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US ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
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Programs and Project Management Division
Civil Works/IIS Project Management Branch
Navigation Section

Ms. Jennifer Anderson
Protected Resources Division
National Marine Fisheries Service
55 Great Republic Drive
Gloucester, Massachusetts 01930

Dear Ms. Anderson:

This letter is to request Endangered Species Act (ESA) concurrence for maintenance dredging of the Rye Harbor Federal Navigation Project (FNP) in Rye, New Hampshire (Figure 1). We have made the determination that the proposed activity may affect, but is not likely to adversely affect, any species listed as threatened or endangered by NMFS under the ESA of 1973, as amended. Our supporting analysis is provided below.

1. Proposed Project

The U.S. Army Corps of Engineers (USACE) is proposing to dredge approximately 50,000 cubic yards of silt and fine-sand from the Rye Harbor Federal navigation channel and associated anchorage to maintain their required depths (Figure 1). Dredged material will be placed at one of two open-water placement sites; Isles of Shoals North Disposal Site (IOSN) or Cape Arundel Disposal Site (CADS) (Figures 2 & 3).

The authorized FNP provides for a100-foot wide, 10-foot deep navigation channel (at mean lower low water (MLLW)) extending 600 feet through the entrance and then 8 feet deep for 1,700 feet to the State pier in the inner harbor. There is also a 5 acre, 6-foot deep (MLLW) anchorage to the north of the 8 foot channel and an 8 foot deep (MLLW) anchorage of the same size, located to the south of the channel. There are two jetties, approximately 500 feet in length, situated perpendicular to the navigation channel to the north and south of the harbor entrance, protecting the harbor from open ocean waves.

Congress has authorized the USACE to maintain the Rye Harbor FNP to ensure shoaling does not present a hazard to vessels navigating the harbor. Recent hydrographic surveys have shown that shoaling has occurred within the Rye Harbor FNP to an extent which presents a hazard to vessel navigation, making them

susceptible to groundings and exposure to hazardous conditions when tides and weather create rough seas.

The proposed dredging will be performed by a private contractor utilizing a mechanical bucket dredge with scows under contract to the government. The project is expected to take one to three months to accomplish within an established dredge window of November 15 to March 15, of the year(s) in which funds become available (likely to start dredging November 2020).

Dredged material will be placed at either the IOSN or CADS open-water placement sites. No upland disposal locations or beneficial use sites were identified that could receive the material including beach nourishment or nearshore placement given the physical characteristics of the dredge material. The CADS is approximately 22 nautical miles northeast of Rye Harbor and IOSN is approximately 12.5 nautical miles east of the harbor. CADS has been used as an open-water disposal site for dredging projects occurring in New Hampshire and southern Maine, and is regularly monitored by the Corps' Disposal Area Monitoring System (DAMOS) Program (Hickey et al. 2013). IOSN is a newly proposed placement area that is currently being evaluated for U.S. Environmental Protection Agency (EPA) designation under Section 103(b) of the Marine Protection, Research and Sanctuaries Act (MPRSA). The proposed IOSN site is the preferred open-water disposal site provided the required approvals are in place given its shorter haul distance (approximately 9.5 nautical miles) which would minimize the distance that a scow would travel to and from the proposed offshore placement site. The home port of the scow and support vessels are unknown at this time.

2. Special Conditions for Disposal at IOSN or CADS

The following conditions will be implemented for the proposed project to reduce adverse impacts to NMFS listed threatened or endangered species:

1. A NMFS approved marine mammal/turtle observer (http://www.fisheries.noaa.gov/new-england-mid-atlantic/careers-and-opportunities/protected-species-observers), must be present aboard disposal vessels for all transportation and disposal activities. The name of the observer must be recorded in the logbook and is required to be on lookout for marine mammals and sea turtles for the duration of the trip.

2. The approved observer shall:
    a. Contact https://portal.nrwbuoys.org/ab/dash/ or www.nefsc.noaa.gov/psb/surveys before the initial disposal operation to determine the potential presence of whales in the area; and
    b. Report whale and sea turtle sightings as soon as possible (within 24-hours) to the NMFS Marine Animal Response Hotline at (866) 755-NOAA; and

c. Report any interactions with listed species as soon as possible (within 24-hours) to the NMFS Marine Animal Response Hotline at (866) 755-NOAA
d. or USCG via CH-16 and immediately report any injured or dead marine mammals or sea turtles to NMFS at (866) 755-NOAA.

3. Disposal vessels including tugs, barges, and scows transiting between the dredge site and the disposal site shall operate at speeds not to exceed 10 knots. For unanticipated conditions, a vessel may operate at a speed necessary to maintain safe maneuvering speed instead of the required 10 knots. The intent of this condition is to reduce the potential for vessel collisions with endangered turtles and fish.

4. At the end of the disposal operations, a report will be submitted by email to both cenae-nav@usace.army.mil (USACE) and incidental.take@noaa.gov (NMFS), summarizing the vessel route taken, number of trips, sightings of ESA-listed species, and any action taken to avoid interactions with ESA-listed species.

Figure 1. Areas to be dredged at Rye Harbor FNP.

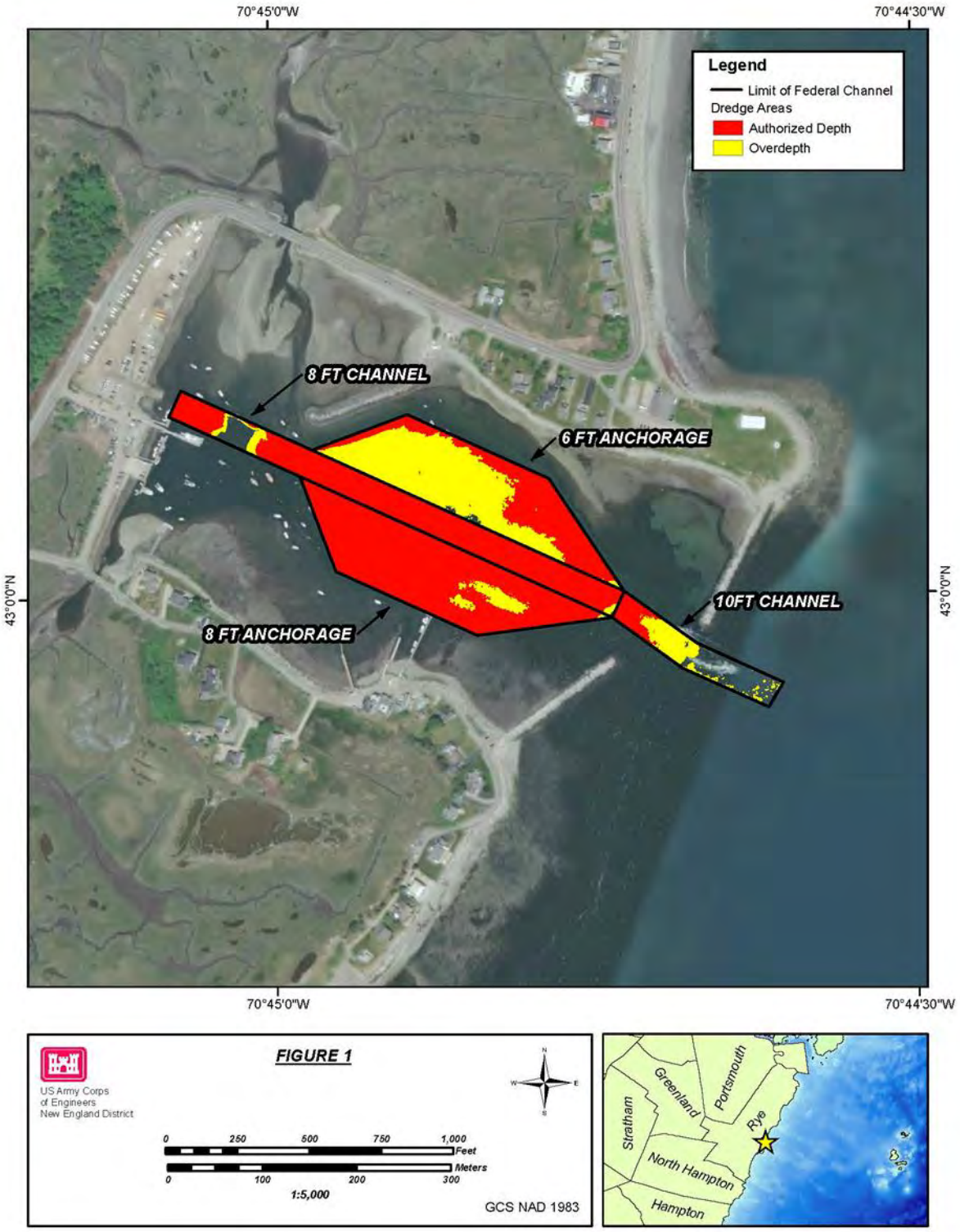


Figure 2. Map of Cape Arundel Disposal Site with scow haul distance from Rye Harbor.

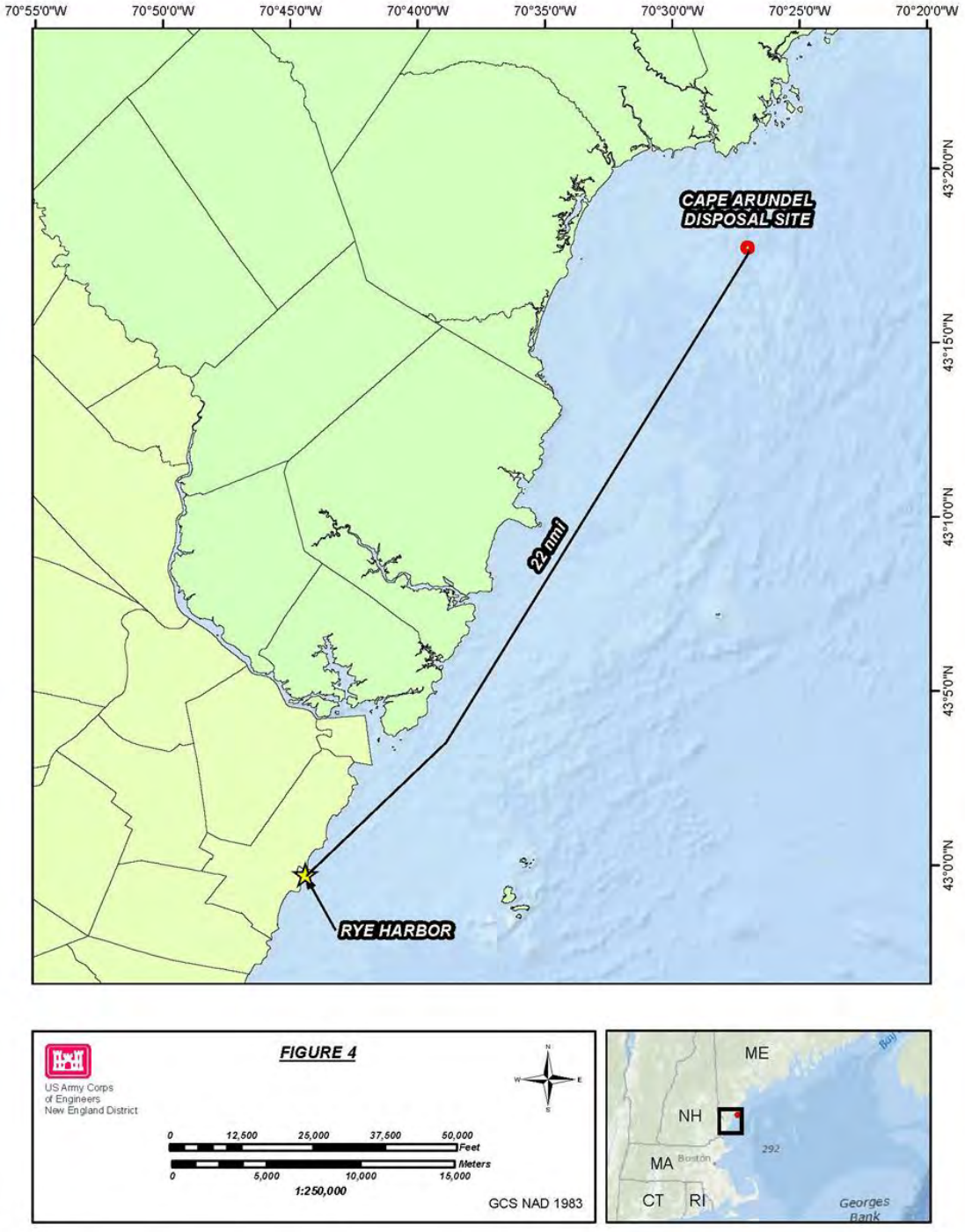
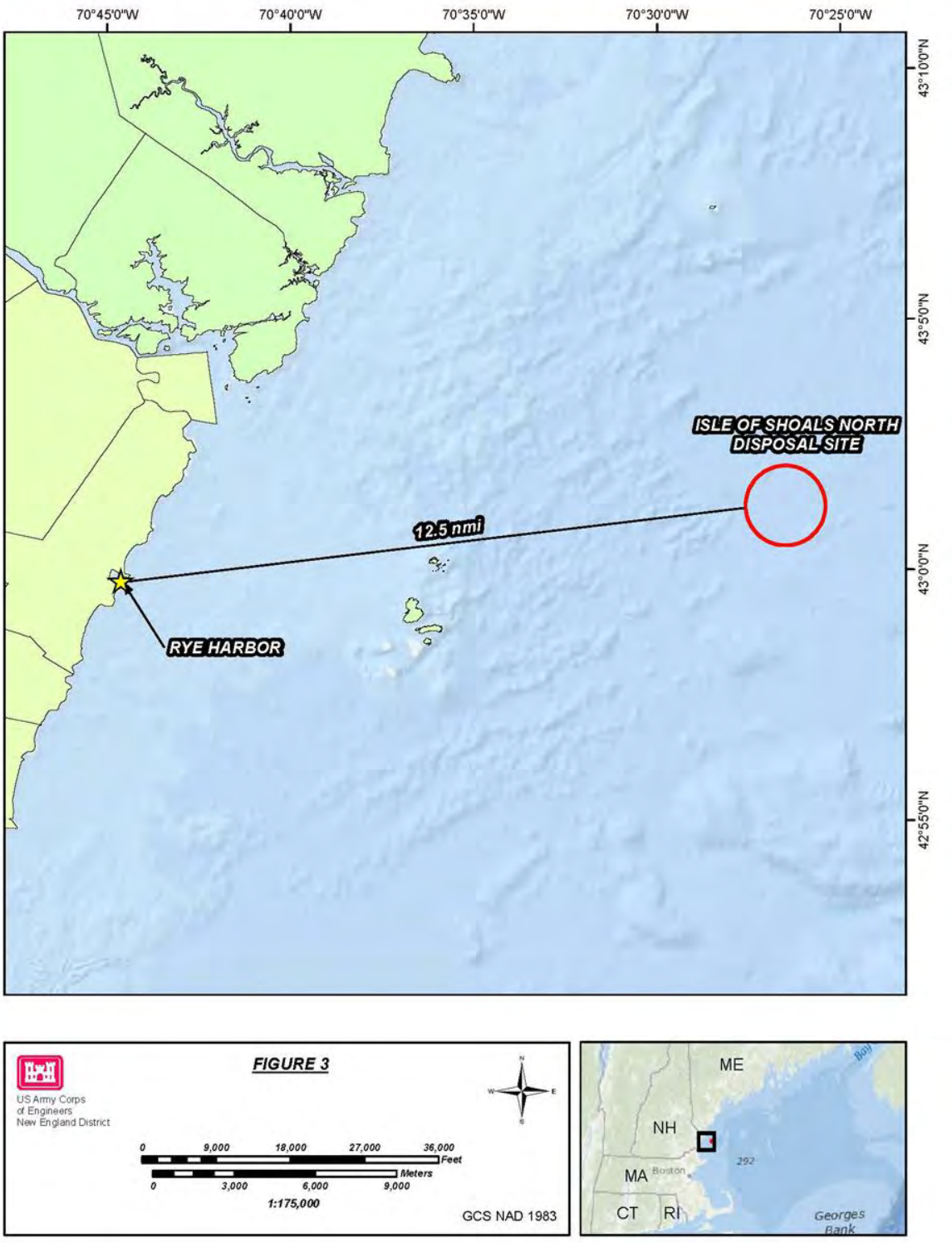


Figure 3. Map of Island of Shoals North Disposal Site with scow haul distance from Rye Harbor.



3. Description of the Action Area

The action area is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action” (50CFR§402.02). The action area for this project consists of the maintenance dredging areas designated at the Rye Harbor FNP (5 acres), the turbidity plume from the mechanical dredge (approx. 2,000 foot radius around dredging activity), the dredge material placement footprint (approx. 3 acres; 6,500 foot radius from disposal location) resulting from the placement of material at either CADS or IOSN, and all routes travelled by the project vessels. The locations of the action areas include the Rye Harbor FNP (43°04.101’N, -70°44.505’W) and the dredge material placement locations at CADS (43°17.800' N, -70°27.200' W) and IOSN (43°1.309' N, -70°26.687' W). This area is expected to encompass all of the effects of the proposed project.

Rye Harbor FNP

The Rye Harbor FNP resides in the town of Rye, New Hampshire which covers a total area of 36.7 square miles. The town is located on the shore of the Atlantic Ocean and includes four of the nine islands known as the Isles of Shoals, which lie approximately 10 miles out from the mainland. Rye Harbor is a small (40 acre) estuarine embayment located approximately five miles south of Portsmouth Harbor and thirteen miles north of the Merrimack River (Figure 1). The harbor is protected from the open ocean by two breakwaters which were constructed by the State of New Hampshire. The harbor is home to a small recreational and commercial fishing fleet. There is a commercial fishing pier and a boat ramp in the inner harbor that serves as a recreational boat launch.

Land use surrounding Rye Harbor is predominately open space, recreational, and residential. The State of New Hampshire maintains a boat ramp at the terminus of the FNP channel with a gravel parking lot and seasonal support facilities. Rye Harbor is largely surrounded by estuarine salt-marsh with tributaries connecting to the harbor to the north and south of the Federal channel. Rye Harbor State Park and Awcomin Swamp, a 150-acre salt marsh, are located to the north of the harbor. To the south is a 40-acre salt marsh, which is largely separated from the harbor by an area of upland that is residentially developed. There are no current wetland resources within the extent of the harbor itself or within the proposed dredge footprint which is entirely subtidal. There are also no current or historical eelgrass beds (*Zostera marina*) documented within the extent of the harbor or within the proposed dredge footprint.

Freshwater input into Rye Harbor occurs through the estuarine embayment to the north and the tidal streams that feed Rye Harbor that drain from the tidal salt marsh. The mean tidal range of the harbor is approximately 8.6 feet and the mean spring tide range is 9.4 feet. The State of New Hampshire Watershed Report Cards classifies Rye Harbor, and the adjacent salt marsh tributaries, as Category 5-M (“Poor” or impaired conditions) for fish consumption and shellfishing (NHDES, 2015). Category 5-M waters

are impaired for parameters that requires a Total Maximum Daily Load (TMDL) but the impairment is considered marginal. For Rye Harbor, fish consumption and shellfishing are considered impaired due to moderate concentrations of mercury, polychlorinated biphenyls (PCBs), and dioxin (NHDES, 2015). The other water quality categories for Rye Harbor were in good condition or had inadequate data to determine a rating (NHDES, 2015).

Rye Harbor supports a typical productive nearshore fish assemblage. The likely dominant species that occur in Rye Harbor included yellowtail flounder (*Limanda ferruginea*), longhorn sculpin (*Myoxocephalus octodecemspinosus*), hake (*Urophycis spp.*), and winter flounder (Pseudopleuronectes americanus). The dominant pelagic species likely include Atlantic herring (*Clupea harengus*), Atlantic whiting (*Merluccius bilinearis*), pollock (*Pollachius virens*), and Atlantic mackerel (*Scomber scombrus*).

In July 2015, the USACE conducted a benthic sampling survey within the Rye Harbor FNP to characterize the benthic community within the dredge footprint. All stations displayed a moderate diversity of species and number of organisms present with the community being represented by a mix of annelid worms, bivalves, and amphipods. This observed benthic community is characteristic of typical mid-successional stage, near-shore, silt-sand assemblage. According to NHDES shellfish maps American oyster (*Crassostrea virginica*), blue mussel (*Mytilus edulis*), razor clam (*Siliqua patula*), surf clam (*Spisula solidissima*), mahogany quahog (*Arctica islandica*), and softshell clam (*Mya arenaria*), are not permitted to be harvested within Rye Harbor, however, these species are permitted for harvest outside the harbor and along the New Hampshire coast.

The material to be dredged from the FNP ranges from fine sand in the outer entrance channel to silt near the boat launch. Bulk chemistry and biological testing was performed on the sediments in 2015. Based on the testing and evaluation requirements set forth in Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), the sediments to be dredged from the Rye Harbor FNP are considered suitable for unconfined open water disposal at CADS and IOSN. Separate suitability determinations for CADS and IOSN were confirmed by the U.S. Environmental Protection Agency (USEPA) and the State of Maine Department of Environmental Protection (MEDEP) (USACE, 2016; USACE, 2017).

Disposal Locations

Cape Arundel Disposal Site (CADS)

The Cape Arundel Disposal Site is a 1,500 foot diameter circle, centered at 43°17.800' N, -70°27.200' W (NAD 83) in the Atlantic Ocean 2.75 nautical miles southeast of Cape Arundel, Maine (Figure 2). Water depths at CADS vary from 98 feet to 138 feet with complex topography. The CADS bottom topography is characterized by a north-south trending trough running 0.6 miles in length and 165 to 820 feet wide. This trough has a maximum depth of 141 feet and a silt/clay bottom mixed with fine sand. It

is flanked by hard rock ridges shoaling up to 98 to 105 feet in depth (SAIC, 1991). DAMOS studies have shown that the depth and configuration of the site allows it to function as a containment site, i.e., material placed at the site is not expected to be resuspended and transported (Hickey, et al., 2014).

The 2013 DAMOS benthic survey of CADS identified soft sediment stations within CADS with abundant evidence of bioturbation including visible polychaetes, feeding voids and burrows. Stations on harder bottom were more variable but had abundant evidence of biological activity (encrusting animals, tracks and trails, tubes and burrows in crevices. Analysis of SPI/PV results found no adverse ecological effects from dredged material placement activities within CADS with indications of a robust benthic community throughout the study area (Hickey, et al., 2014). American lobsters (*Homarus americanus*) are actively fished in and around CADS.

Isles of Shoals North Disposal Site (IOSN)

Isles of Shoals North Disposal Site is an approximately 10,000 foot diameter circle, centered at 43°1.309' N, -70°26.687' W (NAD 83) in the Gulf of Maine, approximately 10.8 nautical miles east of Portsmouth, New Hampshire. Water depths at IOSN vary from 255 feet to 340 feet and gradually slope from approximately 295 feet on the western boundary to 328 feet in the southeastern portion of the site. The site covers a shallow basin area bounded by a slope to higher ground on the west and by small ridges to the north and southeast, leaving a deeper area in the central and east areas of the site. This topography, and the significant depth of the site (about 300 feet) would allow for long term containment of material placed there (Guarinello, et al.,2016; EPA, 2019).

The results of the benthic community analysis indicate that, while not extremely diverse, the macroinvertebrate fauna at the IOSN shows a mix of short-lived opportunistic species and longer-living stable climax community species. The benthic community samples consisted of 40 species representing four phyla. The assemblage is noteworthy for its lack of oligochaetes, nearly ubiquitous elsewhere, and the absence of echinoderms and colonial species. Polychaetes were the overwhelmingly dominating taxa within the community in terms of numbers of species and individuals. Density was relatively low, while the species richness, diversity and evenness were also at low to moderate levels. One species, the polychaete *Paraonis gracilis*, was the numerical dominant at eight of the nine stations sampled (Battelle, 2016).

4. ESA Listed Species and Critical Habitat Found in Action Area

The federally listed threatened or endangered species (and/or their critical habitat) present in or near the proposed dredging and disposal areas are listed below. These species are described further in the following sections.

Sea Turtles

Kemp's Ridley Turtle (*Lepidochelys kempii*) (35 FR 18319; Recovery plan: NMFS et al. 2011)
Leatherback Turtle (*Dermochelys coriacea*) (35 FR 8491; Recovery plan: NMFS & USFWS 1992)
Loggerhead Turtle (*Caretta caretta*)(76 FR 58868; Recovery plan: NMFS & USFWS 2008)
Green Turtle (*Chelonia mydas*)(81 FR 20057; Recovery plan: NMFS & USFWS 1991)

Fish
Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*)(77 FR 5880 and 77 FR 5914)
Shortnose Sturgeon (*Acipenser brevirostrum*)(32 FR 4001; Recovery plan: NMFS 1998)
Atlantic salmon (*Salmo salar*)(74 FR 29344; Recovery plan: NMFS & USFWS 2019)

Whales
North Atlantic Right Whale *(Eubalaena glacialis)*(73 FR 12024; Recovery Plan: NMFS 2005)
Fin Whale (*Balaenoptera physalus*)(35 FR 18319; Recovery Plan: NMFS 2010)

Critical Habitat
North Atlantic Right Whale (81 FR 4837)
Designated Atlantic salmon and Atlantic sturgeon critical habitats are not present in the action area.

Sea Turtles

Four species of federally listed threatened or endangered sea turtles are found seasonally in the coastal waters of New Hampshire and Maine, including the action area. These species are the threatened North Atlantic distinct population segment (DPS) of green (*Chelonia mydas*) and Northwest Atlantic Ocean DPS of loggerhead (*Caretta caretta*), and the endangered Kemp's ridley (*Lepidochelys kempi*), and leatherback (*Dermochelys coriacea*) sea turtles.

In general, listed sea turtles are seasonally distributed in coastal U.S. Atlantic waters, migrating to and from habitats extending from Florida to New England, with overwintering concentrations in southern waters. As water temperatures rise in the spring, these turtles begin to migrate northward. As temperatures decline rapidly in the fall, turtles in northern waters begin their southward migration. Sea turtles are expected to be in the vicinity of the action area in warmer months, typically when water temperatures are at least 15°C. This generally coincides with the months of May through November, with the highest concentration of sea turtles present from June through October (Shoop and Kenney 1992; Morreale and Standora 2005). Outside of these times, sea turtle presence in the region's waters is considered unlikely aside from cold-stunned individuals that fail to migrate south.

The majority of these species are pelagic (open ocean) animals; however, they are common in the shallow, coastal areas in the summer when they forage for food.

Kemp's ridleys rarely venture into waters deeper than 160 ft (Byles and Plotkin, 1994). We are unaware of any sea turtle studies that focus on the action area (dredge area, disposal sites, and transit routes) and therefore provide an estimate of the depth at which they typically occur in coastal waters. Studies of sea turtles near Long Island, New York have shown that these species typically occur in waters with depths between 16 and 49 feet deep and in areas where the waters are slow-moving or still (i.e., less than 2 knots) to forage (Ruben and Morreale, 1999). Thus, based on the best available information, we assume their preferred foraging depth is between 16 and 49 feet deep.

Based on these species' preferred coastal foraging habitat and the time of year for the project, they are expected to be in the action area opportunistically foraging. Transient sea turtles could be present in the dredging site as well as along the transit routes to CADS and IOSN during the month of November. Due to the depths present at CADS (98-138 feet) and IOSN (300 feet), we do not expect sea turtles to be foraging in those areas.

Atlantic Sturgeon

There are five distinct population segments (DPS) of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) listed as threatened or endangered (77 FR 5880 and 77 FR 5914). Atlantic sturgeon originating from the New York Bight, Chesapeake Bay, South Atlantic and Carolina DPSs are listed as endangered; the Gulf of Maine DPS is listed as threatened. The marine range of all five DPSs extends along the Atlantic coast from Canada to Cape Canaveral, Florida and includes the project areas. In close proximity to the project area are the Merrimack River (approximately 13 miles) and the Piscataqua River (approximately 6 miles), which are both designated as critical habitat for Atlantic sturgeon and potential spawning locations for the species.

Atlantic sturgeon are anadromous, meaning that adults spawn in freshwater portions of large rivers in the spring and early summer and migrate into estuarine and marine waters where they spend most of their lives. In some southern rivers a fall spawning migration may also occur. They spawn in moderately flowing water (46-76 cm/s) in deep parts of large rivers. Sturgeon eggs are highly adhesive and are deposited on bottom substrate, usually on hard surfaces (e.g., cobble). It is likely that cold, clean water is important for proper larval development. Once larvae begin migrating downstream they use benthic structure (especially gravel matrices) as refuges. Early life stages are not tolerant of salinity; therefore spawning, egg, and early life stages will not occur at CADS, IOSN, or within Rye Harbor.

Juveniles usually reside in estuarine waters for months to years. Because the harbor and disposal sites are not located in a river where sturgeon spawn, no juveniles will be present at either site as this life stage remains in the natal river. Subadults and adults live in coastal waters and estuaries when not spawning, generally in shallow (32-164 ft depth) nearshore areas dominated by gravel and sand substrates. Long distance migrations away from spawning rivers are common. Atlantic sturgeon also occur over shallow (8 ft), tidally influenced flats and mud, sand, and mixed cobble

substrates (Savoy and Pacileo, 2003). Occurrence in these shallow waters is thought to be tied to the presence of benthic resources for foraging.

No known estimates of the number of Atlantic sturgeon present in the action area are available. Foraging habitat is present within all project sites and benthic resources that may be used by foraging adult and sub-adult sturgeon will be impacted by the project. Atlantic sturgeon could be present at any time of the year. We expect the presence of Atlantic sturgeon in the vicinity of the project locations and transit routes to be limited to occasional transient sub-adults or adults originating from any of the five DPSs during the November 15 to March 15 work window.

Shortnose Sturgeon

Short-nose sturgeon (*Acipenser brevirostrum*) (32 FR 4001; Recovery plan: NMFS 1998) are federally endangered throughout their range. The species has been documented in the coastal rivers along the East Coast of North America from the Saint John River in New Brunswick, Canada, to the St. Johns River in Florida, and have the potential to occur in Rye Harbor. Similar to Atlantic sturgeon, short-nose sturgeon spawn in large freshwater rivers and persist within their natal rivers for months to years as juveniles. Movements of individuals between river systems has been documented but is limited to very few individuals per generation. Shortnose sturgeon are benthic feeders, eating crustaceans, mollusks, and insects.

Studies suggest that short-nose sturgeon utilize the Piscataqua River for foraging and the Merrimack River to spawn and as an overwintering area (NMFS, 1998). Since Rye Harbor is not associated with a freshwater riverine system, spawning shortnose sturgeon and early life stages would not be present in the dredge or disposal location. Therefore, any presence of short-nose sturgeon in the action area is likely to be migrating adults that are opportunistically foraging outside their natal river habitat. To date, little data exists on the presence or absence of shortnose sturgeon or the extent of their population in coastal New England harbors, including Rye Harbor.

Atlantic Salmon

The Gulf of Maine (GOM) distinct population segment (DPS) of Atlantic salmon (*Salmo salar*) is listed as federally endangered throughout their range. This species primarily utilizes riverine habitats in Maine for spawning and juvenile development, for which critical habitat is designated for the GOM DPS. Atlantic salmon's freshwater range occurs in the watersheds from the Androscoggin River northward along the Maine coast to the Dennys River (NMFS, 1998). The marine range of the GOM DPS extends from the Gulf of Maine, throughout the Northwest Atlantic Ocean, to the coast of Greenland; included in the GOM DPS are all associated conservation hatchery populations used to supplement the natural populations. This species is highly migratory, undertaking long marine migrations from their natal rivers where they are distributed seasonally over much of the region. The marine phase starts with the

completion of smoltification and migration through the estuary of the natal river (NMFS, 1998).

While the action area is outside of the Gulf of Maine DPS, due to the counter currents in the Gulf of Maine, salmon smolts may be present in late spring – early summer. Given that all work will be completed between November and March, Atlantic salmon will not be present in the action area and will not be exposed to any effects of the action. Therefore, this species will not be considered further in this analysis.

Whales

Federally endangered North Atlantic right whales (*Eubalaena glacialis*) and fin whales (*Balaenoptera physalus*) are found seasonally in Maine waters. Both of these species may be present at IOSN and along the scow transit route from Rye Harbor during disposal operations.

The North Atlantic right whale is one of the world's most endangered large whales. Over-exploitation by commercial whalers in the 19th and early 20th centuries reduced the population to a fraction of its original size. Although killing right whales has been prohibited since the 1930's, the population has not increased to any appreciable degree. Threats to the low population of roughly 300-400 individuals include ship strikes and entanglement in fishing nets. In 2017, the species experienced an unusual mortality event when seventeen right whales were found dead off the coasts of New England and Canada. The seasonal presence of right whales is thought to be closely associated to the seasonal presence of dense patches of their preferred copepod prey (primarily *Calanus finmarchus* but also *Pseudocalanus* spp. and *Centropages* spp. (Pace and Merrick, 2008). The nearshore areas of importance are Cape Cod Bay, Massachusetts Bay, Great South Channel, western Gulf of Maine, Georges Bank, Jordan Basin, Wilkinson Basin, Jeffrey's Ledge and Cashes Ledge. While potentially present year-round, these whales are mostly likely to forage in Cape Cod Bay (January - April), Massachusetts Bay (January - April), Great South Channel (April - June), the western Gulf of Maine (April - May and July -October), the northern edge of Georges Bank (May - July), Jordan Basin (August - October), and Wilkinson Basin (April - July). Increasing evidence of wintering areas (approximately November - January) are in Cape Cod Bay, Jeffrey's and Cashes Ledge, Jordan Basin, and Massachusetts Bay (e.g., Stellwagen Bank).

Fin whales found off the eastern United States are centered along the 328 foot isobaths; however, sightings are spread out over shallower and deeper water, with their summer feeding range occurring mainly between 41°N and 51°N, from shore seaward to the 6,000 foot contour (NMFS, 2010; Kenney and Winn, 1987; Hain et al., 1992). Fin whales have the greatest likelihood of occurrence in the waters of Maine feeding in coastal areas along the 130 to 165 ft depth contour and therefore can occur in the vicinity of the IOSN. They forage in the greatest densities from March-August and lower densities from September-November. Important foraging grounds include Massachusetts Bay (especially Stellwagen Bank), Great South Channel, waters off

Cape Cod (~130-165 foot contour), the western Gulf of Maine (especially Jeffrey's Ledge), and the eastern perimeter of Georges Bank. Evidence of wintering areas are in Stellwagen Bank and the eastern perimeter of Georges Bank.

We are not aware of any reported sightings of whales in the vicinity of Rye Harbor or the CADS and do not expect right or fin whales to be present in the dredge footprint or the CADS given the depths present. Whales may be present along the vessel transit routes as well as the IOSN during the work window.

North Atlantic Right Whale Critical Habitat

The IOSN is located within designated North Atlantic right whale critical habitat (NARW CH) of the Northeastern foraging area. The CADS is approximately 0.6 miles to the west, outside of the NAEW CH. Critical habitat is defined by section 3 of the ESA as "(1) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species (NMFS 2016)."

The final rule (81 FR 4873) identifies the following four physical and biological features (PBFs) of foraging habitat that are essential to the conservation of the species: (1) The physical oceanographic conditions and structures of the Gulf of Maine and Georges Bank region that combine to distribute and aggregate a species of copepod (*Calanus finmarchicus*) for right whale foraging, namely prevailing currents and circulation patterns, bathymetric features (basins, banks, and channels), oceanic fronts, density gradients, and temperature regimes; (2) Low flow velocities in Jordan, Wilkinson, and Georges Basins that allow developing *C. finmarchicus* to aggregate; (3) Late stage *C. finmarchicus* in dense aggregations in the Gulf of Maine and Georges Bank region; and (4) Diapausing *C. finmarchicus* in aggregations in the Gulf of Maine and Georges Bank region.

IOSN is within designated critical habitat for North Atlantic Right Whales. Of the four physical and biological features described above, one may occur within the action area; PBF 3: an aggregation of the copepod (*Calanus finmarchicus*) in the Gulf of Maine and Georges Bank region.

5. Effects Determination

Dredge Entrapment

Mechanical dredging entails lowering the open bucket or clamshell through the water column, closing the bucket after impact on the bottom, lifting the bucket up through the water column, and emptying the bucket into a barge or truck. The bucket operates without suction or hydraulic intake, moves relatively slowly through the water

column, and impacts only a small area of the aquatic bottom at any time. In order to be captured in a dredge bucket, an animal must be on the bottom directly below the dredge bucket as it impacts the substrate and remain stationary as the bucket closes. Species captured in dredge buckets can be injured or killed if entrapped in the bucket or buried in sediment during dredging and/or when sediment is deposited into the dredge scow. Species captured and emptied out of the bucket can suffer stress or injury, which can lead to mortality.

Sea Turtles

Sea turtles are not known to be vulnerable to entrapment in mechanical dredges, presumably because they are able to avoid the dredge bucket. Thus, if a sea turtle were to be present at the dredge site, it would be extremely unlikely to be injured or killed as a result of dredging operations carried out by a mechanical dredge. Based on this, effects to sea turtles from the mechanical dredge are discountable.

Sturgeon

In 2012, the Corps provided NMFS with a list of all documented interactions between dredges and sturgeon reported along the U.S. East Coast, reports dated as far back as 1990 (USACE, 2012). This list included four incidents of sturgeon captured in dredge buckets. These include the capture of a decomposed Atlantic sturgeon in Wilmington Harbor in 2001. The condition of this fish indicated it was not killed during the dredging operation and was likely dead on the bottom or in the water column and merely scooped up by the dredge bucket. Another record was of the capture of an Atlantic sturgeon in Wilmington Harbor in 1998; however, this record is not verified and not considered reliable. The report also listed the live capture of an Atlantic sturgeon at the Bath Iron Works (BIW) facility in the Kennebec River, Maine in 2001 as well as a shortnose sturgeon captured at BIW in 2003 that was observed to have suffered death recently at the time of capture. One report of a live shortnose sturgeon captured in a dredge bucket at BIW in 2009 was not included in the report. Similarly, a shortnose sturgeon fatality at BIW in 2017 was not reported (suspected to be attributable to a cutterhead dredge). Observer coverage at dredging operations at the BIW facility has been 100% for approximately 15 years, with dredging occurring every one to two years. Hundreds of mechanical dredging projects occur along the U.S. Atlantic coast each year and we are not aware of any other captures of sturgeon in mechanical dredges anywhere in the U.S prior to or after 2012.

The risk of interactions between sturgeon and mechanical dredges is thought to be highest in areas where large numbers of sturgeon are known to aggregate. The risk of capture may also be related to the behavior of the sturgeon in the area. While foraging, sturgeon are at the bottom of the river interacting with the sediment. This behavior may increase the susceptibility of capture with a dredge bucket. We also expect the risk of capture to be higher in areas where sturgeon are overwintering and spawning in dense aggregations as overwintering and spawning sturgeon may be less responsive to stimuli which could reduce the potential for a sturgeon to avoid an oncoming dredge bucket.

Based on all available evidence, the risk of sturgeon being captured in a mechanical dredge in the Rye Harbor FNP is low. This is based on the fact that the action area is not known to support high densities of spawning or overwintering sturgeon. Therefore, it is extremely unlikely that any sturgeon will be captured, injured or killed during mechanical dredging activities, thus, any effects of entrapment from the proposed dredging activities on sturgeon are discountable.

Turbidity from Dredging and Dredged Material Disposal

Mechanical dredging will disturb sediments and cause a temporary increase in suspended sediment within the action area. Resuspension of sediments is generally due to the dynamic impact of the bucket on the channel bottom, the spillage and leakage from the filled bucket as it is being elevated from the bottom, and the washing action of the empty bucket falling through the water column (Hayes, 1986; LaSalle, 1988). Within the harbor, turbidity is expected to remain localized to the dredge area.

Several studies have monitored sediment plumes associated with dredging projects along the Atlantic Coast. Suspended sediment levels from conventional mechanical clamshell bucket dredging operations have been shown to range from 105 mg/L in the middle of the water column to 445 mg/L near the bottom (210 mg/L, depth-averaged) (USACE, 2001). A study by Burton (1993) measured turbidity levels 500, 1,000, 2,000 and 3,300 feet from dredge sites in the Delaware River and was able to detect turbidity levels between 15 mg/L and 191 mg/L up to 2,000 feet from the dredge site. In support of the New York/New Jersey Harbor Deepening Project, the Corps conducted extensive monitoring of mechanical dredge plumes (ACOE, 2015). The dredge sites included Arthur Kill, Kill Van Kull, Newark Bay, and Upper New York Bay. Although briefly addressed in the report, the effect of currents and tides on the dispersal of suspended sediment were not thoroughly examined or documented. Independent of bucket type or size, plumes dissipated to background levels within 600 feet of the source in the upper water column and 2,400 feet in the lower water column. Based on these analyses, elevated suspended sediment levels of up to 445 mg/L may be present in the immediate vicinity of the bucket, and suspended sediment levels of up to 191 mg/L could be present within a 2,000 foot radius from the location of the dredge.

Transportation activities to and from the dredge site should not increase turbidity due to the depths present in the channel and all approaches. At the disposal site, the material will be released through the bottom opening doors of the scow for deposition on the bottom. The release will result in limited exposure to the water column during the rapid descent. The resuspension in the water column is primarily dependent upon the size of the particles with limited effect from water currents prevalent at the time of disposal. The coarser grained material will fall rapidly to the bottom with limited suspension in the water column. Finer grained material can be suspended in the water column for transport by ambient currents, but the release rate has been found to be very low (Gordon, 1974).

During the discharge of sediment at offshore disposal sites, suspended sediment concentrations have been reported as high as 500.0 mg/L within 250 feet of the disposal vessel and decreasing to background levels (i.e. 15.0-100.0 mg/L depending on location and sea conditions within 1,000-6,500 feet (USACE, 1983). Multiple characterizations of disposal plume spatial and temporal dynamics have been conducted by the USACE New England District, providing an extensive body of knowledge on all aspects of off-shore disposal (e.g., Fredette and French, 2004; SAIC, 2005). TSS concentrations near the center of the plume created by the placement of dredged material have been observed to reach near background levels in 35-45 minutes (Battelle, 1994 in EPA and USACE, 2010). Dredged material will be disposed by point dumping, which would ensure that the bottom area affected by the placement is kept to a minimum. Previous DAMOS surveys at CADS, IOSN, and other similar sites have shown the placed material is likely to remain as a stable deposit on the seafloor (SAIC, 1991; Hickey, et al., 2014; McKelvey et al., 2018).

The life stages of sturgeon most vulnerable to increased sediment are eggs and non-mobile larvae which are subject to burial and suffocation. Sturgeon eggs and/or larvae will not be present in the action area, as the area is not associated with a spawning areas for the species. Foraging sturgeon may be within the action area, but have the ability to avoid sediment plumes by swimming around them if interactions with suspended sediment should occur. If sturgeon were to interact with the plume, expected TSS levels (up to 500.0 mg/l) are likely to be below those shown to have an adverse effect on fish (580.0 mg/l for the most sensitive species, with tolerances up to 1,000.0 mg/l for many species (Burton, 1993)).

No information is available on the effects of total suspended solids (TSS) on whales or sea turtles. TSS is most likely to affect whales and turtles if a plume causes a barrier to normal behaviors. Sea turtles are highly mobile and thus able to avoid any sediment plume they encounter with minor movements to alter their course away from the plume. Whales in the action area during project operations may avoid interacting with a sediment plume by making minor movements to swim around it. Whales and sea turtles also have the ability to swim to the surface to breathe air and avoid being exposed to the turbidity plumes.

We are requiring that disposal of dredge material at the placement sites be delayed in the event whales are within 1,500 feet of the scow. Any prey targeted by whales in the action area would be pelagic and highly mobile, and therefore would not be impacted by turbidity or TSS associated with dredging or disposal interactions. The same is true of jellyfish, the preferred prey species of leatherback sea turtles. Adult green sea turtles forage on sea grasses and no sea grasses are anticipated to be affected by the project or increased TSS.

Therefore, while there may be some temporary loss of foraging opportunities, the unaffected areas within the action area provide alternative foraging sites for listed species. Given the minor and temporary nature of the turbidity and TSS impacts, any

effects of turbidity on listed species will be too small to be meaningfully evaluated, measured, or detected, and are insignificant.

Habitat Modification from Dredging and Dredged Material Disposal

Effects to listed species can be caused by disturbance to the sea floor that reduces the availability of prey species or alters the composition of forage. Neither ESA-listed whale habitat nor their prey will be affected by the action, as whales and their prey forage and live in the water column.

Mechanical dredging as well as dredged material disposal can affect future use of the action area by sea turtles and sturgeon by reducing prey species through the alteration of the existing biotic assemblages. Green sea turtles forage on sea grasses and none occur in the project area. Leatherback sea turtles feed on jellyfish. As jellyfish are pelagic species and not vulnerable to interactions with the dredge, there is not likely to be a reduction in the forage base for leatherbacks. Kemp's ridley and loggerhead sea turtles typically feed on crabs, other crustaceans and mollusks. Some of the prey species targeted by sea turtles and sturgeon, including crabs, are mobile; therefore, some individuals are likely to avoid the dredge and dredged material placement.

Studies reviewed by Wilbur and Clarke (2007) demonstrate that benthic communities in temperate regions occupying shallow waters with a combination of sand, silt, or clay substrate reported recovery times between 1-11 months after dredging. Thus, we expect the benthic community within the project area to recover in less than one year, and no permanent removal of potential forage organisms from the area. Some species of benthic invertebrates that sturgeon feed on have limited mobility and could be temporarily buried during disposal operations. Some buried animals will be able to migrate upward through the sediment and reestablish themselves. The surrounding areas where dredged material will be placed are expected to be recolonized by individuals from similar habitats nearby.

Juvenile green and Kemp's ridley sea turtles, and both sturgeon species forage on benthic invertebrates. TSS levels above 390.0 mg/L may have an adverse effect on benthic communities (EPA, 1986). Some benthic invertebrates that sturgeon and turtles feed on have limited mobility and could be temporarily buried during disposal options. Some buried animals will be able to migrate upward through the sediment and reestablish themselves. In areas where benthic invertebrates experience adverse effects, we expect unaffected individuals from similar nearby habitats to recolonize impacted areas within a period of 1-11 months (Wilbur and Clarke, 2007).

While there is likely to be some temporary reduction in the amount of prey in the dredge and placement areas, the action will result in the loss of only a small portion of the available forage in the action area; up to 9 acres of sea-bottom. This habitat loss is small in comparison to the available foraging habitat within the action area. Therefore, sea turtles and sturgeon opportunistically foraging in Rye Harbor, CADS or IOSN will be

able to forage in other portions of the action area where benthic communities have not been removed or buried. As a result, effects of habitat modification from dredging and placement will be too small to be meaningfully measured or detected, and are therefore insignificant.

Water Quality (Dissolved Oxygen, Temperature, Pollutants etc.)

Minor and temporary effects on water quality parameters resulting from disposal activities may include lowered dissolved oxygen, changes in temperature, addition of pollutants, etc. Any discharges associated with authorized activities will meet all applicable water quality standards pursuant to the Clean Water Act and its implementing regulations, the Section 404(b)(a) guidelines, which are in place to prevent acute or chronic toxic impacts to aquatic life. Based on the toxicity, bioassay, and bioaccumulation results, and testing and evaluation requirements set forth in Section 103 of the Marine Protection, Research, and Sanctuaries Act (MPRSA), two suitability determinations were developed by the Corps and coordinated with the U.S. Environmental Protection Agency and State of Maine. All of the material proposed to be dredged was found suitable for unconfined open water placement at both the CADS and IOSN. The probability of transient sea turtles, sturgeon and whales being impacted by any temporary shifts in water quality is extremely unlikely because of the short time of the disturbance and the large water body that the disposal will be occurring. Additionally, there are protective conditions being implemented for this project that avoid disposal of material when sea turtles and whales are visible by an on-vessel observer. Therefore, the effects to water quality associated with the project activities are extremely unlikely and are discountable when added to baseline conditions.

Vessel Traffic

Collision with vessels remains a source of anthropogenic mortality and injury for whales, sturgeon and sea turtles as a result of being struck by boat hulls or propellers. Since ESA-listed species and work vessels may be present in the action area at the time of construction, the potential increased risk of vessel strikes has been considered.

In our analysis we considered three elements: (1) the existing baseline conditions, (2) the action and what it adds to existing baseline conditions, and (3) new baseline conditions (the existing baseline conditions and the action together). We have determined that vessel traffic added to baseline conditions as a result of the proposed project is not likely to adversely affect ESA-listed species for the following reasons.

Rye Harbor has approximately 150 deep water moorings, and another 50 nearshore (small vessel) moorings. At the harbor's highest use during the summer months, commercial fishermen represent approximately five commercial gillnet vessels, 15-20 lobster vessels, and 20 tuna vessels. There are also several sailboats, recreational boaters and a barge transporting goods to the Isles of Shoals Islands that seasonally utilize the boat ramp and moorings. An estimate of daily vessels utilizing the harbor is 100 vessels or less. This number is reduced significantly during the project's

work window of November 15 to March 15 (Leo Axtin, Rye Harbor Harbormaster, pers. comm., 2019).

Adding project vessels to the existing vessel traffic is not likely to increase likelihood of vessel strikes in the project area. The increase in traffic associated with the proposed project is extremely small. During project activities, approximately 2-3 project vessels (tug boats, scows, and support vessels) will be added to the baseline of approximately 30 vessels. The addition of project vessels will also be intermittent, temporary, and restricted to a small portion of the overall action area on any given day. As such, any increased risk of a vessel strike caused by the project will be too small to be meaningfully measured or detected. As a result, the effect of the action on the increased risk of a vessel strike in Rye Harbor is insignificant.

Transportation of the dredged material would involve 2-3 vessels (tugs and scows). Maintenance dredging and disposal activities are expected to take two to three months to complete. The scows used to transport the dredge material are likely to range in capacity from 1,200 cubic yards to 2,000 cubic yards. Given the volume of dredge material (50,000 cubic yards) the scow is estimated to take no more than 50 trips, transporting material to either of the disposal locations. Furthermore, a NMFS approved observer will be present on any vessels transiting to/from the disposal sites to ensure interactions with wildlife are minimized.

Once construction is completed, the FNP will be maintained to authorized/maintained depths and, as a result, it is expected to enable vessels to travel safely in the area. Allowing safe passage in the navigation channel is not expected to change the number of vessels or alter vessel traffic patterns in the action area; thus, preserving the status quo with regard to vessel numbers will not change the risk of a vessel strike. Any slight increase in the risk from altered patterns of vessel traffic would be too small to be detected or measured, and effects are, therefore, insignificant.

North Atlantic Right Whale Critical Habitat

As stated above, one physical and biological feature (PBF-3) of designated North Atlantic right whale critical habitat (i.e., late stage *C. finmarchicus* in dense aggregations in the Gulf of Maine) may occur in the action area. Only the IOSN is located within designated North Atlantic right whale critical habitat. The tugboats, scows, and support vessels transiting from the dredge site to IOSN will not result in environmental effects including increased turbidity, disturbance of benthic communities, elevated sound pressure, and resuspension of contaminants and toxins. Dredge material disposal can result in a number of potential temporary environmental effects including increased turbidity and disturbance of benthic communities. However, total suspended solids near the center of the sediment plume body have been observed to return to near background levels in 35 to 45 minutes, and the proposed action will have ephemeral effects on existing site conditions that will rapidly disperse at depths where the essential foraging feature may be present. Based on the best available information, we conclude

that the proposed action will not have any effect on the conservation value of physical and biological feature (3), or any of the other physical and biological features for right whale critical habitat.

Conclusion

Based on the analysis that all effects of the proposed action will be insignificant and/or discountable when added to the baseline, we have determined that maintenance dredging of the Rye Harbor FNP with placement at the CADS or IOSN is not likely to adversely affect any listed species or critical habitat under NMFS' jurisdiction. We certify that we have used the best scientific and commercial data available to complete this analysis. We request your concurrence with this determination that you provide your response within 30 days of the date of this letter. Please have your staff contact Reid Lichwell at 978-318-8148 or by email at Reid.Lichwell@usace.army.mil if further information is required.

Sincerely,

Michael E. Walsh, P.E., PMP
Navigation Project Manager

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