# Kotzebue Harbor Feasibility Study

# Navigation Improvements at Cape Blossom

# Kotzebue, Alaska

## Appendix H: EFH Evaluation

US Army Corps
of Engineers
Alaska District

# Essential Fish Habitat Assessment
# Navigation Improvements at Cape Blossom
# Kotzebue, Alaska

The purpose of this document is to present the findings of the Essential Fish Habitat (EFH) Assessment conducted for the proposed navigational improvements at Cape Blossom per the Magnuson-Stevens Fishery Conservation and Management Act of 1976, as amended through 1996 (Magnuson-Stevens Act). The objectives of this EFH Assessment are to describe how the proposed navigational improvements at Cape Blossom may affect EFH designated by the National Marine Fisheries Service (NMFS) for the area of influence of the project. The area of influence of the project would be the waters of Cape Blossom within the Kotzebue Sound.

## Proposed Activity

The U.S. Army Corps of Engineers (USACE) is examining the feasibility of constructing large in-water trestles and gravity-filled structures for the purpose of a fuel dock in addition to the dredging of a channel to adequately accommodate the draft of modern fuel barges.

## Project Objectives

- Increase channel draft to aid in the adequate navigational safety and efficiency for modern vessels serving the hub community of Kotzebue, Alaska
- Reduce or eliminate the need for the lightering of goods and fuel from modern vessels
- Increase the efficiency and accessibility for the transfer of fuel and goods from Kotzebue to barges to the outlying villages of the Northwest Arctic Borough region

## Project Description

The existing natural navigational channel into Kotzebue is approximately 15 miles long and has insufficient depth for modern barges and tankers, which contributes to navigational inefficiencies and high costs of fuel and goods delivery. This results in vessels anchoring 15 miles from the Kotzebue Port for the purpose of lightering of goods and fuel, ultimately, at an increased cost to the community. These inefficiencies create economic and cultural problems for not only Kotzebue, but the outlying communities within the region as well. The proposed site of navigation improvement is located at Cape Blossom, 12 miles south of Kotzebue (Figure 1). This area was selected due to its access to deeper waters with consistent depths of at least - 20 ft MLLW (Mean Lower Low Water). An access road connecting Cape Blossom to Kotzebue is already under construction.

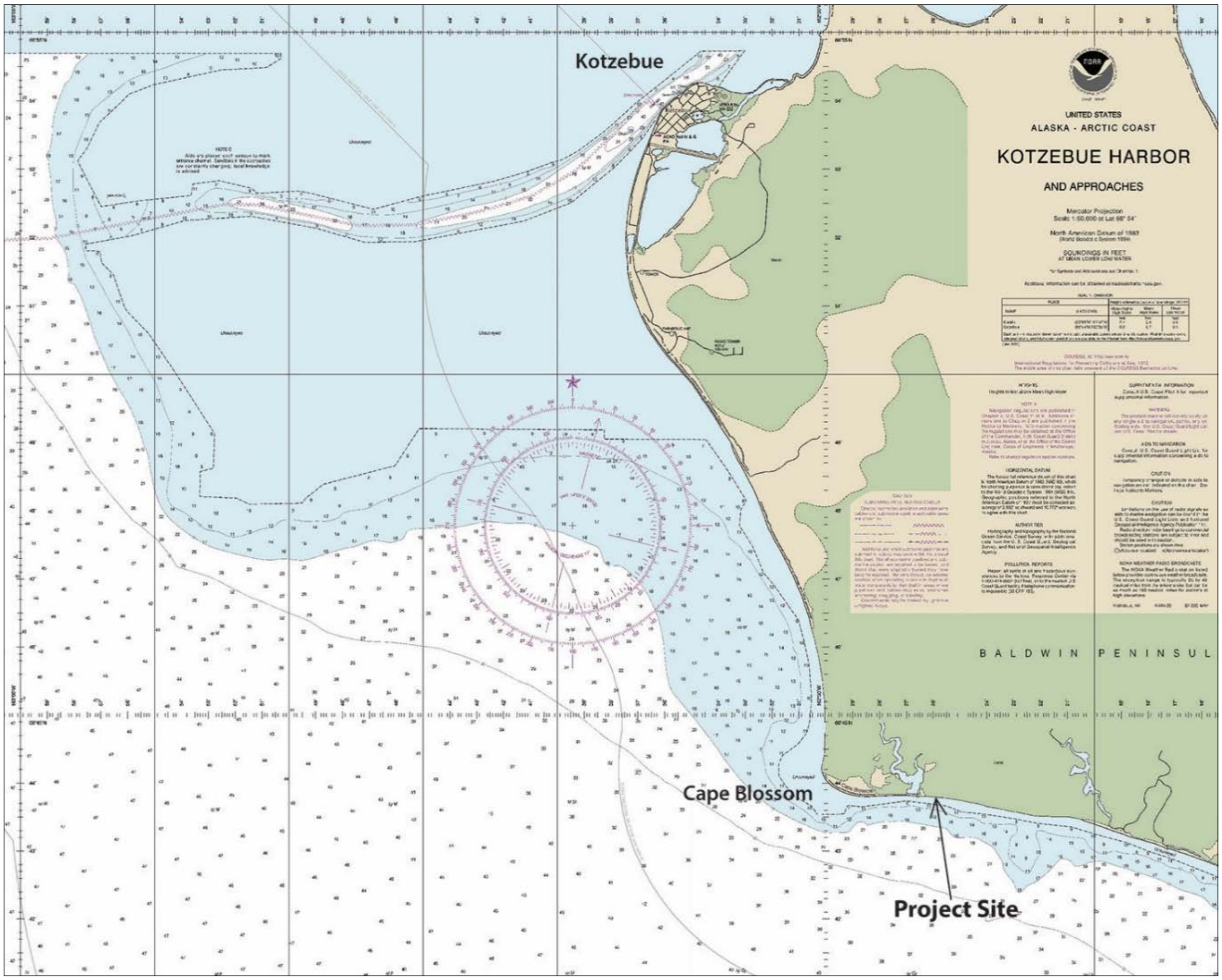


Figure 1. Existing bathymetry for Kotzebue area showing existing natural channel and proposed project site area (Basemap: NOAA 2018).

A concept drawing of the proposed project can be seen in Figure 2. The project would require the dredging of approximately 613,000 cubic yards (CY) of sediment from the Kotzebue Sound. A dock will extend approximately 1000 ft from shore to a depth of - 12 ft MLLW. The dredged channel will extend from the dock at - 12 ft MLLW for an additional 3,500 ft, ending at - 26 ft. MLLW. Dredged sediments will be placed approximately 1 mile west of the project footprint in the depth of closure. The design vessel for the project is a Crowley 450 series with dimensions 400 ft by 99.5 ft and a fully loaded draft at 20 ft.

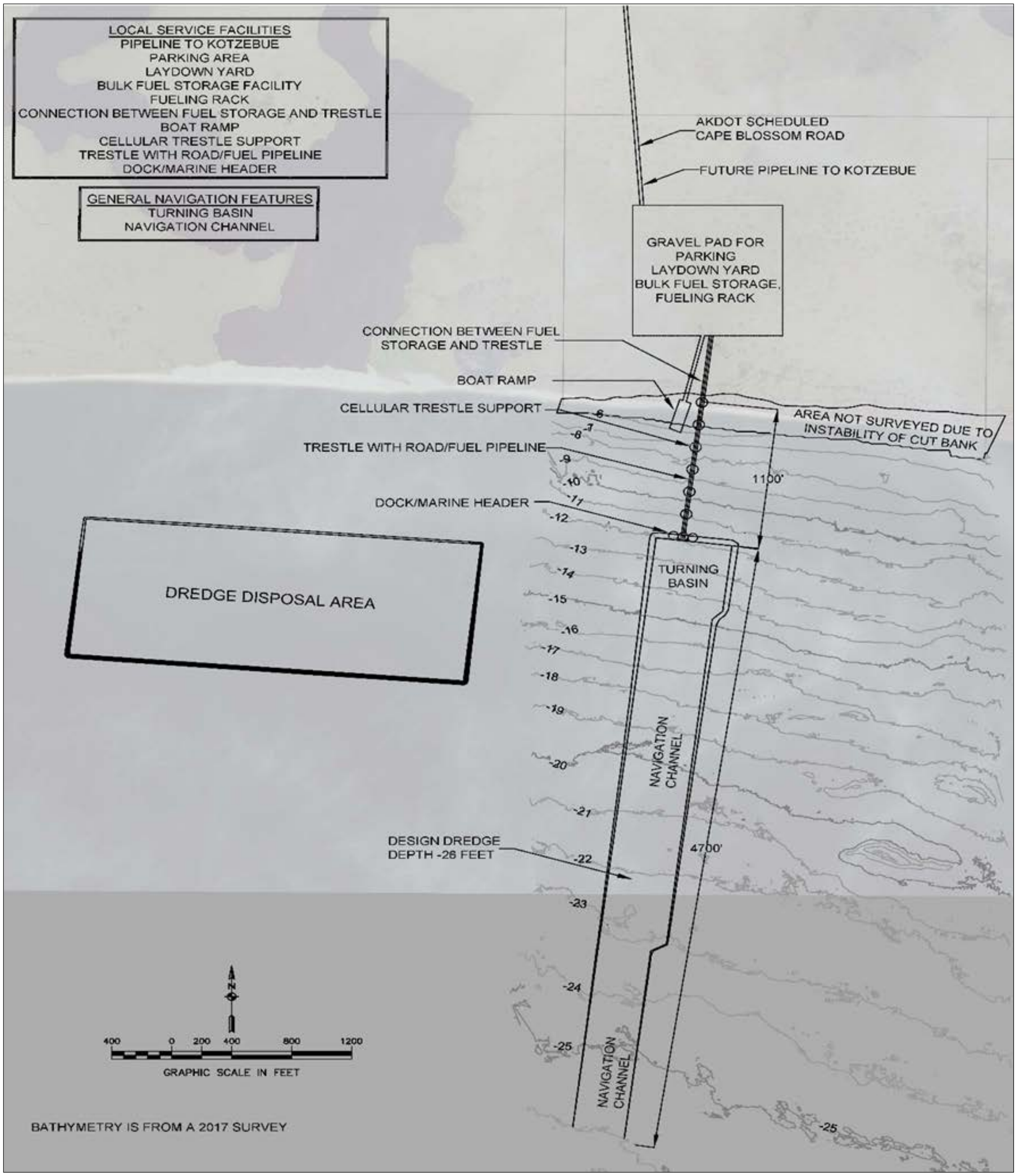

Figure 2. Concept drawing of proposed navigation improvements project.

## Constituent Elements of EFH by Species

The 1996 amendments to the Magnuson-Stevens Act set forth a mandate for NMFS, regional Fishery Management Councils (FMC), and other Federal agencies to identify and protect EFH of economically important marine and estuarine fisheries. To achieve this goal, suitable fishery habitats need to be maintained. The area of proposed action (Kotzebue Sound) has been identified as EFH under the Fishery Management Plan for Fish Resources of the Arctic

Management Area. Three EFH species are identified in the Arctic Fisheries Management Plan (NPFMC 2009) for Kotzebue Sound, while one EFH species is identified in the Salmon Fisheries Management Plan (NPFMC 2018) for Kotzebue Sound (Table 1).

Table 1. EFH stock from the Arctic FMP and Salmon FMP

| Arctic FMP EFH Species | Life History Stage | | | |
|---|---|---|---|---|
| | Eggs | Larvae | Late Juvenile | Adult |
| Arctic Cod | 0 | 0 | 1 | 1 |
| Saffron Cod | 0 | 0 | 1 | 1 |
| Snow Crab | 1 | 0 | 1 | 1 |
| Salmon FMP EFH Species | Eggs | Larvae | Late Juvenile | Mature |
| Chum Salmon | 0 | 0 | 1 | 1 |

**Arctic cod** (*Boreogadus saida*)

Insufficient information is available to determine EFH for Eggs, Larvae, and Early Juveniles.

Late Juveniles: EFH for late juvenile Arctic cod is the general distribution areas for this life stage located in pelagic and epipelagic waters from the nearshore to offshore areas along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout Arctic waters and often associated with ice floes which may occur in deeper waters.

Adults: EFH for adult Arctic cod is the general distribution area for this life stage located in pelagic and epipelagic waters from the nearshore to offshore areas along the entire shelf (0 to 200 m) and upper slope (200 to 500 m) throughout Arctic waters and often associated with ice floes for juvenile protection and winter spawning, which may occur in deeper waters.

**Saffron cod** (*Eleginus gracilis*)

Insufficient information is available to determine EFH for Eggs, Larvae, and Early Juveniles.

Late Juveniles: EFH for late juvenile saffron cod is the general distribution area for this life stage, located in pelagic and epipelagic waters along the coastline, within nearshore bays, and under ice along the inner (0 to 50 m) shelf throughout Arctic waters and wherever there are substrates consisting of sand and gravel.

Adults: EFH for adult saffron cod is the general distribution area for this life stage, located in pelagic and epipelagic waters along the coastline, within nearshore bays, and under ice along the inner (0 to 50 m) shelf throughout Arctic waters and wherever there are substrates consisting of sand and gravel. Spawning occurs during the winter nearshore and adults return to the colder waters offshore in the summer while juveniles remain in the shallow coastal waters.

**Snow Crab** (*Chinoecetes opilio*)

Insufficient information is available to determine EFH for Larvae and Early Juveniles.

Eggs: Essential fish habitat of snow crab eggs is inferred from the general distribution of egg-bearing female crab.

Late Juveniles: EFH for late juvenile snow crab is the general distribution area for this life stage, located in bottom habitats along the inner (0 to 50 m) and middle (50 to 100 m) shelf in Arctic waters south of Cape Lisburne, wherever there are substrates consisting mainly of mud.

Adults: EFH for adult snow crab is the general distribution area for this life stage, located in benthic habitats along the inner (0 to 50 m) and middle (50 to 100 m) shelf in Arctic waters south of Cape Lisburne, wherever there are substrates consisting mainly of mud for spawning. The habitat for Snow crab eggs is inferred from the general distribution of egg-bearing female crab adults.

**Chum salmon** (*Oncorhynchus keta*)

Marine Juveniles: Marine EFH for juvenile chum salmon is the general distribution area for this life stage, located in 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 EEZ, 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 EEZ, including the GOA, EBS, Chukchi Sea, and Arctic Ocean.

Marine juvenile and mature chum salmon in this EFH are in waters from nearshore to marine waters off the coast, with juveniles in mouths of rivers and bays before leaving freshwater and mature adults returning to spawn.

A study of Cape Blossom was conducted in August 2016 for the purpose of gathering information on the marine biota that may be affected by the construction and operation of the proposed project. Samples were taken through the efforts of beach seines and bottom trawling from a vessel. Of the total fish species captured, Saffron cod accounted for 51.2% of the catch and captured in both types of gear and was the only Arctic FMP EFH species sampled (Neff 2017). Noted in the report is the abundance of juvenile chum salmon reported in beach seines in June and early July but hardly encountered after mid-July. This study was conducted in August as shown by the date, no chum salmon were captured during this study.

## EFH Effects from Proposed Actions

EFH impacts from dredging activities may include loss of nearshore and benthic habitat, aquatic vegetation, original sediment type, topographical changes, direct removal/burial of organisms, increased turbidity in the water column, noise disturbances, demersal egg damage, suspended sediment plumes and destruction of benthic forage, cover, and faunal areas. Dock construction requiring the use of pile driving can generate pressure waves and excessive noise levels underwater effecting EFH depending on the pile material and placement technique. Temporary effects such as fish displacement, species disturbance, habitat disruptions, and water quality degradation are also included.

Water quality and quantity are the paramount EFH attributes for sustainable fisheries in Alaska and specifically in marine estuaries, nearshore zones, and offshore zones (Limpinsel 2017). The size and scope of this proposed project is of a much smaller footprint than expanding the current channel to become navigable at desired drafts and depths. Relating to water quality, sediment suspended in the water column, both up and down, during dredging in an attempt to maintain the local sediment bank is of concern. This multi-year operation will also be broken up into several different dredging and construction operating periods due to the inability to operate during periods of sea ice in the winter. With the key EFH attributes mind, the USACE's following conservation recommendations and best management practices will be explored and implemented.

**Best Management Practices**

Applicable best management practices to implement will reduce negative environmental effects and will be utilized when possible. Silt curtains during dredging operations contain and protect the surrounding water column from turbidity and sedimentation. The reuse of the channel dredged material is intended to be being placed west of the channel between the 10 ft – 20 ft isobaths, the depth of closure, to aid in maintaining the localized sediment budget with no loss of local sediment. Maintaining the natural sediment continues with the possibility of contributing to beach building and restoration as shown in previous USACE projects (Parson 2012). This local sediment is a valuable resource to be used for both conservation and restoration purposes and not be sent off for disposal or uplands use. Current dredge sediment suggests that are suitable for unconfined in-water disposal. Gaps will be placed within and through the structure to facilitate both near shore fish and marine mammal migration. Observers with independent authority to halt project work are expected for all in-water work for monitoring of proper safety, navigational, environmental, and marine mammal efforts.

**Effect Determination**

The proposed project and execution, along with the use of best management practices, the USACE believes there will not be any adverse effects on EFH species (Table 2). This effect determination is concluded predominately through the temporary, in both time and area, effects of the navigational improvements and the mitigating efforts of sediment retention.

Table 1. EFH Species and Possible Effects

| Common Name | Scientific Name | Possible Effects On: |
|---|---|---|
| Arctic cod | *Boreogadus saida* | Juvenile & Adults |
| Saffron cod | *Eleginus gracilis* | Juvenile & Adults |
| Chum salmon | *Oncorhynchus keta* | Juvenile & Mature |
| Snow crab | *Chionoecetes opilio* | Eggs |

A primary concern for the USACE is sediment retention within the local ecosystem. The importance of marine sediment is paramount in that they are largely responsible for organic matter mineralization, returning metabolites back to the water column, and a primary producer for nutrients for the seas above continental shelves (Thrush 2002). Current plans will achieve this through keeping the dredged material within the site to the west of the navigational channel. This introduced patchiness of sediment is likely to become attractive to exploitation of an abundance of species (Thistle 1981) as well as potentially used as a critical resource for beach restoration (Parson 2012). Additionally, the possibility of a submerged outtake is being explored to keep the sediment remaining submerged at all times.

In regards to local species and EFH, the effort of dredging in itself should result in limited effects on the local population. Lethal effects directly caused from dredging are most likely to be experienced from eggs and larvae of species (Wenger 2017). For species such as the Saffron cod, this presents little danger as they tend to spawn in sandy-pebble areas whereas the Kotzebue Sand substrate can be described as muddy-sand (Jewett 2009). Additionally, the Saffron cod spawn during the winter season which would be during periods of no dredging. Similarly, the Arctic cod spawns during the winter at sea. The snow crab has potential to experience egg loss but typically establish within muddy bottoms at deeper depths.

A mitigation measure of silt curtains will be used as an effort to reduce the impacts of turbidity and suspension in the water column. Possible consequences from dredging effects such as water quality, increased turbidity, entrainment, and sound are shown to be avoided by adult and even juvenile fish as well as low overall mortality rates for entrainment and lethal response for underwater sound in fish (Wenger 2017). Sea ice in the winter season will not allow dredging or construction reducing year-round water quality and turbidity issues.

## **References**

Jewett, S., Clough, L., Blanchard, A., Ambrose, W., Feder, H., Hoberg, M. and A. Whiting. 2009. Nearshore Macrobenthos of Northern Kotzebue Sound, Alaska with Reference to Local Sewage Disposal. *Polar Biology* 32(11):1665-1680.

Limpinsel, D., Eagleton, M., and J. Hanson. 2017. Impacts to Essential Fish Habitat from Non-Fishing Activities in Alaska. EFH 5 Year Review: 2010 through 2015. NOAA Technical Memorandum, NMFS-F/AKR-14. U.S. Department of Commerce.

Neff, D. 2017. Nearshore Marine Biota in the Vicinity of Cape Blossom in Kotzebue Sound, Alaska. Alaska BioMap. Prepared for the U.S. Army Corps of Engineers, Alaska District.

North Pacific Fishery Management Council (NPFMC). 2009. Fishery Management Plan for Fish Resources of the Arctic Management Area.

North Pacific Fishery Management Council (NPFMC). 2018. Fishery Management Plan for the Salmon Fisheries in the EEZ off Alaska. Prepared for the North Pacific Fishery Management Council, National Marine Fisheries Service Alaska Region, and State of Alaska Department of Fish and Game.

Parson, L., and R. Swafford. 2012. Beneficial Use of Sediments from Dredging Activities in the Gulf of Mexico. *Journal of Coastal Research* 60:45-50.

Thistle, D. 1981. Natural Physical Disturbances and Communities of Marine Soft Bottoms. *Marine Ecology Progress Series* 6:223-238.

Thrush, S., and P. Dayton, P. 2002. Disturbance to Marine Benthic Habitats by Trawling and Dredging: Implications for Marine Biodiversity. *Annual Review of Ecology and Systematics* 33:449-473.

Wenger, A., Harvey, E., Wilson, S., Rawson, C., Newman, S., Clarke, D., Saunders, B., Browne, N., Travers, M., McIlwain, J., Erftemeijer, P., Hobbs, J-P., McLean, D., Depczynski, M. and R. Evans. 2017. A Critical Analysis of the Direct Effects of Dredging on Fish. *Fish and Fisheries* 18:967-985.