

extends the site's status. Due to the fact that CADS may close prior to construction, a second open water disposal site, the PDS, is also in consideration for this project. PDS is located about 21 nautical miles northeast of Cape Porpoise.

The work will be performed by a private contractor utilizing a mechanical bucket dredge with scows under contract to the government. Dependent upon the size of scow used by the contractor, it is conservatively estimated that 90 trips will be taken by a small scow (400 cy capacity) or 30 trips with a larger scow (1,200 cy capacity) to CADS or PDS. The work will take approximately one to three months to accomplish between November 1 and March 15 of the year(s) in which funds become available. This time of year will limit adverse impacts to federally-listed endangered and threatened species as well as avoid the spawning of winter flounder and shellfish that may be present in or adjacent to the project areas. If CADS is utilized, then no special conditions for placement would be required. The special conditions for PDS are listed below.

The purpose of the project is to return the FNP to its authorized dimensions sufficient for project users. The local economy is heavily dependent on commercial lobstering and tourism. Cape Porpoise Harbor has approximately 120 moorings with commercial fishermen using most moorings. The harbor supports a small fleet of lobster fishermen and draggers with protected docks and moorings. Sediment has accumulated in the channel since the project was last dredged in 1976. This has reduced depths creating hazards to navigation and impeding vessel traffic. Without maintenance dredging, additional shoaling could create further navigation hazards in Cape Porpoise Harbor, thereby limiting revenue for the local economy from the commercial lobstering, fishing, and tourism industries.

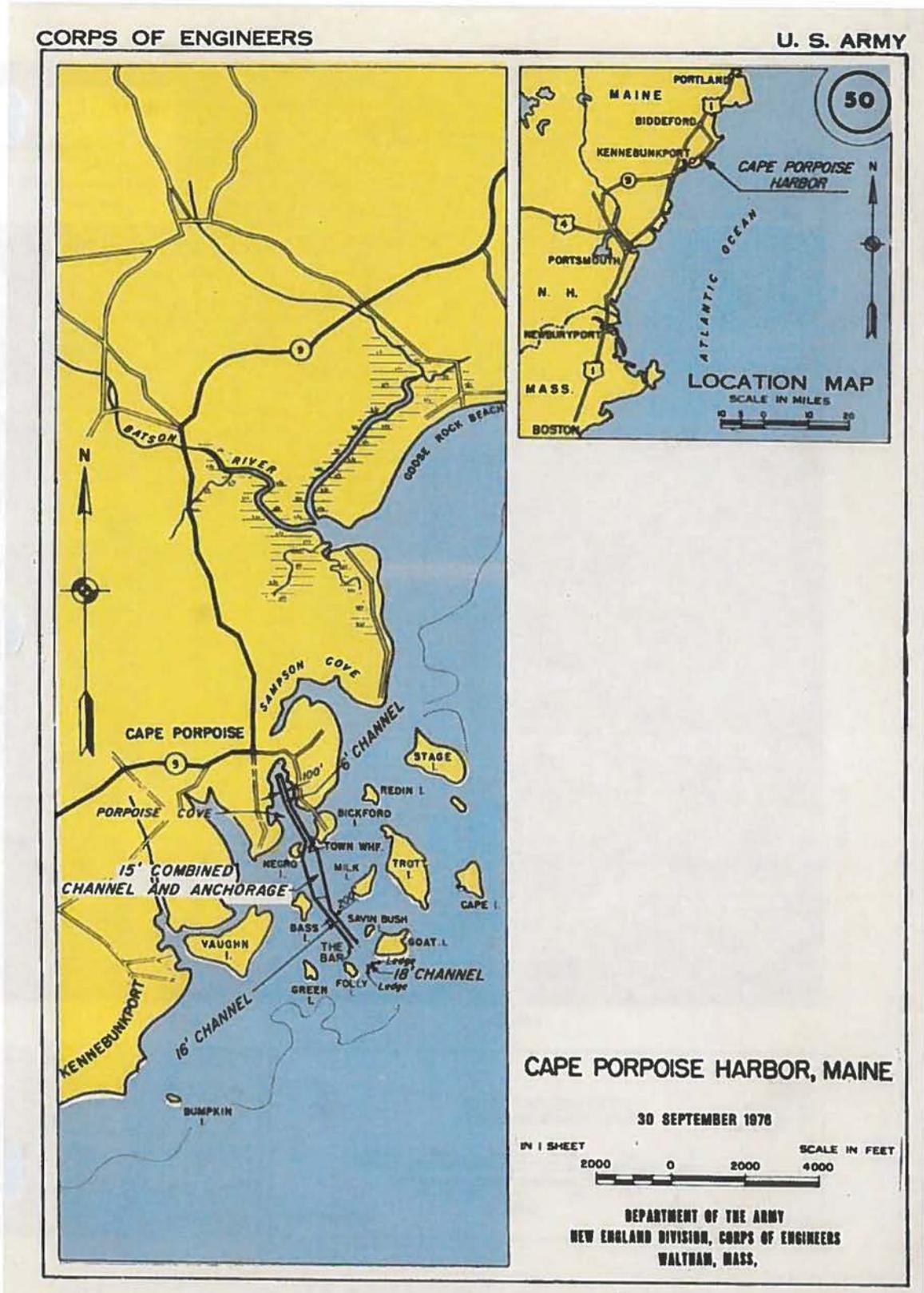


Figure 1. Cape Porpoise Harbor Federal Navigation Project.

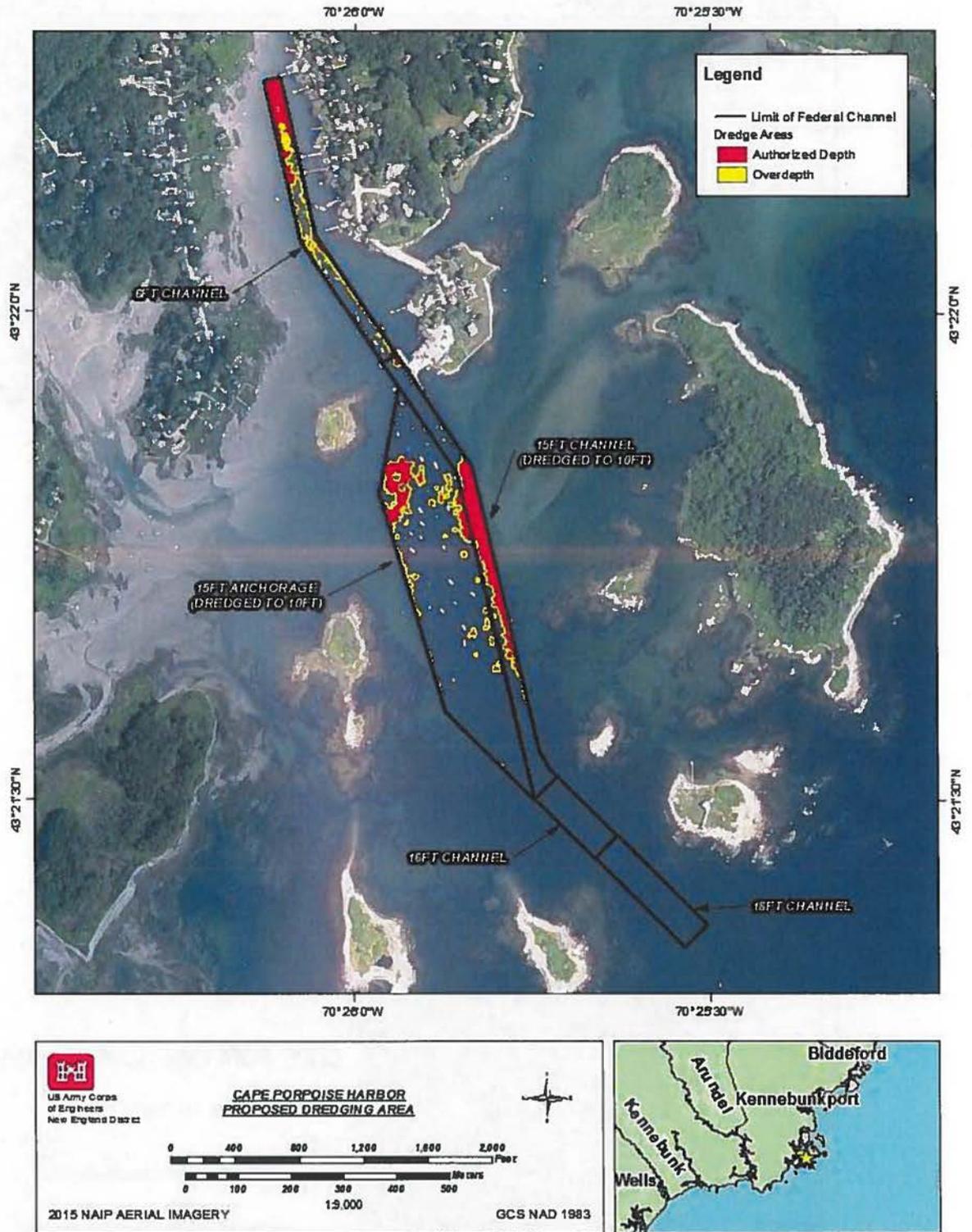
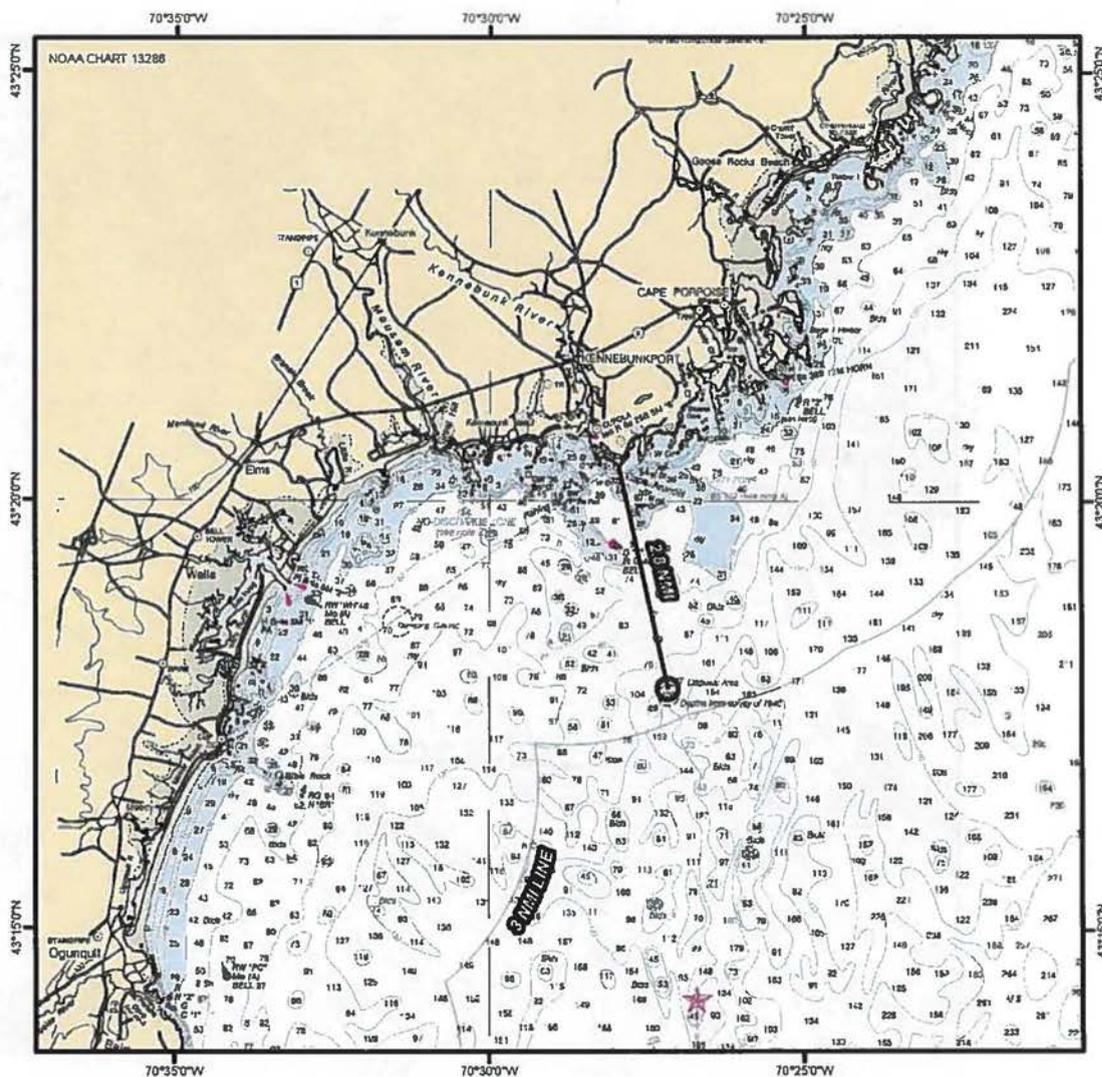


Figure 2. Areas to be dredged in the Cape Porpoise Harbor FNP.



CAPE ARUNDEL DISPOSAL SITE

Description: The Cape Arundel Disposal Site (CADS) is located approximately 2.8 nmi (5.1 km) southeast of Cape Arundel, Maine. The site consists of a 500 yd diameter circle centered at 43° 17.805' N, 70° 27.170' W (NAD 83). Its bottom topography is characterized by a north-south trending trough running 1 km in length and 50 to 250 m wide. This trough has a maximum depth of 43 m and a silt/clay bottom admixed with fine sand. It is flanked by hard rock ridges shoaling up to 30 to 32 m in depth. The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents.

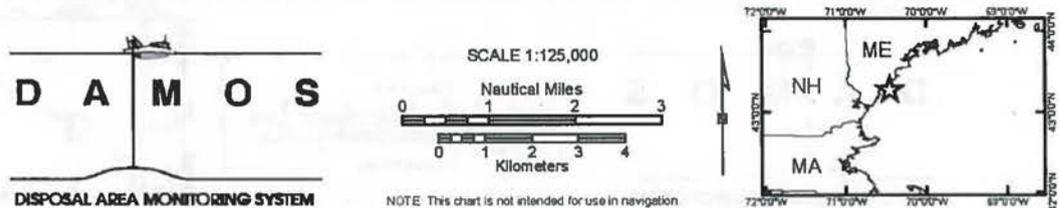
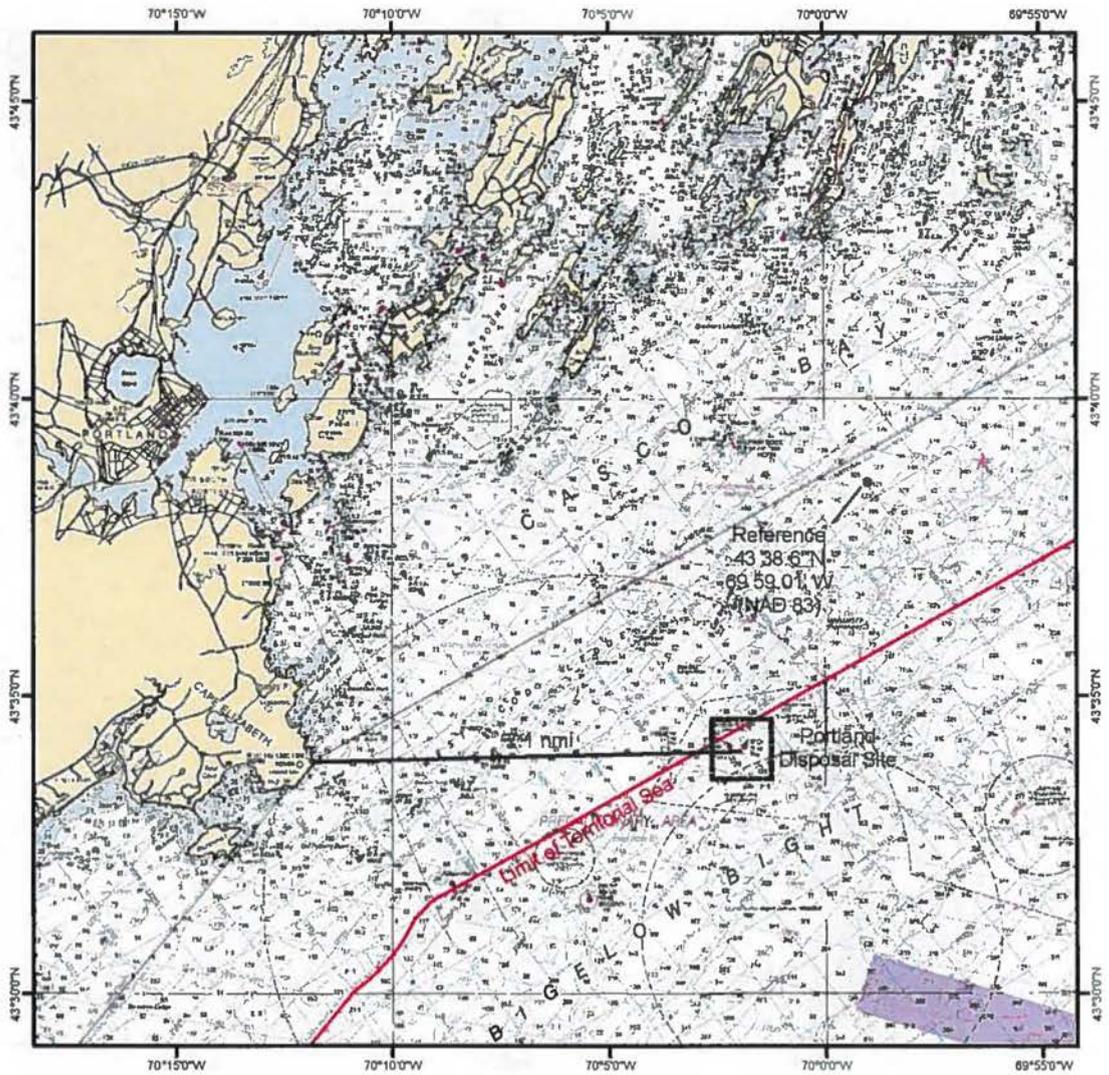
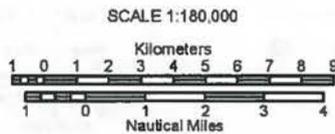
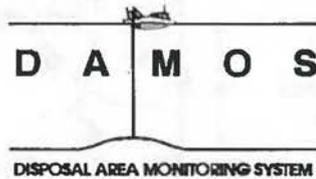


Figure 3. Cape Arundel Disposal Site



PORTLAND DISPOSAL SITE

Description: The Portland Disposal Site (PDS) is one of three regional dredged material disposal sites located in the waters of Maine. It covers a 1 nmi² (3.4 km²) area of seafloor centered at 43° 34.111' N, 70° 01.9386' W (NAD 83), approximately 7.1 nmi (13.2 km) east of Dyer Point, Cape Elizabeth, Maine. PDS is characterized by a rough, irregular bottom topography, with areas of soft sediment accumulation in the basins among bedrock outcrops. The authorized disposal point (within the overall disposal area) is specified for each dredging project in other project documents



NOTE: This chart is not intended for use in navigation.



Figure 4. Portland Disposal Site

2. Special Conditions

Portland Disposal Site

1. A marine mammal/turtle observer with written approval from the National Marine Fisheries Service (NMFS) (http://www.greateratlantic.fisheries.noaa.gov/prot_res/ObserverProgram/), and contracted and paid for by the permittee, must be present aboard disposal vessels for all transportation and disposal activities. Or, in lieu of a NMFS approved observer, the disposal vessel operator can assign a crewmember to be the designated lookout for that trip. The name of the observer or designated lookout 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 captain, observer or designated lookout shall:
 - a. Contact NMFS at (978) 282-8469 and check www.1istenforwhales.org 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 or USCG via CH-16 and immediately report any injured or dead marine mammals or sea turtles to NMFS at (866) 755-NOAA.
3. The vessel captain shall:
 - a. Lookout for turtles and whales at all times; and
 - b. Employ its searchlight in darkness or otherwise limited visibility for the benefit of the observer when disposal vessels have left the harbor and are traveling to, at, or returning from the disposal site; and
 - c. Avoid harassment of or direct impact to turtles and whales except when precluded by safety considerations; and
 - d. Ensure that the disposal vessel adheres to the attached NMFS regulations for approaching right whales, 50 CFR 222.32, which restrict approaches within 1,500 feet (500 yards) of a right whale and specify avoidance measures for vessels that encounter right whales; and
 - e. Ensure that dredged material is not released if whales are within 1,500 feet or turtles are within 600 feet of the specified disposal point. The captain must check in with observer or designated lookout prior to releasing the dredged material. If whales or turtles are within these distances and appear to be moving away from the specified disposal point, within these distances and appear to be remaining stationary, or outside these distances but appear to be moving towards the specified disposal point, the vessel captain shall wait until they have cleared the specified disposal point by these distances and are not moving towards it, and then proceed with disposal at the specified disposal point.

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). For this project, the action area consists of the proposed dredging areas within the Cape Porpoise Harbor FNP which is approximately 12 acres, the extent of turbidity plumes created from the dredging which should be confined to a 2,000 foot radius from the mechanical dredge, as well as the CADS or PDS footprint where disposed dredge material will settle (approximately 3 acres), the extent of turbidity plumes created from open water disposal (i.e., up to a 6,500 ft. radius from the disposal location), and all routes travelled by the project vessels. The Cape Porpoise Harbor FNP is located at 43°21'43.13" N, 70°25'48.30" W (NAD83). These areas are expected to encompass all of the direct and indirect effects of the proposed action.

Cape Porpoise is a small coastal village located in the town of Kennebunkport, York County, Maine. The village occupies the mainland adjacent to Cape Porpoise Harbor, north of Kennebunkport village and south of Goose Rocks Beach. The area around Cape Porpoise Harbor is part of the low-lying coastal plain which is common to York County. The harbor is surrounded by several islands including Goat, Folly, Vaughn, Green, Trott, and Bickford. There are no major estuaries connected to the harbor; however, tidal currents among the islands carry and deposit sediments in the harbor causing shoaling in the authorized navigation channels and anchorage. Sediments within Cape Porpoise Harbor range from gravel and sand to fine-grained (silt and clay). The material to be dredged is 21% to 44% fine grained silt and clay. 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 Cape Porpoise FNP are considered suitable for unconfined open water disposal at CADS and PDS. Separate suitability determinations for CADS and PDS were confirmed by the U.S. Environmental Protection Agency (USEPA) and the State of Maine Department of Environmental Protection (MEDEP) (USACE, 2016; USACE, 2017).

Water quality in the harbor is dictated by the large tidal exchange with the open ocean to the southeast and is classified as SB (estuarine and marine waters) by the State of Maine (MEDEP, 2012). The water quality standards for these waters dictate that these waters shall be of such quality that they are suitable for the designated uses of recreation in and on the water, fishing, aquaculture, propagation and harvesting of shellfish, industrial process and cooling water supply, hydroelectric power generation and navigation, and as habitat for fish and other estuarine and marine life (Maine State Legislature, 2011). The mean tidal range of the harbor is 8.8 feet (NOAA, 2017).

The Cape Arundel Disposal Site is a 1,500 foot diameter circle located at 43°17.800' N, 70°27.200' W (NAD 83) in the Atlantic Ocean. Water depths at CADS vary from 98 feet to 138 feet (30 to 42 meters) with complex topography. CADS is generally deeper in the north and south and shallower in the west and southwest portions. Past surveys have found hard rock outcrops in the shallower areas and

relatively soft sediment in the deeper basins in CADS (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 re-suspended and transported (Hickey, et al., 2014). CADS was previously used for disposal of about 132,000 cy of organic silts and fine sand and clay dredged from Cape Porpoise Harbor FNP in 1976.

The Portland Disposal Site, centered at 43° 34.111' N, 70° 01.9386' W (NAD 83), covers a 1 nm² area approximately 7.1 nm east of Dryer Point, Cape Elizabeth, Maine. Water depths at PDS range from 138 to 203 feet (42 to 62 meters). The Final Environmental Impact Statement for the designation of the Portland, Maine Dredged Material Disposal Site was released in 1983 and in September 1987, the U.S. Environmental Protection Agency, New England Region (EPA-NE) designated the PDS for long-term use for the disposal of dredged material from Maine and New Hampshire. An average of 99,000 cy of dredged material is deposited annually in the PDS at specified disposal coordinates located in the northern region of the site, or at an alternative buoy placed at the site by the Corps in years with heavy disposal activity.

Monitoring of the two disposal sites has occurred periodically under the Corps' Disposal Area Monitoring System (DAMOS) program. DAMOS surveys of both sites show that they are in low energy environments such that sediment deposited at the locations will remain within the sites' boundaries. Levels of metals and organics in the sediments within the two disposal sites are generally low and not substantially greater than background levels, indicative of the relatively uncontaminated nature of the areas dredged that utilize the sites (Hickey et al., 2014; McKelvey et al., 2018). Areas outside the two disposal sites have not been found to be affected by sediment deposited within the sites (CADS: Hickey et al., 2014; SAIC, 1991. PDS: McKelvey et al., 2018; Sturdivant & Carey, 2017; SAIC 1998).

According to the 2017 USACE survey, eelgrass is present within and adjacent to the FNP in Cape Porpoise Harbor (Appendix D). Approximately 20.4 acres of eelgrass exist alongside the FNP with several more eelgrass beds scattered between the surrounding islands. The eelgrass bed along the eastern side of the channel was observed to begin at the top of the channel side slope and to extend beyond the survey boundary to the south and east. The eelgrass along the western side of the channel was set further back from the channel slope and transitioned rapidly to dense beds of macroalgae, (predominantly rockweed (*Fucus sp.*) and kelp (*Laminaria sp.*), growing on a boulder and cobble substrate. Figure 5 depicts the areas of eelgrass within and adjacent to the FNP. It should be noted that the eelgrass survey was conducted using the 2015 USACE condition survey which showed fewer shoal areas than the most up to date condition survey taken in 2018. The 2018 condition survey shows shoals in the 15-foot channel south of the area surveyed for eelgrass. Therefore, an area has been estimated using the ME DMR maps which extends southward along the eastern side of the channel to account for the area not surveyed in the 2017 Corps SAV survey

In order to characterize the benthic environment of Cape Porpoise Harbor, three grab samples were taken from shoals within the FNP in 2017. The sediment type where the grabs were taken consisted of a mix of medium to fine sand and silt. To summarize, a combined total of 22 taxa were reported from the three stations with a range of 18-369 individuals per sample. Taxa consisted of mostly early colonizing polychaete species with some equilibrium species (ex. bivalves), indicative of the habitat being subject to mild environmental disturbances such as coastal storms, prop dredging, maintenance dredging, etc.

The area of eelgrass growing within the FNP that will be directly removed is approximately 121 square feet or 0.003 acres. This represents 0.015% of eelgrass out of the estimated surrounding 20.4 acres. Utilizing the box cut method of dredging in this area will prevent and/or reduce channel sloughing and further impacts to the eelgrass bed. The material in this location is well-consolidated and is expected to remain in place, therefore we do not expect additional channel sloughing to occur. To minimize any added sloughing, the contractor will not be permitted to anchor or spud on the side slopes.

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).

The Portland Disposal Site benthic community was characterized in the 2016 DAMOS study of the site. Of the 12 stations analyzed for grain size for that study, additional material was collected at 6 of the stations for benthic community structure analysis. A total of 110 species were found over all stations (reference + site) with a mean species richness of 55 species per station (McKelvey et al., 2018, Appendix I). Total abundance overall was 3,303, with a mean of 551 individuals per station. While the composition of species found to dominate each site varied considerably, all stations were populated with deposit-feeding polychaetes and small suspension-feeding bivalves.

Shellfish resources in Cape Porpoise Harbor, CADS, and PDS include lobsters (*Homarus americanus*), crabs (*Cancer irroratus* and *C. borealis*), ocean quahog (*Mercenaria mercenaria*), sea scallop (*Placopecten magellanicus*), northern shrimp (*Penaeus* spp), softshell clams (*Mya arenaria*) and blue mussels (*Mytilus edulis*). Maine Department of Marine Resources (ME DMR) shellfish maps show that softshell clam habitat exists along the northeastern edge of the 15-foot anchorage and to the west of the FNP. Although clams have been harvested from flats adjacent to the outer harbor, green crab predation has kept the softshell clam population low. Blue mussel habitat is located outside of the project area on the eastern side of Trott Island (ME DMR, 2013). Lobsters are actively fished in and around Cape Porpoise Harbor, CADS, and PDS.

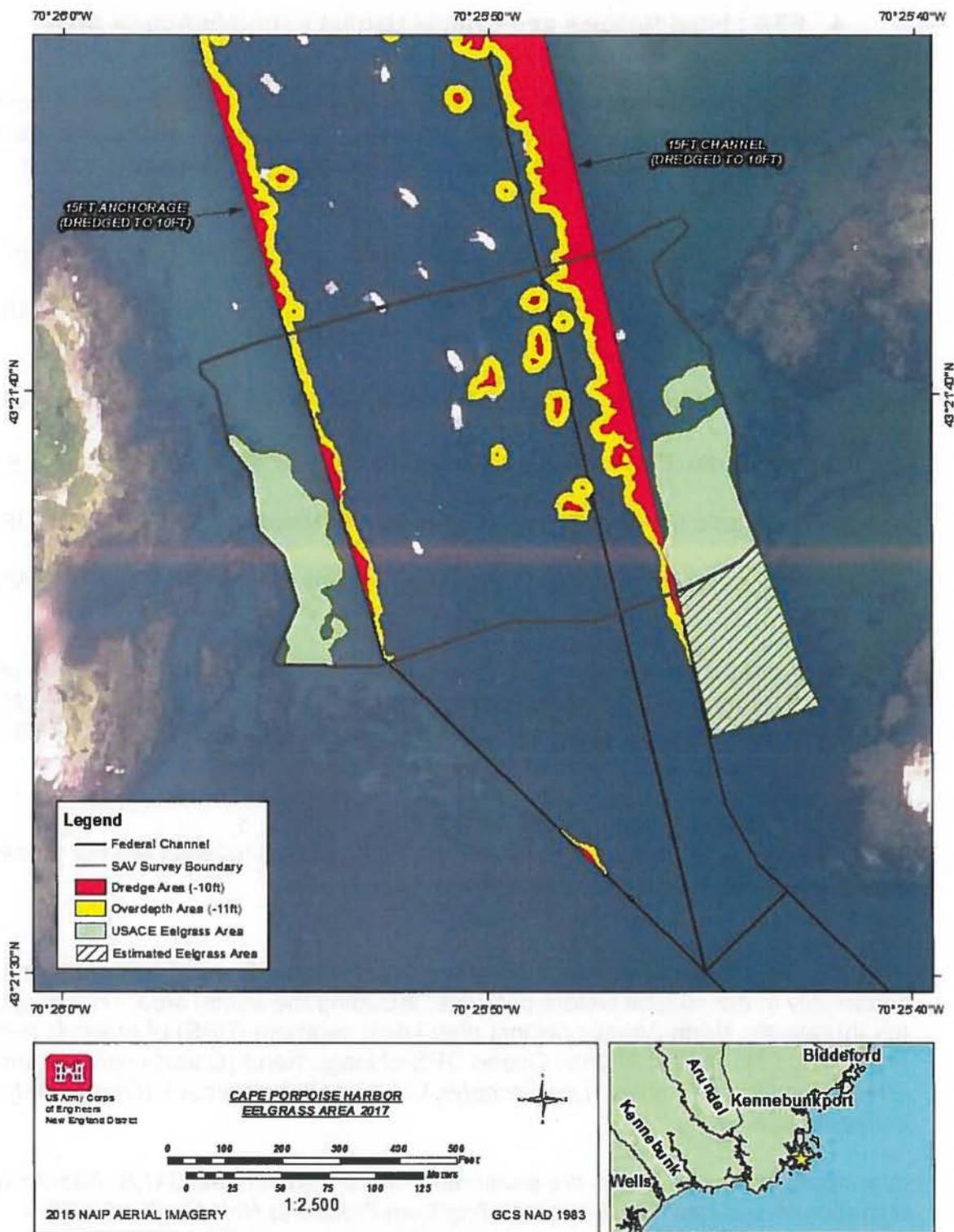


Figure 5. Eelgrass adjacent to the Cape Porpoise FNP (USACE, 2017).

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

- a. 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.

Whales

North Atlantic Right Whale (*Eubalaena glacialis*)(73 FR 12024; Recovery Plan: NMFS 2005)

Fin Whale (*Balaenoptera physalus*)(35 FR 18319; Recovery Plan: NMFS 2010a)

Sea Turtles

Kemp's Ridley Turtle (*Lepidochelys kempii*)(35 FR 18319; Recovery plan: NMFS et al. 2011)

Leatherback Turtle (*Dermochelys coriacea*)(35 FR 849; 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 2005)

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 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 time when they search for food. Kemp's ridleys rarely venture into waters deeper than 160 ft (50 m) (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 (5 to 15 meters) 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 they are expected to be in the action area, opportunistically foraging and transient sea turtles could be present in the dredging site as well as along the transit routes to CADS and PDS during the month of November. Due to the depths present at CADS (98-138 feet) and PDS (138-203 feet), we do not expect sea turtles to be foraging in those areas.

Atlantic Sturgeon

There are five DPSs of Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) listed as threatened or endangered. 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 action area.

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. The closest documented spawning grounds for Atlantic sturgeon are in the Kennebec River approximately 37 nautical miles north. Early life stages are not tolerant of salinity; therefore their eggs and larvae will not occur at CADS, PDS, or within the Cape Porpoise 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 (10-50 m 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 or 2.5 m), 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. The Saco River, located roughly 13 nautical miles north of Cape Porpoise Harbor, is known foraging habitat for Atlantic sturgeon.

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. The action area (dredge and disposal sites, and transit routes) is not located within any known overwintering areas; therefore, Atlantic sturgeon are most likely to be present in the action area from April through November, but 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, particularly in the November 1 to March 15 work window.

Shortnose Sturgeon

Shortnose sturgeon occur in rivers and estuaries along the east coast of the U.S. and Canada (ASSRT, 2007). In the U.S., they are listed as endangered throughout their range. There are 19 documented populations of shortnose sturgeon, with the population closest to the action area occurring approximately 37 nautical miles north in the Kennebec River. 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.

The Saco River, located roughly 13 nautical miles north of Cape Porpoise Harbor, is known foraging habitat for shortnose sturgeon. As with Atlantic sturgeon, spawning and early life stages of the shortnose sturgeon only occur in freshwater habitats. Therefore, no life stages besides salinity tolerant adults should occur in the action area. It is possible that migrating or opportunistically feeding shortnose sturgeon may be present in the action area for short periods of time during in-water work from Nov 1-30.

Atlantic Salmon

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. By the fall, adults return from areas off the coast of Greenland to their natal rivers, but the currents don't typically carry them off course. 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 the PDS and along the transit route to/from Cape Porpoise Harbor.

The 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, Jeffreys Ledge and Cashes Ledge. Regarding behaviors anticipated to occur, 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, Jeffreys and Cashes Ledge, Jordan Basin, and Massachusetts Bay (e.g., Stellwagen Bank).

Fin whales found off the eastern United States are centered along the 100 meter (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 1,000- fathom (6,000 feet) 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 (40-50 m) depth contour and therefore can occur in the vicinity of the PDS and CADS. 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 (~40-50 meter contour), the western Gulf of Maine (especially Jeffreys 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 Cape Porpoise Harbor and we do not expect right or fin whales to be present in the dredge footprint area given the depths present. Both species could be present throughout the in-water work window along vessel transit routes outside of Cape Porpoise Harbor and at the two disposal sites.

North Atlantic Right Whale Critical Habitat

The proposed project's associated action area (PDS and transit routes) is located within designated North Atlantic right whale critical habitat (NARW CH). CADS is located approximately 0.6 miles to the west outside of NARW 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 (NOAA 2016)."

The final rule (81 FR 4837) 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 *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 diapausing *C. finmarchicus* to aggregate passively below the convective layer so that the copepods are retained in the basins; (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.

The PDS and a portion of the transit route from Cape Porpoise Harbor to/from PDS overlaps with designated critical habitat, but only one of the four physical and biological features essential to right whale foraging, as described above, may occur (i.e., PBF 3, an aggregation of the copepod *Calanus finmarchicus*).

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.

Whales

We do not expect ESA-listed whales to occur in the dredge footprint area within Cape Porpoise Harbor due to the shallow depths present. Therefore, no effects to whales are expected from entrapment in a mechanical dredge.

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 information, 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 Cape Porpoise 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. Therefore, 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 U.S. Army Corps of Engineers 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 (183 meters) of the source in the upper water column and 2,400 feet (732 meters) 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 (76 meters) 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 (305-1981 meters) (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, PDS, and other similar sites have shown the placed material 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. As noted above, no sturgeon eggs and/or larvae will be present in the action area. Sturgeon will have plenty of room within the action area to avoid a sediment plume by swimming around it during the dredging and disposal events. However, if sturgeon do interact with the plume, expected TSS levels (up to 500.0 mg/l) are below those shown to have an adverse effect on fish (580.0 mg/l for the most sensitive species, with 1,000.0 mg/l more typical (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 be delayed at the PDS if any whales are within 1,500 feet. 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 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. The dredge and placement activities have the potential to impact up to an estimated 30 acres of bottom habitat. Green sea turtles forage on sea grasses. Although eelgrass is located within and adjacent to Cape Porpoise Harbor, only 0.015% of eelgrass present in the area is expected to be impacted as a result of the proposed project, leaving the remaining surrounding seagrasses available for forage.

In general, the main impacts to seagrasses from dredging include the physical removal and/or burial of vegetation, effects of turbidity and sedimentation, and channel sloughing during or following dredge activity (Erftemeijer and Robin Lewis III, 2006). Dredged material may come into suspension during dredging due to disturbance of the bottom, transport to the surface (specific to mechanical dredging), and overflow from barges. The degree of negative environmental impacts due to dredging and disposal depends on several factors: quantity, frequency and duration of dredging, methodology of dredging and disposal, physical dimensions and water depth of the dredging location, grain-size composition, density and degree of contamination of the dredged material, background water quality (i.e. suspended matter and turbidity), seasonal variations in weather conditions (i.e. wind and waves), and the proximity/distance of sensitive or important areas in relation to dredging or disposal site operation (Erftemeijer and Robin Lewis III, 2006). Dredging activities often generate no more increased suspended sediments than commercial shipping operations, bottom fishing or severe storms (Erftemeijer and Robin Lewis III, 2006).

Turbidity is unlikely to be continuous at any specific location due to changes in wind and currents as well as changes in dredge location and dredging rate. Seagrasses and the benthic community often have greater resilience in areas where natural turbidity fluctuations are common when compared to areas where such fluctuations are minimal (Erftemeijer and Robin Lewis III, 2006). Unlike fine grained material, which when dredged may remain in the water column for a longer period of time causing light limitation impacts to seagrasses, the potential for indirect impacts appears to be minimized if the dredged sediments are coarse-grained since these sediments settle rapidly and contribute little to water column turbidity and re-suspension (Sabol and Shafer, 2005). The dredged material in sediment samples taken nearest the eelgrass beds (Samples C, D, H and I on Figure 6) are predominantly medium to fine sand (C=84.6% sand; D=72.9%; H=72.6%; I=71.3%). This material is expected to settle out of the water column within a short period of time and proximal to the dredge. The material that is predominantly silty (Samples M, N, and O) is located over 1,300 feet away from eelgrass beds. Therefore, sedimentation and light attenuation impacts to eelgrass caused by the dredging are expected to be minimal.

In addition, the amount of material to be dredged within 100 feet of eelgrass is approximately 800 cubic yards. Given the nature of the material to be dredged, we do not expect sediment washing off of the dredge bucket to remain suspended in the water column long enough to cause adverse impacts by deposition on the eelgrass bed. Sediment resuspension data have been collected from a variety of navigation dredging operations (Nakai, 1978, Pennekamp et al., 1996, Hayes et al., 2000). Based on these data sets, Hayes et al. (in preparation) estimated that the conservative characteristic resuspension factor for mechanical dredges with open or watertight buckets without overflow is about 1 percent. The coarse-grained fraction of material (sands and gravels) is assumed to settle back quickly near the dredge and is not able to be transported from the site as a suspended load (Palermo et al., 2008). Using the resuspension factor of 1 percent, approximately 8 cubic yards of material may be

released into the water column during dredging. This material, which is over 70% sand, is expected to rapidly settle out of the water column adjacent to the dredge.

Furthermore, Cape Porpoise Harbor is a coastal marine environment subject to short-term increases in turbidity from coastal storms, wave action, and tidal flushing. Thus, the eelgrass present has the ability to withstand such short term periodic increases in suspended sediment and deposition as evidenced by its presence in that area. Bed shading caused by the dredge plant and scows is not expected to cause adverse impacts because the area to be dredged adjacent to eelgrass is minimal in size and located in such a way that will require the dredge to continuously move. Dredging in these portions of the FNP are expected to take several hours to 1-2 days to complete.

To ensure that no dredging will take place in areas of eelgrass outside of the FNP, the contractor will be provided drawings containing the eelgrass areas prior to commencement of work. The contract specifications will also delineate the areas to avoid. Additionally, the Dredge Quality Management System gives the Corps the capability to monitor equipment locations during the project. No anchoring, spudding, scouring, or transiting through will be permitted within areas of eelgrass.

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.

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. For this project, the action area consists of the proposed dredging areas within the Cape Porpoise Harbor FNP which is approximately 12 acres, the extent of turbidity plumes created from the dredging which should be confined to a 2,000 foot radius from the mechanical dredge, as well as the CADS or PDS footprint where disposed dredge material will settle (approximately 3 acres), the extent of turbidity plumes created from open water disposal (i.e., up to a 6,500 ft. radius from the disposal location), and all routes travelled by the project vessels. Therefore,

sea turtles and sturgeon opportunistically foraging in Cape Porpoise Harbor or the CADS or PDS will be able to forage in other areas of the action area, where benthic communities have not been removed or buried. As a result, effects on 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 PDS. The probability of transient sea turtles and sturgeon 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 in, as well as the protective conditions that avoid disposal when sea turtles and whales are visible (see above); therefore, effects, when added to baseline conditions, are discountable.

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 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.

Cape Porpoise Harbor has approximately 120 moorings with commercial fishermen using most moorings. The harbor supports a fleet of lobster fishermen and draggers with protected docks and moorings, several sport fishing charter boats, and seasonal recreational boaters. The town landing includes a bait house and a diesel fueling station. A conservative estimate of daily vessels utilizing the harbor is 70 vessels or less. This number is reduced significantly during the project's work window of November 1 to March 15 when about 50 mostly commercial vessels regularly use the harbor (Lee McCurdy, Cape Porpoise Harbormaster, pers. comm., 2018).

Adding project vessels to the existing baseline will not increase the risk that any vessel in the area will strike an individual, or will increase it to such a small extent that the effect of the action (i.e., any increase in risk of a strike caused by the project) cannot be meaningfully measured or detected. 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 70 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 risk of a vessel strike in Cape Porpoise Harbor is insignificant.

Transportation of the dredged material would involve 2-4 vessels (tugs and scows). Maintenance dredging is expected to take one to three months to complete. A conservative estimate of the barge and scow vessel trips to the placement site is approximately 90 if the contractor were to utilize the smallest capacity scow (400 cy capacity) and 30 trips if a larger capacity scow were utilized.

The addition of project vessels will also be intermittent (every 15-20 years), temporary (maximum of 90 trips), and restricted to a small portion of the overall action area on any day disposal occurs. The disposal portion of the action area is in a coastal environment where listed species are able to disperse widely, reducing the risk of vessel strike. Furthermore, an observer or designated lookout posted to watch for sea turtles and whales will be present on any vessels transiting to/from PDS. As a result, the effect of the action on the risk of a vessel strike for marine mammals, sturgeon, or sea turtles while offshore is discountable.

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 routes and numbers which will not change or increase the risk of a vessel strike. According to the Cape Porpoise Harbormaster, approximately 5 moorings may be added in the anchorage area as a result of the project; therefore, vessel capacity will remain essentially the same (Lee McCurdy, Cape Porpoise Harbormaster, pers. comm., 2018). Any slight increase in risk from altered patterns of use would be too small to be detected or measured, and effects are, therefore, insignificant.

North Atlantic Right Whale Critical Habitat

As stated above, physical and biological feature (3) of designated North Atlantic right whale critical habitat (i.e., late stage *C. finmarchicus* in dense aggregations) may occur in the action area. The proposed dredge site within Cape Porpoise Harbor is not within North Atlantic right whale critical habitat and will therefore have no effect on the critical habitat. The tugboats, scows, and support vessels transiting from the dredge site to the PDS site 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, 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 physical and biological feature (3), or any of the other physical and biological features for right whale critical habitat.

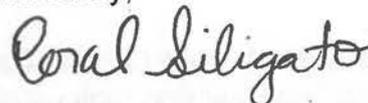
6. Aggregate Effects of Habitat Modification

The existing habitat in the action area (i.e. primarily sand and silt in shallow water within Cape Porpoise Harbor, and silt and regularly disturbed habitat in CADS and PDS) is expected to provide limited benthic foraging resources and thus, does not constitute preferred foraging habitat for sea turtles and sturgeon. However, transient individuals may at times opportunistically forage where limited benthic resources are available. As previously stated, disturbed habitat in the action area is expected to recover within one year after completion of project activities. Thus, transient individuals will once again be able to opportunistically forage after habitat has recovered. Given that there will be only 1-2 dredge events within the span of the 10-year consultation, this will allow benthic habitat to recover enough to provide forage in between dredge events. Additionally, habitat surrounding the action area provides foraging for listed species, and thus individuals are not limited to only opportunistically foraging within the action area. As such, aggregate effects of repeated habitat disturbance on listed species will not accumulate over the 10-year duration of the consultation and effects are expected to be too small to be meaningfully detected, and are therefore insignificant.

7. 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 Cape Porpoise Harbor FNP with placement at the CADS or PDS 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 Grace Moses at 978-318-8717 or by email at c.grace.moses@usace.army.mil if further information is required.

Sincerely,



Coral Siligato
Project Manager

Enclosures

Copy Furnished:

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