stage, located in the lower portion of the water column within bays and island passages and along the inner shelf (0 to 50 meters), middle shelf (50 to 100 meters), outer shelf (100 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates of rock and in areas of vertical relief, such as crevices, overhangs, vertical walls, coral, and larger sponges.

Dusky Rockfish

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval dusky rockfish is the general distribution area for this life stage, located in pelagic waters along the entire shelf (0 to 200 meters) and slope (200 to 3,000 meters) throughout the GOA.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Dusky rockfish is the general distribution area for this life stage, located in the middle and lower portions of the water column along the outer shelf (100 to 200 meters) and upper slope (200 to 500 meters) throughout the GOA wherever there are substrates of cobble, rock, and gravel.

Atka Mackerel

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae
EFH for larval Atka mackerel is the general distribution area for this life stage, located in epipelagic waters along the shelf (0 to 200 meters), upper slope (200 to 500 meters), and intermediate slope (500 to 1,000 meters) throughout the GOA.

Early Juveniles —No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult Atka mackerel is the general distribution area for this life stage, located in the entire water column, from sea surface to the sea floor, along the inner (0 to 50 meters), middle (50 to 100 meters), and outer shelf (100 to 200 meters) throughout the GOA wherever there are substrates of gravel and rock and in vegetated areas of kelp

Sculpins

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Juveniles
EFH for juvenile sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), outer shelf (100 to 200 meters) and portions of the upper slope (200 to 500 meters) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud.

Adults
EFH for adult sculpins is the general distribution area for this life stage, located in the lower portion of the water column along the inner (0 to 50 meters), middle (50 to 100 meters), outer shelf (100 to 200 meters) and portions of the upper slope (200 to 500 meters) throughout the GOA wherever there are substrates of rock, sand, mud, cobble, and sandy mud.

Skates

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults
EFH for adult skates is the general distribution area for this life stage, located in the lower portion of the water column on the shelf (0 to 200 meters) and the upper slope (200 to 500 meters) throughout the GOA wherever there are of substrates of mud, sand, gravel, and rock.

Sharks

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults—No EFH Description Determined
Insufficient information is available.

Forage Fish Complex—Eulachon, Capelin, Sand Lance, Sand Fish, Euphausiids, Myctophids, Pholids, Gonostomatids, etc.

Eggs—No EFH Description Determined
Insufficient information is available.

Larvae—No EFH Description Determined
Insufficient information is available.

Early Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.

Squid

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles
EFH for older juvenile squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (200 to 500 meters) shelf and the entire slope (500 to 1,000 meters) throughout the GOA.

Adults
EFH for adult squid is the general distribution area for this life stage, located in the entire water column, from the sea surface to sea floor, along the inner (0 to 50 meters), middle (50 to 100 meters), and outer (200 to 500 meters) shelf and the entire slope (500 to 1,000 meters) throughout the GOA.

Octopus

Eggs—No EFH Description Determined
Insufficient information is available.

Young Juveniles—No EFH Description Determined
Insufficient information is available.

Late Juveniles—No EFH Description Determined
Insufficient information is available.

Adults. No EFH Description Determined
Insufficient information is available.