

PRELIMINARY ASSESSMENT FOR MAINTENANCE
DREDGING SEARSPORT HARBOR FEDERAL
NAVIGATION PROJECT - SEARSPORT, MAINE

APPENDIX H
ESSENTIAL FISH HABITAT ASSESSMENT

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Essential Fish Habitat Assessment
Searsport Harbor
Federal Navigation Project
Maintenance Dredging
Searsport, Maine

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ABBREVIATIONS AND ACRONYMS

A	adults
°C	degrees Celsius
cm	centimeter
DO	dissolved oxygen
E	eggs
EFH	Essential Fish Habitat
EJ	early juveniles
F	fall
ft	feet
J	juveniles
L	larvae
LJ	late juveniles
m	meters
MAB	Mid-Atlantic Bight
MLW	Mean Low Water Mark
mm	millimeters
MSFCMA	Magnuson-Stevens Fishery Conservation and Management Act of 1976
NEFMC	New England Fisheries Management Council
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Services
ppt	parts per thousand
S	summer
SNE	southern New England
Sp	spring
TL	total length
W	winter
YOY	young-of-the-year

1.0 Introduction

In accordance with the Magnuson-Stevens Fishery Conservation and Management Act, this assessment identifies the potential impacts of the United States Army Corps of Engineers (USACE), New England District's proposed maintenance dredging of the Searsport Harbor Federal Navigation Project (FNP) on essential fish habitat (EFH). The Magnuson-Stevens Act as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) set forth a number of mandates for the National Marine Fisheries Service (NMFS), regional fishery management councils, and other federal agencies to identify and protect important marine and anadromous fish habitat. EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The regulations further clarify EFH by defining "waters" to include aquatic areas that are used by fish (either currently or historically) and their associated physical, chemical, and biological properties; "substrate" to include sediment, hard bottom, and structures underlying the water; and areas used for "spawning, breeding, feeding, and growth to maturity" to cover a species' full life cycle. The Searsport Harbor FNP, the location of the proposed confined aquatic disposal (CAD) cells in Searsport Harbor, and the Rockland Disposal Site (RDS) may provide habitat for fish species.

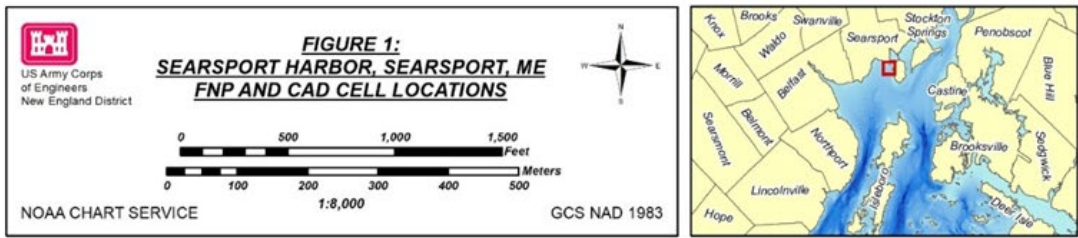
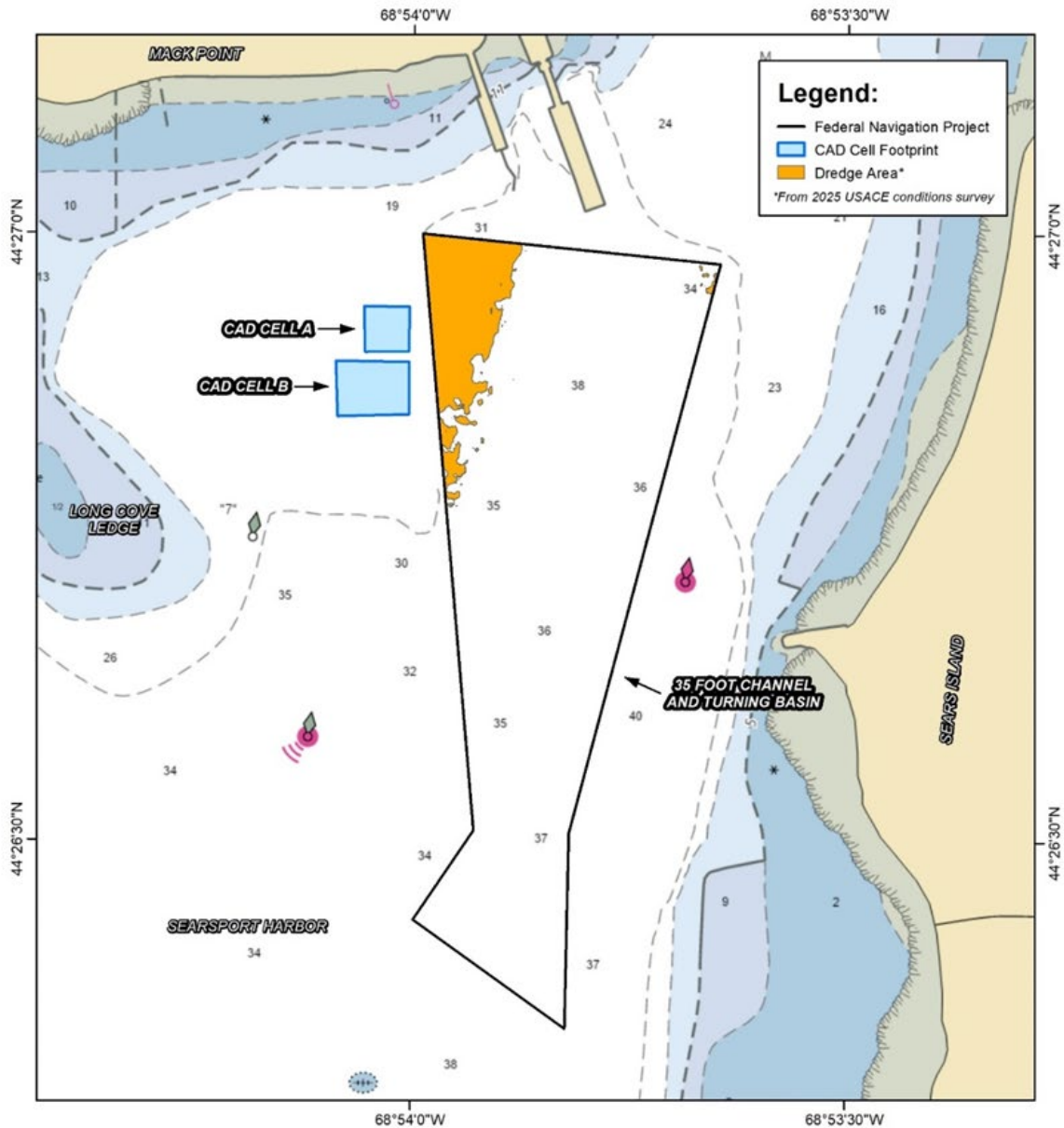
2.0 Project Description and Setting

USACE is proposing to dredge approximately 39,000 cubic yards (cy) of unsuitable mixed sand and fine grained sediments from shoaled areas totaling seven acres within the Searsport Harbor FNP located in Searsport, Maine (Figure 1). These areas will be dredged to the authorized project depth of 35 feet at mean lower low water (MLLW) plus allowable over depth. The 39,000 cy of unsuitable shoaled material will be mechanically dredged and placed in two nearby CAD cells that will be created in Searsport Harbor.

Two CAD cells (A and B) will be created in Searsport Harbor (Figure 1). It has been determined that the surficial 3-feet of sediments in both CAD cells, approximately 5,200 cy in CAD cell A and approximately 10,200 cy in CAD cell B, are unsuitable for open water placement. As a result, CAD cell A will be dredged first with the 5,200 cy of unsuitable material retained in scows and placed back into CAD cell A following its construction. The materials in CAD cell A below the surficial layer, approximately 17,000 cy, have been deemed suitable for open water placement and will be placed at the RDS (Figure 2). CAD cell A will receive its own unsuitable surficial sediment and will also receive the unsuitable surficial sediments from the creation of CAD cell B. The remaining suitable material from CAD cell B, approximately 43,600 cy, will be removed and placed at RDS. The CAD cells will be allowed to accumulate natural sediment deposition above unsuitable sediment placed in both CAD cells A and B resulting in a "cap" of sediment.

Searsport Harbor is located at the mouth of the Penobscot River in the northern portion of Penobscot Bay. The Federal Navigation project in Searsport Harbor consists of an entrance channel and turning basin that is 500-foot wide, 3,500 feet long, and 35 feet deep (MLLW). The entrance channel flares out to form a turning basin that is 1,500 feet wide and 35 feet deep (MLLW) in the inner harbor adjacent to Mack Point. Searsport Harbor is the largest deep draft commercial port north of Portland, Maine. The State Pier at Mack Point handles aggregates, forest products and other bulk cargos. The Sprague Energy terminal is located immediately to the west of the State

Pier and handles petroleum and other liquid bulk products. Land use adjacent to the harbor is primarily commercial with the exception of the largely undeveloped 941-acre Sears Island located to the east.



3.0 Analysis of Impacts

The impacts from the proposed Searsport Harbor maintenance dredging project include short-term impacts to water quality from increased suspended sediments and the temporary loss of the benthic forage base within the project footprint of the FNP, CAD cell sites, and RDS.

3.1 Physical Environment

Water Quality

Impacts to EFH in Searsport Harbor from the dredging of the Searsport Harbor FNP are expected to be temporary, short term, and limited to the project area. Water quality impacts would be primarily a result of minor increases in suspended sediment (TSS) loads within the water column as a result of the dredging operations. Unsuitable sediments will be removed and disposed of in CAD cells within the harbor and will not result in any significant negative impacts to water quality. Any increases in the turbidity of waters in the vicinity of the proposed CAD cells will be temporary and short term.

Impacts to EFH at RDS are also anticipated to be temporary, short term, and limited to the area surrounding material placement. Impacts to water quality will be limited to temporary increases in turbidity following disposal events. The material has been found suitable for open water placement, so no significant effects to water quality chemistry are expected,

Dissolved oxygen levels are sometimes a concern with dredging and placement activities; however, both Searsport Harbor and RDS are well flushed by tidal activity. No appreciable changes in the salinity regime, tidal flows, or tide height are expected as a result of the proposed dredging and placement activity.

Abiotic Habitats

The Searsport Harbor FNP is authorized to a depth of -35 feet MLLW plus allowable over depth. Maintenance dredging will remove a shoal composed of approximately 39,000 cubic yards of sand and silt. The main impacts to the abiotic habitats in Searsport Harbor will be short-term and localized increases in turbidity associated with dredging activities and the removal of the benthic invertebrate community in the direct footprint of the dredge and CAD cell areas (approximately 7 acres and 5 acres respectively) and the burying of the benthic community at RDS. Surveys of the benthic communities in the Searsport Harbor FNP show low diversity and abundance numbers. Community structure in the subtidal benthic habitat following dredging and the placement of dredged material is expected to return to similar conditions following construction of the project. As the benthic community throughout the existing FNP is a mix of opportunistic early-successional stage benthic communities and mid-successional stage benthic communities, a return to a similar community following dredging is expected within approximately 1-3 years.

Turbidity impacts to the water column habitat are dependent on the concentration and the duration of the suspended sediments (Wilber and Clarke, 2001; Suedel 2014). Motile organisms (e.g., fish, lobster and crab) can generally avoid unsuitable conditions in the field and, under most dredging

scenarios, encounter localized suspended sediment plumes for exposure durations of minutes to hours. As the increases to turbidity in the water column and near bottom habitats are expected to be short-term and localized and the sediments within the project area are anticipated to be similar to existing conditions following dredging, the proposed project is not anticipated to significantly impact EFH for any managed species.

3.2 Biological Environment

3.2.1 Prey Species

The abundance and/or distribution of prey species for fish of which EFH has been designated in the project area will be impacted from dredging and placement activities. Many of the managed fish species feed on organisms that live in or on the sediment and have the potential to be buried by the direct material placement and/or by removal during the dredging process. Following project completion, the majority of the substrate type at the dredging locations and placement locations will be similar to their existing conditions. As such, recolonization by organisms from adjacent areas and a return of benthic prey assemblages to a pre-dredge conditions is expected to occur.

4.0 Essential Fish Habitat

4.1 Designated Species

Searsport Harbor, the Federal Navigation Project, and RDS have the potential to provide habitat for fish species in the area. Per EFH source documents (NEFMC/NMFS, 2022), Table 1 denotes the federally managed species and their associated life stages that have EFH within the project area. Table 2 denotes the federally managed species with the potential for habitat area of particular concern (HAPC) within the project area.

Table 1. Federally managed species and their associated life stages which have EFH within the project area. X denotes the project site (CAD cells and FNP area) and D denotes RDS

Species	Eggs	Larvae	Juveniles	Adults
American Plaice (<i>Hippoglossoides platessoides</i>)	X, D	X, D	X, D	X, D
Atlantic Butterfish (<i>Peprius triacanthus</i>)			X, D	X, D
Atlantic Cod (<i>Gadus morhua</i>)	D	X, D	X, D	X, D
Atlantic Herring (<i>Clupea harengus</i>)		X, D	X, D	X, D
Atlantic Mackerel (<i>Scomber scombrus</i>)			X, D	X, D
Atlantic Salmon (<i>Salmo salar</i>)	X, D	X, D	X, D	X, D
Atlantic Sea Scallop (<i>Placopecten magellanicus</i>)	X, D	X, D	X, D	X, D
Atlantic Wolfish (<i>Anarhichas lupus</i>)	X, D	X, D	X, D	X, D
Bluefin Tuna (<i>Thunnus thynnus</i>)				D
Bluefish (<i>Pomatomus saltatrix</i>)			X, D	X, D
Haddock (<i>Melanogrammus aeglefinus</i>)			X	
Little Skate (<i>Leucoraja erinacea</i>)			X, D	X, D
Ocean Pout (<i>Zoarces americanus</i>)	X, D		X, D	X, D
Pollock (<i>Pollachius virens</i>)			X, D	
Red Hake (<i>Urophycis chuss</i>)	X, D	X, D	X, D	X, D
Silver Hake (<i>Merluccius bilinearis</i>)	D	D	D	X, D
Smooth Skate (<i>Malacoraja senta</i>)			X, D	
Thorny Skate (<i>Amblyraja radiata</i>)			X, D	
White Hake (<i>Urophycis tenuis</i>)		D	X, D	X, D
Windowpane Flounder (<i>Scopthalmus aquosus</i>)	X, D	X, D	X, D	X, D
Winter Flounder (<i>Pseudopleuronectes americanus</i>)	X, D	X, D	X, D	X, D
Winter Skate (<i>Leucoraja ocellata</i>)			X	

Table 2. Species with Habitat Area of Particular Concern in the proposed project area.

Species	Eggs	Larvae	Juveniles	Adults
Atlantic Cod (<i>Gadus morhua</i>)			X	
Atlantic Salmon (<i>Salmo salar</i>)	X, D	X, D	X, D	X, D

4.2 Individual Species Assessments

American Plaice (*Hippoglossoides platessoides*): All Stages, All Locations

Life History Information: American plaice eggs and larvae are distributed similarly, inhabiting pelagic habitats of the GOM and high salinity zones of bays and estuaries. American plaice juveniles and adults inhabit sub-tidal benthic habitats in the Gulf of Maine between 40 and 180 meters, including mixed and high salinity zones in coastal bays and estuaries. Essential fish habitat for both juveniles and adults consists of soft bottom substrates, like mud and sand, as well as areas consisting of gravel or sand substrates bordering bedrock (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely for any life stage of American plaice to occur within the project site, as eggs and larvae mainly inhabit pelagic waters, and juveniles and adults prefer depths deeper than those found within the project area. Therefore, no significant impacts to American plaice and their associated EFH are expected due to the proposed project.

Atlantic Butterfish (*Peprilus triacanthus*): Juvenile and Adult; All Locations

Life History Information: Atlantic Butterfish are demersal fish that live in inshore estuaries and embayments from Massachusetts Bay to Pamlico Sound, North Carolina. EFH for adult Atlantic butterfish is generally found over bottom depths between 10 and 250 meters where bottom temperatures range between 4.5 and 27.5 °C and salinities are above 5 ppt. However, EFH in pelagic habitats for adults includes inshore estuaries. More specifically, they can be found in inshore waters of the Gulf of Maine, the South Atlantic Bight, and the southern continental shelf from southern New England to South Carolina (Mid-Atlantic Fishery Management Council, 2011).

Occurrence in Project Area and Impacts: Atlantic butterfish adults may be found within Searsport Harbor. However, as the adult life stage of this species is motile, butterfish should be able to avoid the area during periods of disturbance from construction by moving to adjacent non-disturbed areas. The proposed project is not anticipated to permanently alter bottom habitats significantly and all impacts are expected to be short-term and localized. Therefore, no significant impact to Atlantic butterfish and their associated EFH are expected due to the proposed project.

Atlantic Cod (*Gadus morhua*): Larvae, Juveniles, and Adults at Project Site; All Stages at RDS

Life History Information: Atlantic cod eggs and larvae can be found in pelagic habitats in the Gulf of Maine, on Georges Bank, and in the Mid-Atlantic region in high salinity areas in bays and estuaries. As these fish turn into juveniles, they can be found in these same areas, as well as in the intertidal and sub-tidal benthos of the Gulf of Maine. Unlike other fish, juvenile Atlantic cod are highly dependent on complex habitats such as eelgrass, mixed sand and gravel, and rocky habitats (gravel, cobble, and boulder), with and without attached macroalgae and emergent epifauna. Once they have reached adulthood, Atlantic cod will stay in sub-tidal benthic habitats

in the south of Cape Cod between 30 and 160 meters, including high salinity zones in bays and estuaries. Like juveniles, structurally complex hard bottom sediments are essential for adult cod (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely that juvenile and adult Atlantic cod will be found at the project site as their preferred depths are deeper than those found within the project area. Additionally, the bottom habitat of both the Searsport Harbor FNP and proposed CAD cells are not structurally complex. The subtidal bottoms in Searsport Harbor are fine sands and silt sediments. As larvae can occur up to the intertidal zone and are not mobile, it is possible that they may be impacted by turbidity caused by the project activity. Therefore, some impacts to larval Atlantic cod may be realized. However, as all the impacts from the proposed project are anticipated to be short-term and localized, no significant impacts to larval cod EFH are expected.

Atlantic Herring (*Clupea harengus*): Larvae, Juveniles, and Adults; All Locations

Life History Information: Atlantic herring larvae primarily inhabit inshore and offshore pelagic habitats in the Gulf of Maine and are transported long distances in estuarine waters where they metamorphose into juveniles. Similarly, juveniles and young of the year are abundant in intertidal and sub-tidal pelagic habitats to 300 meters. As juveniles grow, they begin to school and make limited seasonal inshore-offshore migration. Additionally, older juveniles tend to prefer colder temperatures around 3 to 5 °C and very low salinity waters. Adult Atlantic sea herring live in sub-tidal pelagic habitats with maximum depths up to 300 meters. However, spawning generally takes place in depth from 5 to 90 meters (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Larval, juvenile, and adult Atlantic herring are not expected to be within the project area in great numbers as their preferable depths are deeper than those found within the project areas. In addition, all three life states are pelagic and will likely be unaffected by any dredging activity. Therefore, no significant impacts to Atlantic herring and their associated EFH are expected.

Atlantic Mackerel (*Scomber scombrus*): Juveniles and Adults; All Locations

Life History Information: Atlantic Mackerel are found in the northwest Atlantic from the Gulf of St. Lawrence to the Cape Lookout, North Carolina with two spawning contingents. Juvenile Atlantic mackerel inhabit pelagic waters in inshore estuaries and embayments from Passamaquoddy Bay and Penobscot Bay, Maine to the Hudson River. In the Gulf of Maine juveniles rely on benthic habitats between 10 to 110 meters in depth and temperatures between 5°C and 20°C. Once Atlantic mackerel reach adulthood, they reside in bottom depths less than 170 meters and in water temperatures of 5°C to 20°C (Mid-Atlantic Fishery Management Council, 2011).

Occurrence in Project Area and Impacts: It is possible for juveniles to occur in the project area as they could reside in depths similar to those found in the proposed project area. However, because both life stages are motile, they can avoid the project area during periods of disturbance due to construction by moving to adjacent non- disturbed areas. The proposed project is not anticipated to alter bottom habitats significantly and all impacts are expected to be short-term and localized.

Therefore, no significant impacts to Atlantic mackerel and their associated EFH are expected due to the proposed project.

Atlantic Salmon (*Salmo salar*) All Stages; All Locations

Life History Information: EFH designation for Atlantic salmon includes the rivers, estuaries, and bays. The oceanic component of EFH would be limited to a distance of three miles from the mouth of each river. A variety of riverine, lacustrine, estuarine, and coastal marine habitats used by older juvenile Atlantic salmon during their downstream migration to the sea, by mature adult salmon during their upstream spawning migration, and by spent adults (kelts) following spawning, before they return to the ocean.

Occurrence in Project Area and Impacts: It is unlikely that Atlantic salmon smolts or adults will be affected by project activities as they would be transiting the project areas in spring and summer respectively. Project activities are due to take place during the fall/winter seasons. Only kelts, the approximately 1 to 6 % of adult salmon who survive spawning, would be dropping back down rivers after spawning and may be transiting active project locations.

Atlantic Sea Scallop (*Placopecten magellanicus*): All Stages; All Locations

Life History Information: Atlantic sea scallop eggs live in benthic habitats on the continental shelf in inshore areas near adult scallops. With time, eggs will develop into free-swimming larvae. However, despite their ability to swim, larvae typically inhabit benthic areas in inshore and offshore regions. Specifically, essential habitat for larvae consists of any hard surface such as shells, pebbles, and gravel. Additionally, they can also attach to macroalgae and other benthic organisms such as hydroids. Juvenile Atlantic sea scallops also inhabit benthic habitats in the Gulf of Maine (GOM), ranging in depth from 18 to 110 meters. Once juveniles are between 5-12 mm in shell height, they will leave the original substrate they settled in and attach themselves to shells, gravel, and small rocks. As they grow older, they lose their byssal attachments and as adults will occur in aggregations in beds. Adult Atlantic sea scallops also are known to reside in the GOM at depths between 18 and 110 meters but can be found in shallower and deeper habitats (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely that Atlantic sea scallop eggs will be affected by the project activity as they live in shallower depths than those in the project area. Conversely, it is likely that Atlantic sea scallop larvae, juveniles, and adults could be affected as they reside within depths and habitats similar to those of the project area. Therefore, these life stages are more at risk to turbidity from dredging activities. However, for juveniles and adults who can swim proficiently, it is expected that they will move to avoid dredging activity. Following construction activities, the sediment type of the FNP and the proposed CAD cell are expected to be similar to existing conditions. As such, although temporary impacts to Atlantic sea scallop life stages may be realized, no long-term impacts to their associated EFH are expected.

Atlantic Wolfish (*Anarhichas lupus*): All Stages; All Locations

Life History Information: Atlantic wolfish eggs generally collect as masses and reside in the sub-tidal under benthic rocks at depth less than 100 meters. As the eggs hatch into larvae, they remain

in the sub-tidal zone in benthic habitats for up to six days, before becoming buoyant as the yolk sac is absorbed. Once the larvae grow into juveniles, they inhabit sub-tidal, benthic habitats of various substrates, at depths ranging from 70 to 184 meters. After growing close to 65 cm TL, Atlantic wolfish are considered adults. Adults often live in sub-tidal, benthic habitats, at depths less than 173 meters (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely that most life stages of Atlantic wolfish will be found within the project site as their preferable depths are deeper those found within the project area. However, when Atlantic wolfish eggs become buoyant, it is possible they could be found within the project area, making them vulnerable to any turbidity caused by project activity. However, turbidity impacts from the proposed project will be short-term and localized. Therefore, while temporary impacts to wolfish egg EFH may occur, no long-term adverse impacts to wolfish EFH are expected.

Bluefin Tuna (*Thunnus thynnus*): Adult; RDS

Life History Information: The bluefin tuna *Thunnus thynnus* is distributed in many regions including the warmer parts of the Atlantic, Pacific, and Indian oceans, as well as the Mediterranean Sea. In the western Atlantic, the bluefin tuna ranges from Labrador south along the U.S. coast into the Gulf of Mexico and the Caribbean and from Venezuela to Brazil. Bluefin tuna are a strong swift swimming migratory pelagic species. They school by size and are common in the Gulf Stream. In July through October, bluefin tuna will congregate on the continental shelf off New England. Spawning is believed to occur in May and June in the Straits of Florida and does not appear to occur north of this along the U.S. coast. Bluefin tuna eggs and larvae are pelagic and drift in the currents. Small juveniles arrive to feed in the northeastern Atlantic (Virginia to Cape Cod) in mid-June to July and will spend the winter above the 36°N in offshore waters warmer than 16 to 17°C.

Occurrence in Project Area and Impacts: Impacts to bluefin tuna at the proposed project sites are expected to be minimal. Impacts to the water column habitat from dredged material disposal are expected to be short term and localized, therefore no significant effects to adult Bluefin tuna EFH are expected.

Bluefish (*Pomatomus saltatrix*): Juveniles and Adults; All Locations

Life History Information: Bluefish occurs within temperate and semi-tropical waters world-wide but are often found near Cape Hatteras, Montauk Point, West Keys, Nantucket Island, Cape Cod Bay, and a plethora of North Atlantic estuaries. Juvenile bluefish occur in the upper 20 m of the North Atlantic, Mid-Atlantic, and South Atlantic estuaries from June through October, May through October, and March through December, respectively. Adults are also found in these three regions of estuaries, slightly differing in time frame, and occur in normal shelf salinities (>25 ppt) ranging in depth from 6 to 30 m (Mid-Atlantic Fishery Management Council, 2011).

Occurrence in Project Area and Impacts: Bluefish juveniles and adults may be found within the project area depending on the time of year. As juvenile and adult life stages of this species are motile, they can avoid the area during periods of disturbance from construction by moving to adjacent non-disturbed areas. The proposed project is not anticipated to alter bottom habitats significantly and all impacts are expected to be short-term and localized. Therefore, no

significant impact to bluefish and their associated EFH are expected due to the proposed project.

Haddock (*Melanogrammus aeglefinus*): Juvenile; Project Area

Life History Information: Juvenile haddock are found most abundantly in sub-tidal benthic habitats between 40 and 140 meters in the GOM. However, along the coast of Massachusetts, they can be found as shallow as 20 meters. Initially, YOY juveniles of Georges Bank are known to settle on areas predominately made of sand and gravel, but after a few months can be found primarily on gravel substrates. As juveniles grow, they are known to disperse over a variety of substrate types on Georges Bank (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Although juvenile haddock can potentially occur in habitats at depths within the project area, it is unlikely they will be affected by the project activity. Turbidity impacts from the proposed project will be short-term and localized. As juvenile haddock are highly mobile, it is expected they will move to deeper waters to avoid construction areas. As impacts from the proposed project will be temporary, no significant effects to juvenile EFH are expected.

Little Skate (*Leucoraja erinacea*): Juvenile and Adults; All Locations

Life History Information: This species ranges from Nova Scotia, Canada to Cape Hatteras. It is most abundant in the northern section of the Mid-Atlantic Bight (MAB) and on the northeastern part of Georges Bank. Little skate exhibit seasonal movements. Adult and juvenile little skate move inshore during spring and autumn, and offshore in mid to late summer, and midwinter. They also move north and south with seasonal temperature changes along the southern fringe of their range. They may leave some estuaries for deeper water during warmer months. Little skates are common on sandy or gravelly substrates but may occur on mud as well. They tend to bury themselves in depressions during the day and become active at night. (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Both juveniles and adult skates may occur within the project area during those periods in which they are expected to move inshore. As both life stages of this species are motile, during construction they can avoid the area during periods of disturbance. No significant impacts to little skate and their associated EFH are expected due to the construction of the proposed project as all impacts to skate EFH are expected to be short-term and highly localized.

Ocean Pout (*Zoarces americanus*): Eggs, Juveniles, and Adults; All Locations

Life History Information: Ocean pout eggs, juveniles, and adults all prefer benthic habitats. EFH for eggs occur in depths less than 100 meters, in rocky bottom habitats where they are sheltered by the coarse sediment. Juveniles specifically inhabit intertidal and subtidal benthic habitats extending to 120 meters in the GOM. Juvenile EFH consists of a wide variety of sediments such as shells, rocks, algae, soft sediments, sand, and gravel. Similarly, adults are often found in sub-tidal benthic habitats between 40 and 140 meters. Adult EFH includes mud and sand where they are known to burrow tail first. They also utilize structure forming habitats such as shells, gravel, or boulders for protection and are known to occupy nesting holes under rocks or crevices in depths less than 100 meters prior to spawning. All three life stages also prefer the high salinity

zones of several bays and estuaries (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Although juvenile and adult ocean pout and their EFH occur within the project area, it is unlikely they will be vulnerable to project activity. It is expected that both life stages will temporarily move to other areas to avoid any dredging. As all impacts are expected to be temporary and localized and the bottom habitat will remain similar to pre-construction conditions, no more than minimal impacts to ocean pout juvenile and adult EFH are anticipated. Ocean pout eggs may be susceptible to damage from dredging activity as they occur in benthic habitats in depths less than 100 meters, habitat which is present in the project area. However, as the impacts to the habitat will be short-term and highly localized, no significant impacts to ocean pout eggs are likely.

Pollock (*Pollachius virens*): Juvenile; All Locations

Life History Information: Juvenile pollock inhabit inshore and offshore benthic habitats ranging in depth from the intertidal zone to 180 meters in the GOM. As juveniles get older, they tend to move to deeper waters also occupied by adults. EFH for juvenile pollock consists of rocky bottom habitats with attached macroalgae, such as rockweed and kelp, that provide refuge from predators. However, EFH for YOY pollock in the GOM comprises shallow water eelgrass beds (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Although it is possible for juvenile pollock to be within the limits of the proposed project, it is unlikely they will be affected. Due to their mobility, most juveniles would be expected to move out of an active dredging area or a dredged material burial area. The impacts from the proposed project are not expected to permanently alter the habitat type in the area. Therefore, no significant impacts to pollock EFH expected from the construction of the proposed project.

Red Hake (*Urophycis chuss*): All Stages; All Locations

Life History Information: This species spawns along the continental shelf off southern New England and eastern Long Island. Larvae dominate the summer ichthyoplankton in the Mid Atlantic Bight and are most abundant on the mid-and outer continental shelf. Eggs and larvae are pelagic with demersal settlement beginning in the juvenile stage, generally occurring in the fall. Juveniles seek shelter and commonly associate with scallops, surf clam shells, and seabed depressions. Their preferred substrate is mud, water depths range between 5- 50 m, salinities between 24-32 ppt, and temperatures between 2-22 °C. Adults were generally found in abundance within the GOM in benthic habitats and the out continental shelf and slope in depths of 50 to 750 meters. Like juveniles, adults prefer soft sediments such as mud and sand where there are depressions and other structural habitats (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Eggs and larval red hake are not expected to be impacted by the proposed dredging or placement alternatives as they primarily inhabit pelagic waters. Juvenile and adult red hake may be found in the project area but are not expected to be present in significant numbers. The depth and structure of the bottom habitat in the project area is preferred by red hake. For this reason, temporary increases in turbidity at the project site would be expected to displace individuals of this species. However, no significant impacts to red hake and their associated EFH are expected from the construction of the proposed project as all impacts to their

EFH are expected to be short-term and highly localized.

Silver Hake (*Merluccius bilinearis*): Adult, Project area; All Stages, RDS

Life History Information: Silver hake adults predominantly live in pelagic and benthic habitats in the GOM at depths greater than 35 meters. Adults are often found in bottom depressions or in association with sand waves and shell fragments, as well as in mud habitats bordering deep boulder reefs. Additionally, red hake utilize the water column at night for feeding purposes (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Silver hake are unlikely to be impacted from the construction of the proposed project because they live in depths greater than those within the project area. Therefore, no significant impacts to silver hake and their associated EFH are expected.

Smooth Skate (*Malacoraja senta*): Juvenile; All Locations

Life History Information: Smooth skate juveniles prefer benthic habitats between 100 and 400 meters in the GOM, on the continental slope to a depth of 900 meters, and in depths less than 100 meters in the high salinity zones of a number of bays and estuaries along the Maine coast. Additionally, essential fish habitat for juveniles in the GOM consists of areas offshore with soft mud, sand, broken shells, gravel, and pebbles (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely for juvenile smooth skates to occur within the project site as prefer depths deeper than those within the project area. Therefore, no significant impacts are expected to smooth skates and their associated EFH are expected due to the proposed project.

Thorny Skate (*Amblyraja radiata*): Juvenile; All Locations

Life History Information: Thorny skate juveniles inhabit benthic areas between 35 and 400 meters in the Gulf of Maine and on the continental slope up to 900 meters in depth. In addition, they can be found in shallower waters in high salinity zones of bays and estuaries north of Cape Cod. Overall, juvenile's preference for benthic sediment types varies between sand, gravel, broken shells, pebbles, and soft mud (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is unlikely that thorny skates will be found within the project site as their preferable depths are deeper than those found within the project area. Therefore, no significant impact is expected to affect juvenile thorny skates.

White Hake (*Urophycis tenuis*): Juvenile and Adults, Project area; Larvae, Juvenile, Adult, RDS

Life History Information: Juvenile white hake inhabit intertidal and sub-tidal estuarine and marine habitats in the GOM which includes mixed and high salinity zones to a maximum of 300 meters. At different stages, juveniles will live in diverse areas, some will stay in pelagic waters while others will move to inshore benthic areas with fine-grained, sandy substrates in eelgrass, macroalgae, and un-vegetated habitats. Once this fish reaches adulthood, they will live in sub-

tidal, benthic habitats in the GOM, including certain mixed and high salinity portions of bays and estuaries at depths greater than 25 meters and between 100 and 400 meters in the outer gulf. In addition, adults rely on fine grained, muddy substrates, and mixed soft and rocky areas (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: It is possible for juvenile and adult white hake to occur within the project site as they will travel to intertidal and subtidal depths, respectively. However, as both life stages are motile, they can avoid the project area during periods of disturbance due to construction by moving to adjacent non-disturbed areas. The proposed project is not anticipated to permanently alter the characteristics of the subtidal benthic habitat. Therefore, no significant impacts to white hake and their associated EFH are expected due to the proposed project.

Windowpane Flounder (*Scophthalmus aquosus*): All Stages; All Locations

Life History Information: Windowpane Flounder is a mid and inner-shelf species found primarily between Georges Bank and Cape Hatteras on fine sandy sediment. Spawning begins in February and March in inner shelf waters, including many coastal bays and sounds, and on Georges Bank. In the Mid- Atlantic Bight, eggs and larvae are planktonic, found in waters less than 70 m deep from February- July and again in September- November. Juveniles and adults are distributed similarly, most often inhabiting intertidal and sub-tidal benthic habitats in estuarine, coastal marine, and continental shelf water in the GOM. They also both tend to prefer mixed and high salinity zones in bays and estuaries. Essential fish habitats for juvenile and adult windowpane consists of mud and sand substrates that extend from the intertidal zone to a maximum depth of 60 and 70 meters, respectfully (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: All life history stages may occur within the project area. If spawning does occur around the project area there is a low potential for adverse impacts to early life history stages as both larvae and eggs tend to occur closer to the surface than to the bottom. Construction activities that result in a temporary increase in turbidity may have an adverse impact on the windowpane because of this species' dependence on sight for foraging. This adverse effect is expected to be minimal as the impacts from the proposed project will be short term and localized. It is expected that juvenile and adults will avoid highly turbid conditions. Therefore, no significant impacts to windowpane flounder and their EFH are expected due to the proposed project.

Winter Flounder (*Pseudopleuronectes americanus*): All Stages; All Locations

Life History Information: EFH for all life stages of winter flounder is designated in Searsport Harbor and in the Gulf of Maine. Egg EFH is designated as subtidal estuarine and coastal benthic habitat from mean low water to five meters, while larval EFH is designated to a maximum depth of 70 meters. Essential habitats for winter flounder eggs include mud, muddy sand, sand, gravel, macroalgae, and submerged aquatic vegetation. Bottom habitats are unsuitable if exposed to excessive sedimentation which can reduce hatching success. Larval flounder EFH is considered estuarine, coastal, and continental shelf water column habitats from the shoreline to a maximum depth of 70 meters. Juvenile EFH extends from the intertidal zone to 60 meters and includes a variety of bottom types, such as mud, sand, rocky substrates with attached macroalgae, tidal wetlands, and eelgrass. Young-of-the-year juveniles are found inshore on muddy and sandy

sediments in and adjacent to eelgrass and macroalgae, in bottom debris, and in marsh creeks. They tend to settle to the bottom in soft-sediment depositional areas where currents concentrate late-stage larvae and disperse into coarser-grained substrates as they get older. Adult EFH is designated as estuarine, coastal, and continental shelf benthic habitats extending from the intertidal zone to a maximum depth of 70 meters. EFH for adult winter flounder occurs on muddy and sandy substrates and on hard bottom on offshore banks.

Occurrence in Project Area and Impacts: EFH for some stages of winter flounder may be temporarily impacted by the proposed project. Eggs and egg EFH are unlikely to be affected as the proposed maintenance dredging and CAD cell dredging will occur in waters deeper than 5 meters. The areas of the proposed project that are EFH for larval, juvenile, and adult winter flounder are expected to experience temporary impacts associated with sediment removal (elevated suspended sediments and loss of benthic fauna) and sediment placement (elevated suspended sediments and burial of benthic communities) should the CAD cell alternative be implemented. The effect on the water column EFH (increased turbidity) for flounder life stages at the dredge site and placement site will be short term and highly localized. Dredging and material placement will temporarily disturb benthic resources and flounder EFH. However, monitoring has shown that benthic recovery within dredge footprints and within placement sites can be expected (USACE 2017). Therefore, all impacts winter flounder or their associated EFH are expected to be short-term and localized to the immediate construction area.

Winter Skate (*Leucoraja ocellata*): Juveniles, Project Area

Life History Information: Winter skates are found over a wide range extending from southern New England and the Mid-Atlantic Bight (MAB) to North Carolina. They exhibit seasonal movements by moving offshore in the summer and near shore in the autumn. The preferred substrate of this species is sand and gravel bottoms although they have been documented in areas with mud bottoms. Winter skates are most active at nights and remain buried in depressions during the day. General depths at which they are found range slightly depending on the life history stage. Juveniles can be found from depths ranging from the shoreline to a maximum of 90 meters and adults can be found from the shoreline depths up to 80 meters. Additionally, essential fish habitat for juveniles includes any benthic area with sand, gravel, or mud substrates (NEFMC and NMFS, 2017).

Occurrence in Project Area and Impacts: Juvenile winter skates may occur within the project area during those periods in which they are expected to move inshore. As this life stage of the species is motile, they can avoid the area during periods of disturbance due to construction by moving to adjacent non-disturbed areas. The proposed project is not expected to change the habitat type at the dredging site or the proposed placement site. Therefore, no significant impacts to winter skates and their associated EFH are expected due to the proposed project.

4.3 Habitat Areas of Particular Concern

Atlantic Cod (*Gadus morhua*) – - The inshore areas of the Gulf of Maine and Southern New England between 0-20 meters are designated as HAPC for juvenile cod. The coastal areas of the Gulf of Maine and Southern New England contain structurally complex rocky-bottom habitat that supports a wide variety of emergent epifauna and benthic invertebrates. Although this habitat type

is not rare in the coastal Gulf of Maine, it provides two key ecological functions for juvenile cod: protection from predation, and readily available prey.

Occurrence in Project Area and Impacts: The Searsport Harbor FNP and the proposed CAD cell location do not contain substrates that are considered habitat of particular concern (HAPC) for inshore juvenile cod. The subtidal bottoms of the FNP and proposed CAD cell are composed of fine sand and silt and are not structurally complex. The bottom sediment type following the maintenance dredging effort will remain the same. Therefore, no impacts to cod HAPC are anticipated.

Atlantic Salmon (*Salmo salar*): Coastal Areas HAPC for all three life stages is generally characterized by salinities below 25 ppt. Transit habitats utilized during upstream and downstream migration include streams, rivers, and estuaries from 1st to 5th order, as well as coastal marine areas adjacent to the mouths of designated rivers and estuaries within state waters (3 miles).

Occurrence in Project Area and Impacts: The Searsport Harbor FNP, proposed CAD cell locations and RDS are considered HAPC because Atlantic salmon need to transit them to get to and from their natal rivers. The relatively small footprint of the project areas found in Penobscot Bay will have little impact on transiting salmon as they have many possible routes to take to avoid possible project turbidity on their migratory runs. Therefore, no impacts to Atlantic salmon HAPC are anticipated.

5.0 Impact Assessment

The maintenance dredging of the Searsport Harbor Federal Navigation Project, the creation of Searsport Harbor CAD cells, and the associated placement of dredged material in the CADs cells or RDS are not anticipated to have significant effects or long-term lasting effects on the “spawning, breeding, feeding, or growth to maturity” of the majority of managed species that have EFH within the project areas.

The proposed activities will have immediate, short-term, direct impacts on EFH for some of the managed fish species and life history stages that occur in the immediate vicinity of the project area and disposal area. This section identifies reasonably foreseeable effects that could result from the proposed project.

5.1 Direct and Indirect Impacts

Dredging and Disposal

The proposed project would impact fish species in the project area. Effects of the proposed project include possible death and injury of fish, interference with fish movements, disruption of the forage base, and minor changes in water quality during dredging and disposal operations. Direct removal of soft bottom habitats will occur in the dredging areas and direct covering of soft bottom habitats may occur in the CAD cell and disposal area. Impacts to water quality will occur, however they are anticipated to be short-term and localized to within hundreds of feet of the dredging and disposal efforts.

Intermittent, short-term impacts to fish also include disturbance of fish throughout the water column within the localized area during dredging and disposal efforts. Due to their mobility, most fish would be expected to move out of an active dredging area, CAD cell or disposal area. The sediment plume associated with dredging and the plume following material placement would also have potential short-term water quality impacts that may also have indirect impacts on fish by temporarily altering certain finfish behaviors, such as migration, spawning, foraging, schooling, and predator evasion (O'Connor, 1991). Increased turbidity has also been associated with potential gill abrasion and respiratory damage (Saila, et al. (1971); Wilber & Clark (2001)).

Sediment characteristics and the life stage of species affect how sensitive species are to suspended sediment, with egg and larval stages tending to be the most sensitive (Johnson, et al., (2008); Berry et al. (2003), Wilber & Clark (2001)). During material placement, these impacts are limited both in duration and spatially due to the short time needed for dredged material to reach the bottom (Kraus (1991); Dragos & Lewis (1993); Dragos & Peven (1994)). Saila, et al. (1971) also point out that “aquatic animals are able to tolerate high concentrations of suspended sediments for short periods.” Since the tolerance level for suspended solids is high in shallow and mid-depth coastal waters, and fish may experience major changes in turbidity during storms, Saila, et al. (1971) conclude that mortality due to elevated sediment concentrations in the water column resulting from dredged material placement is not likely.

Concentrations of sediments and the duration needed to cause impacts to fish resources are

expected to be short-term and localized and as such, effects to fish sources and EFH in the proposed project areas should be minimal.

5.2 Cumulative Impacts

Cumulative impacts are those resulting from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. Past actions in association with the Searsport Harbor FNP include the construction of the FNP in Searsport Harbor as well as the construction of bulkheads and seawalls along the harbor, filling of salt marsh and deforestation of forested uplands for residential and commercial development, the development of a commercial shipping port; commercial and recreational navigation; and commercial fishing in the harbor.

There are no concurrent Federal or State projects being constructed in the project area or projects slated to occur in the near future. Reasonably foreseeable future actions include the continuation of maintenance of the FNP as needed as well as the majority of the activities described above. The effects of these previous and existing actions are generally limited to infrequent disturbances of the benthic communities and occasional impacts to water quality. Air quality, hydrology, and other biological resources are generally not significantly affected by these actions. The direct effects of this project are not anticipated to add to impacts from other actions in the area. Therefore, no significant cumulative impacts to EFH or EFH species are expected as a result of implementing the proposed action.

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