ESSENTIAL FISH HABITAT ASSESSMENT

NAVIGATION IMPROVEMENTS
CRAIG, ALASKA

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December 2014

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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 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's 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.

Project Purpose

The purpose of the proposed action is to construct additional protected vessel moorage space at Craig, Alaska.

Project Authority

The feasibility study for this project was conducted under authority granted by a resolution adopted on December 2, 1970, by the Committee on Public Works of the U.S. House of Representatives, under House Document No. 414, 83rd Congress, 2nd Session.

Project Area Description

The project area is in the near-shore marine environment at the northwest corner of Craig Island (roughly, 55.48°N, 133.16°W), adjacent to the community of Craig, Alaska, and the disused Wards Cover cannery site (figure 1).

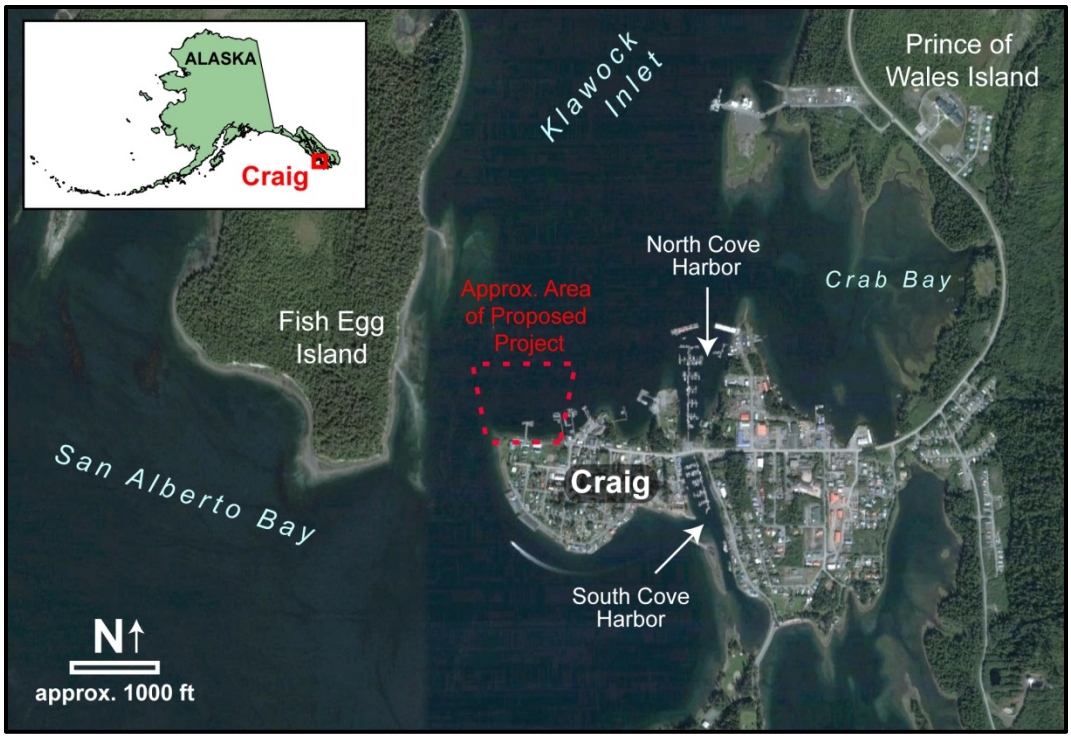

Figure 1. Project site location

Marine substrates and habitats in the waters off Craig Island range from rock, to coarse gravel and cobbles, to sand and mud, reflecting the degree of protection from ocean waves . The southwest and west shoreline is more exposed to swells sweeping up Bucareli Bay from the open ocean, and is more likely to consist of gravel and cobbles. More protected waters, such as the project site in partially enclosed Klawock Inlet, have finer sand and mud substrates. Eelgrass (*Zostera marina*) is found throughout the waters offshore of Craig wherever a suitable substrate (generally fine material such as silt or sand) and adequate sunlight allow it to grow; narrow bed of eelgrass runs through the project area parallel to the north shore of Craig Island. Large kelp species dominate the more rocky or cobble-surfaced seabed along the west and south shore of Craig Island.

An underwater video survey performed by the Corps in April 2014 obtained images along two transects running from near the north shoreline to roughly 700 feet off shore (figure 2). A narrow band of eelgrass was found running parallel to shore just below mean lower low water (MLLW). The eelgrass transitioned abruptly to a dense bed of short-stiped, broad-bladed kelp (thought to be *Saccharina latissima*, commonly known as sugar kelp). The kelp formed an uninterrupted carpet on the seafloor for a few hundred feet. At roughly 450 feet from shore, the brown algae became discontinuous and bottom sediment of sand and shell fragments became visible. As the transect moved further offshore, the algae gradually became more sparse, although algae were still visible when the transect ended about 700 feet from shore in waters approximately 45 feet in depth.

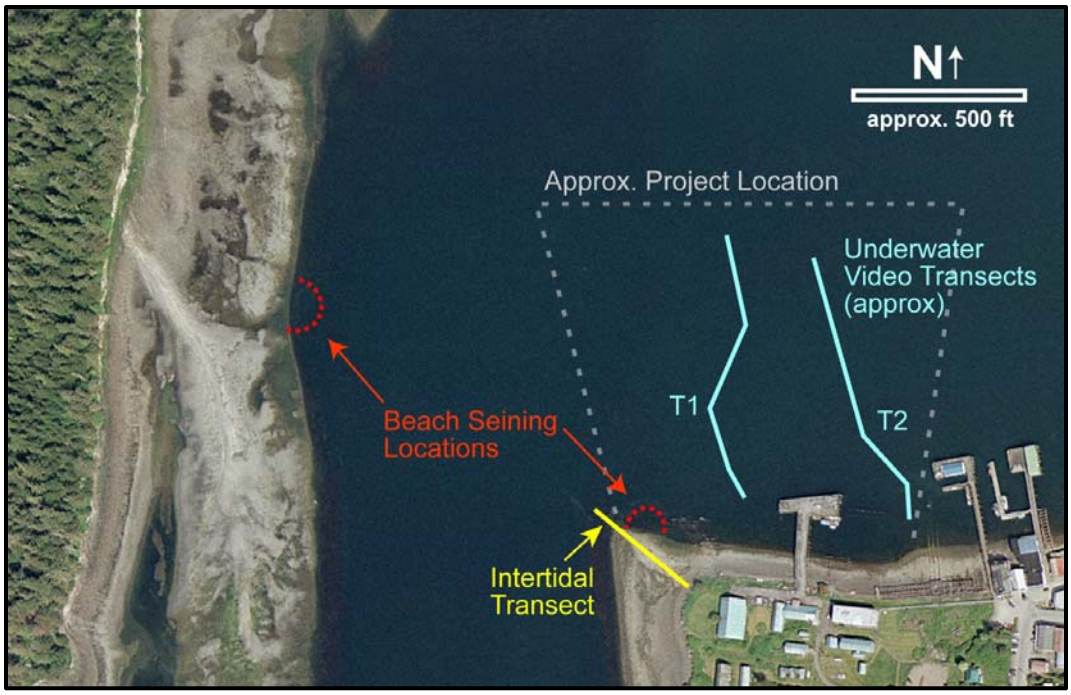

Figure 2. April 2014 study areas

The April 2014 underwater video survey was not able to confirm the western extent of eelgrass present within the project area. However, observations of site conditions suggest that the western extent of the eelgrass bed is similar what was found by the 1998 survey. A reef extends from the northwestern point toward the channel between Craig and Fish Egg Islands. The reef is vegetated with large kelp, (likely *Macrocystis pyrifera*). The heavy growth of kelp indicates very coarse sediment exists along the reef, which would not be suitable substrate for eelgrass. On 16 April 2014 Corps personnel and the City of Craig Harbormaster used a beach seine to capture and examine near-shore fish at two locations in or near the project location. The seine was 37 meters long and composed of tapering panels with mesh sizes ranging from 32mm in the outer panels to 3.2mm at the center. The net was deployed by holding one end on shore while using a skiff to unfurl the net out away from the beach, then bring the other end back to shore about 60 feet away from the starting point. The two ends of the seine were then carefully hauled in to shore, trapping fish and other organisms within the net. The captured fish and other organisms were quickly transferred to aerated buckets of seawater for examination.

The existing pilings and debris within the project area greatly limited the locations within the project area where the seine could be utilized. Therefore, the two locations utilized were the northwest point of Craig Island and the eastern shore of Fish Egg Island. The habitat at the Craig Island location was a mix of eelgrass and small brown algae. The Fish Egg Island location was predominantly eelgrass. The results of this effort are shown in table 1.

Table 1: Results of Beach Seining

NW Point of Craig Island – Species	**Number and Size Range Caught**
Kelp perch	4 (67-116 mm)
Tubesnout	5 (123-154 mm)
Pipefish	3 (130-289 mm)
Pink salmon, juvenile	6 (28-42 mm)
Chum salmon, juvenile	1 (45 mm)
Pinpoint Gunnel	1 (310 mm)
Sculpin sp.	6 (17-69 mm)
Hair Crab	3 (17-80 mm)
Unidentified crab	1 (8 mm)
Shrimp (Mysid)	~ 100 (~10-25 mm)
Amphipod	numerous
Fish Egg Island Location – Species	
Pink salmon, juvenile	1 (35 mm)
Chum salmon, juvenile	2 (40-42 mm)
Tubesnout	5 (125-254 mm)
Silverspot sculpin	4 (22-110 mm)
Shrimp (Mysid)	numerous (~10-25 mm)

The seine snagged on a rock at Fish Egg Island, delaying the collection of the captured fish and may have resulted in a lower catch. The species collected at the Craig Island site reflected its mixed-habitat with kelp-associated species such as Kelp Perch collected in similar numbers as eelgrass-associated species such as tubesnout and pipefish.

Figure 3: Kelp Perch (left) and Pipefish (right) caught at the project site

A larger-scale beach seining study was performed in 2000 by NMFS fishery biologists working from several locations in Klawock Inlet. The seine hauls for that study captured many of the same species seen at the project site in 2014 but yielded greater numbers and diversity of species

than those caught at the project site. Species caught during those efforts included juvenile rockfish and flatfish. The NMFS study compared seine catches at sites with eelgrass versus sites with kelp or filamentous algae and conluded that eelgrass and kelp habitats were both important habitat with comparable species richness, but appeared to host fish at different life stages. The youngest salmon and rockfish juveniles appeared to prefer eelgrass but larger juveniles moved into deeper waters and other habitats such as kelp forests. The study concluded it is possible that very young juvenile fish prefer eelgrass because of lower currents and wave action rather than the eelgrass itself.

No herring were caught in the April 2014 seining study. There is a notable herring spawn in the Craig area, generally between mid-March and mid-May, on rockweed, eelgrass and kelp in the intertidal and subtidal zones between +12 feet and -30 feet MLLW. Spawning areas surround Cemetery Island along the west side of Craig Island, in Crab Bay, and on the seaward shore of Fish Egg Island. Adult herring form large winter concentrations in certain bays. ADFG biologist Scott Walker stated that herring seem to avoid the developed northern shore of Craig Island but spawn in the kelp beds on the western shore immediately to the south of the project area.

Herring spawning occurs on rockweed, eelgrass and kelp in the intertidal and subtidal zones between +12 feet and -30 feet MLLW. Spawning areas surround Cemetery Island along the west side of Craig Island, in Crab Bay, and on the seaward shore of Fish Egg Island. Adult herring form large winter concentrations in certain bays. Concentrations are known to occur in the entrance to Trocadero Bay but smaller concentrations also occur in the aforementioned spawning areas. Winter bait fish are caught off the shoreline of Fish Egg Island (City of Craig 2006a). ADFG biologist Scott Walker stated that herring seem to avoid the developed northern shore of Craig Island but spawn in the kelp beds on the western shore immediately to the south of the project area (Walker 2014; City of Craig 2006).

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 proposed navigation improvement project is within an area designated as EFH for all five species of Pacific salmon, in all their life stages (NMFS 2014):

- Chinook salmon
- Coho salmon
- Pink salmon
- Chum salmon
- Sockeye Salmon

See Appendix B for a description of essential habitat for Pacific salmon. No EFH “habitat areas of particular concern” are in the Corps’ project area.

Assessment of Project Effects on Essential Fish Habitat

Short-term impacts include water quality impacts in the form of increased levels of turbidity, noise from construction operations, pollution in the form of fuel or oils spilled from the dredging equipment, noise from the construction equipment, and disturbance from the movement of equipment through the area.

Short-term Impacts

Water Quality. During the removal of the existing piles and construction of the new breakwater, there is likely to be a temporary increased concentration of suspended sediment within the water column. Placement of the breakwater's base rock will loft sediment into the water column and residual fines on the surface of core and armor rock will also contribute to temporary localized increases in turbidity. However, given the poor condition of the existing piles, it is possible that they could simply be cut or broken at the seabed rather than being extracted. This could reduce the amount of sediment disturbed during removal. Since the existing pilings are located in an area assumed to contain contaminated sediments, minimization of sediment disturbance during demolition is a significant consideration.

Certain types of high-sulfide rock found on Prince of Wales Island have been found to leach potentially damaging concentrations of acid when crushed and incorporated into structures such as road beds. The exact source of rock to be used for the Craig harbor breakwaters has not yet been selected, but the most likely sources are quarries producing limestone or greywacke, materials which would not be expected to generate acid. The final selection of the rock source will take into account the type of rock and its potential to generate acid leachate, and mineral types with a potential to generate acid will be avoided.

Pollution. Fuel and lubricants on the construction vessels are potential sources of spills into the marine environment. The contractor would be required to prepare a spill prevention and response plan and have appropriate spill response materials at the work site.

Waterborne Noise. Fish may be affected and displaced by noise from construction vessels and the placement of rock for the breakwaters. No blasting or pile-driving is anticipated as part of the Federal project, so injurious high-amplitude underwater noise should not result from construction. The placement of rock in the water for the creation of the breakwaters would generate relatively low-amplitude underwater noise likely to cause fish to temporarily move away from the construction site. The noise generated by barges and tugs in transit to and from the work area would be similar to that generated by routine small vessel traffic in the shipping lanes.

Construction-Related Vessel Traffic. The project site is adjacent to an existing busy waterfront area; the construction vessel and barge traffic related to the project would be similar to and an incremental increase over existing vessel traffic.

Long-Term Impacts

Loss and Conversion of Marine Habitat. The installation of the breakwaters would eliminate approximately 8 acres of existing submerged habitat consisting of a combination deep-water benthic communities and shallower kelp beds. The placement of the breakwaters would avoid to the extent practicable the narrow band of eelgrass that runs parallel to shore through the project area; the narrow, sparse bed of eelgrass in the project area is not thought to contribute significantly to salmon EFH. The breakwaters would permanently replace existing habitat with rocky substrate extending from the seabed to the surface, introducing structure and vertical relief that does not currently exist in the project area. The breakwaters can be expected to rapidly colonize with marine algae and invertebrate organisms characteristic of rocky intertidal and subtidal habitats, and with different communities than currently exist at the site. These organisms would include stalked marine algae such as *Fucus* and kelps, barnacles, mussels, anemones, and sea stars. The growth of sessile organisms on the breakwater surface would provide food and cover for shrimp and fish. Based on studies of rubblemound breakwaters installed in a similar setting near Sitka, Alaska (Brockmann and Grossman 2005), the revegetated breakwaters at Craig can be expected to offer habitat for fish such as Pacific herring superior to what currently exists at the project site.

The project area does not contain salmon spawning habitat, and has limited value as juvenile fish rearing habitat. It is most likely to be used by salmon as a migration corridor to and from Crab Creek and other anadromous streams in the region, and its shallow near-shore waters may serve as protection from predators. Fish passage in the near-shore environment is an important consideration. The proposed breakwater has the potential to negatively affect salmon movement through the near-shore environment, by diverting salmon into deeper water and lengthening the travel distance to migrate through the area. The preferred alternative includes a fish-passage gap in the breakwater to minimize the project impact on fish movements. The fish-passage was designed using input from the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and the National Marine Fisheries Service (Brockman 2014).

Water Quality. The new small boat harbor will substantially increase the vessel moorage capacity along the Craig waterfront, with the increased risk of fuel spills and long-term environmental degradation that goes with such development.

Avoidance and Minimization of Impacts. Planned measures to limit the project's impact on fish habitat include:

- The project will not include dredging of the harbor basin, in order to preserve the eelgrass beds present within the project area, and to avoid disturbing contaminated sediments.

- The breakwater design will incorporate fish passage to limit the affects of the breakwater on near-shore fish movements.

- To the extent practicable, work below the high tide line will be limited to low tidal stages to reduce turbidity.

- Project vessels will be limited to a speed of 8 knots to reduce the risk of collisions with protected species.

- In-water work between March 15 and June 15 will be avoided. This period coincides with the peak herring spawn and juvenile salmon out-migration activities, when humpback whales and other marine mammals are most likely to be in the project area.

- The selected contractor will include an Oil Spill Prevention and Control Plan in its Environmental Protection Plan, which is submitted to the Corps for review and approval.

Conclusions and Determination of Effect.

The major impact to EFH from the proposed project would be the breakwater's potential to restrict the movement of marine juvenile and adult salmon through the near-shore environment. The inclusion of effective fish passage in the breakwater would substantially diminish this impact. The rock structure of the breakwater is expected to colonize with marine algae within several years of installation, and provide potentially valuable feeding habitat and cover for juvenile salmon in an area where little currently exists.

References.

City of Craig. 2006a. Craig Coastal Management Program. April 2006.

Brockman, Steve, and Grossman, Ed. 2005. A Survey of Herring Spawning Habitat on the New Thompson Harbor Breakwaters, Sitka, Alaska, prepared by U.S. Fish and Wildlife Service, Juneau Office, Southeast Alaska, for U.S. Army Corps of Engineers Alaska District. June 9-12 2005.

Brockman, Steve (USFWS). 2014. Email communication dated 16 Oct 2014, subject: Craig Nav Improvements - fish passage maximum depth and distance?

National Marine Fisheries Service (NMFS). 2013. Alaska Region Essential Fish Habitat (EFH) website, http://www.fakr.noaa.gov/habitat/efh.htm

Walker, Scott (ADFG). Email communication dated 30 May 2014, subject: Craig navigation improvements and essential fish habitat.

Attachment A
Description of Navigation Improvements
Craig, Alaska

The intent of this project is to provide additional protected moorage space for vessels at Craig, where demand for moorage for commercial, subsistence, and recreational vessels exceeds the current supply. The six construction alternatives discussed in the FR/EA are all placed at the same location, and use rubblemound breakwaters of differing configurations to define harbor basins of 7.5, 10.1, 25.1, or 42.5 acres to accommodate different fleet sizes. All of the alternatives avoid the need for dredging, by positioning the mooring basin in sufficiently deep water. Alternative 2b (figure A-1) is the Tentatively Selected Plan. This alternative would require placement of 279,050 cubic yards of rock into the marine environment to create 1,933 combined linear feet of rubblemound breakwater with a footprint of 10.1 acres.

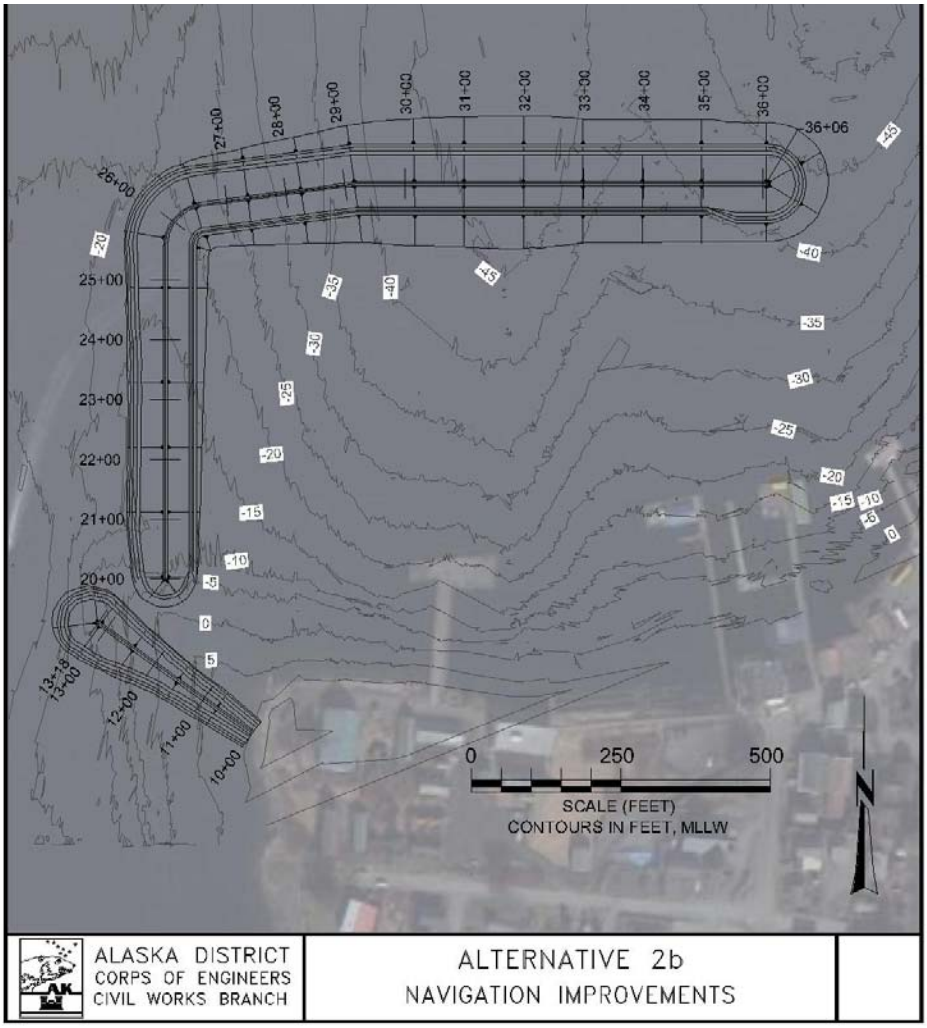

Figure A-1. Layout of Alternative 2b, the Tentatively Selected Plan.

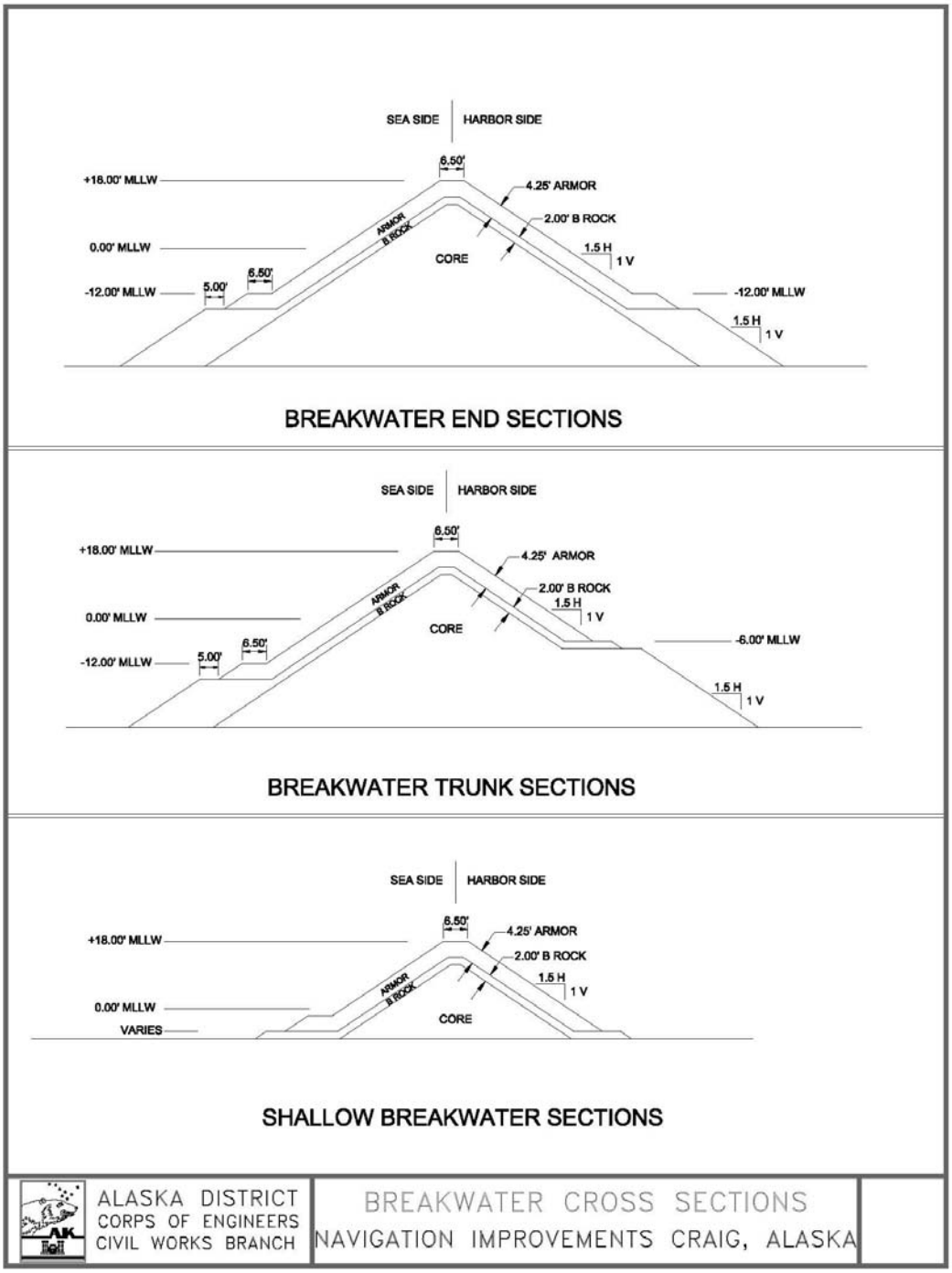

Figure A-2. Typical breakwater cross sections.

Alternative 2b includes a fish-passage gap in the breakwater to minimize the project impact on fish movements. The fish-passage was designed using input from the U.S. Fish and Wildlife Service, Alaska Department of Fish and Game, and the National Marine Fisheries Service.

The project location is offshore of the former Wards Cove cannery. The existing pier, dock, boatway, and numerous pilings would be removed prior to construction, as well as substantial debris from the intertidal and subtidal zones. Rock for the breakwater would be obtained from local established quarries, and brought to the project size by barge.

Figure 2. 2012 aerial view of the proposed project site (view is from the north).

Attachment B

Descriptions of Essential Fish Habitat
in the vicinity of Craig, Alaska

Alaska Stocks of Pacific Salmon

Pink Salmon

Freshwater Eggs
EFH for pink salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles
EFH for larval and juvenile pink salmon is the general distribution area for this life stage, located in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water during the spring, generally migrate in darkness in the upper water column. Fry leave streams in within 15 days and the duration of migration from a stream towards sea may last 2 months.

Estuarine Juveniles
Estuarine EFH for juvenile pink salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within near-shore waters and generally present from late April through June.

Marine Juveniles
Marine EFH for juvenile pink salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nautical-mile (nm) limit of the U.S. Exclusive Economic Zone (EEO), including the Gulf of Alaska (GOA), Eastern Bering Sea (EBS), Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults
EFH for immature and maturing adult pink salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Mature adult pink salmon frequently spawn in intertidal areas and are known to associate with smaller coastal streams.

Freshwater Adults
EFH for pink salmon is the general distribution area for this life stage, located in freshwaters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration*

of Anadromous Fishes and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm-diameter), 15 to 50 cm in depth from June through September.

Chum Salmon

Freshwater Eggs

EFH for chum salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*.

Freshwater Larvae and Juveniles

EFH for larval and juvenile chum salmon is the general distribution area for this life stage, located in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water and contiguous rearing areas within the boundaries of ordinary high water during the spring. Juveniles generally migrate in darkness in the upper water column. Fry leave streams within 15 days and the duration of migration from a stream towards sea may last 2 months

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Estuarine Juveniles

Estuarine EFH for juvenile chum salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within near-shore waters from late April through June.

Marine Juveniles

Marine EFH for juvenile chum salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to approximately 50 m in depth from the mean higher tide line to the 200-nm limit of the EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults

EFH for immature and maturing adult chum salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and ranging from the mean higher tide line to the 200-nm limit of the EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults

EFH for chum salmon is the general distribution area for this life stage, located in freshwaters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diameter); finer substrates can be used in upwelling areas of streams and sloughs from June through January.

Sockeye Salmon

Freshwater Eggs

EFH for sockeye salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*.

Freshwater Larvae and Juveniles

EFH for larval and juvenile sockeye salmon is the general distribution area for this life stage, located in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Juvenile sockeye salmon require year-round rearing habitat. Fry generally migrate downstream to a lake or, in systems lacking a freshwater lake, to estuarine and riverine rearing areas for up to 2 years. Fry out migration occurs from approximately April to November and smolts generally migrate during the spring and summer.

Estuarine Juveniles

Estuarine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within near-shore waters. Under-yearling, yearling, and older smolts occupy estuaries from March through early August.

Marine Juveniles

Marine EFH for juvenile sockeye salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska to depths of 50 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean from midsummer until December of their first year at sea.

Marine Immature and Maturing Adults

EFH for immature and maturing adult sockeye salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to depths of 200 m and range from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults

EFH for sockeye salmon is the general distribution area for this life stage, located in freshwaters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting of medium to course gravel containing less than 15 percent fine sediment (less than 2-mm diam.). Finer substrates can be used in upwelling areas of streams and sloughs from June through September. Sockeye often spawn in lake substrates as well as in streams.

Chinook Salmon

Freshwater Eggs

EFH for Chinook salmon eggs is the general distribution for this life stage, located in gravel substrates in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes.*

Freshwater Larvae and Juveniles

EFH for larval and juvenile Chinook salmon is the general distribution area for this life stage, located in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* (ADF&G 1998a) and contiguous rearing areas within the boundaries of ordinary high water. Juvenile Chinook salmon out-migrate from freshwater areas in April toward the sea and may spend up to a year in major tributaries or rivers, such as the Kenai, Yukon, Taku, and Copper Rivers.

Estuarine Juveniles

Estuarine EFH for juvenile Chinook salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within near-shore waters. Chinook salmon smolts and post-smolt juveniles may be present in these estuarine habitats from April through September.

Marine Juveniles

Marine EFH for juvenile Chinook salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean. Juvenile marine Chinook salmon are at this life stage from April until annulus formation in January or February during their first winter at sea.

Marine Immature and Maturing Adults

EFH for immature and maturing adult Chinook salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska and ranging from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults

EFH for adult Chinook salmon is the general distribution area for this life stage, located in fresh waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* wherever there are spawning substrates consisting of gravels from April through September.

Coho Salmon

Freshwater Eggs

EFH for coho salmon eggs is the general distribution area for this life stage, located in gravel substrates in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes*.

Freshwater Larvae and Juveniles

EFH for larval and juvenile coho salmon is the general distribution area for this life stage, located in those waters identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and contiguous rearing areas within the boundaries of ordinary high water. Fry generally migrate to a lake, slough, or estuary and rear in these areas for up to 2 years.

Estuarine Juveniles

Estuarine EFH for juvenile coho salmon is the general distribution area for this life stage, located in estuarine areas, as identified by the salinity transition zone (ecotone) and the mean higher tide line, within near-shore waters. Juvenile coho salmon require year-round rearing habitat and also migration habitat from April to November to provide access to and from the estuary.

Marine Juveniles

Marine EFH for juvenile coho salmon is the general distribution area for this life stage, located in all marine waters off the coast of Alaska from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine Immature and Maturing Adults

EFH for immature and maturing adult coho salmon is the general distribution area for this life stage, located in marine waters off the coast of Alaska to 200 m in depth, and ranges from the mean higher tide line to the 200-nm limit of the U.S. EEO, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Freshwater Adults

EFH for coho salmon is the general distribution area for this life stage, located in freshwaters as identified in ADF&G's *Catalogue of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes* and wherever there are spawning substrates consisting mainly of gravel containing less than 15 percent fine sediment (less than 2-mm diameter) from July to December.