GREAT CHEBEAGUE ISLAND
CUMBERLAND COUNTY, MAINE

NAVIGATION IMPROVEMENT PROJECT

DRAFT
ENVIRONMENTAL ASSESSMENT
AND
FINDING OF NO SIGNIFICANT IMPACT

NEW ENGLAND DISTRICT
US ARMY CORPS OF ENGINEERS
696 VIRGINIA ROAD
CONCORD, MASSACHUSETTS 01742-2751

JANUARY 2021

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FINDING OF NO SIGNIFICANT IMPACT

The U.S. Army Corps of Engineers, New England District (USACE) has conducted an environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. The draft Environmental Assessment (EA) dated January 2021, for the Great Chebeague Island navigation improvement project.

The proposed Great Chebeague Island navigation improvement dredging project involves the dredging of a navigation channel and a turning basin. The proposed dredging requires the removal of approximately 34,000 cubic yards of sediments composed of mixed gravel, sand, and silt (Figure EA-1). This material is proposed to be mechanically dredged and placed at the Portland Disposal Site (PDS) (Figure EA-2) approximately 15 nautical miles away. The work will be accomplished over about a five to six-month period, between October 1 and April 1, of the year(s) in which funds become available. The Contractor will be allowed to dredge 24 hours per day, 7 days per week.

The dredge area (including side slopes) in the proposed -10-foot-deep channel covers approximately 126,600 square feet (2.97 acres) of subtidal bottom. The dredge area (including side slopes) in the proposed -8-foot-deep turning basin covers 14,760 square feet (0.33 acres) of subtidal bottom and approximately 26,830 square feet (0.61 acres) of intertidal bottom. The dredging of the channel will impact approximately 40,490 square feet (0.93 acres) of eelgrass and the dredging in the turning basin will impact approximately 6,700 square feet (0.15 acres) of eelgrass. Mitigation is being proposed for the permanent conversion of 26,830 square feet of intertidal bottom to subtidal bottom and the permanent loss of 47,190 square feet (1.08 acres) of eelgrass habitat. Additional mitigation for the temporal loss of eelgrass resources is also proposed. In addition to the eelgrass impacts, biological impacts of the proposed work would consist of a temporary loss of benthic community at the dredging and disposal sites. However, these organisms will be replaced in time by recolonization of species from adjacent areas.

I find that based on the evaluation of environmental effects discussed in this document, the decision on this application is not a major federal action significantly affecting the quality of the human environment. Under the Council on Environmental Quality (“CEQ”) NEPA regulations, “NEPA significance” is a concept dependent upon context and intensity (40 C.F.R. § 1508.27). When considering a site-specific action like the proposed project, significance is measured by the impacts felt at a local scale, as opposed to a regional or nationwide context. The CEQ regulations identify a number of factors to measure the intensity of impact. These factors are discussed below, and none are implicated here to warrant a finding of NEPA significance. A review of these NEPA “intensity” factors reveals that the proposed action would not result in a significant impact—neither beneficial nor detrimental--to the human environment.

> <u>Impacts on Public Health or Safety</u>: The project is not expected to have negative effects on public health and safety. As Great Chebeague Island is only accessible by boat or ferry, the project is expected to increase public safety by providing accessible navigation to the island.

Unique Characteristics: The EA considered the unique characteristics of the site including proximity to historic or cultural resources, parklands, wetlands, and ecologically critical areas and did not uncover significant impacts to the resources that would be impacted by the project activities.

Controversy: The proposed project is not controversial. State and federal resource agencies agree with the USACE impact assessment.

Uncertain Impacts: The impacts of the proposed project are not uncertain; they are readily understood based on past experiences from this project and other similar USACE projects.

Precedent for Future Actions: The proposed project is an improvement dredging action. Future maintenance of the project will be required.

Cumulative Significance: As discussed in the EA, to the extent that other actions are expected to be related to project as proposed, these actions will provide little measurable cumulative impact.

Historic Resources: The project will have no known negative impacts on any pre-contact or historic period archaeological sites recorded by the State of Maine.

Endangered Species: The project will have no known positive or negative impacts on any State or Federal threatened or endangered species.

Potential Violation of State or Federal Law: This action will not violate Federal or state laws.

Measures to minimize adverse environmental effects of the proposed action are discussed in Section 9 of the EA and include seasonal restrictions to avoid estuarine resources and mitigation to offset the loss of 1.08 acres of eelgrass habitat and 0.61 acres of intertidal habitat. Also a haul route to the Portland Disposal Site has been defined to minimize impacts to fishing gear.

Based on my review and evaluation of the environmental effects as presented in the Environmental Assessment, I have determined that the Great Chebeague Island improvement dredging project in Cumberland County, Maine is not a major Federal action significantly affecting the quality of the human environment. This project, therefore, is exempt from requirements to prepare an Environmental Impact Statement.

Date	John A. Atilano II Colonel, Corps of Engineers District Engineer

Great Chebeague Island, Maine
Navigation Improvement Project
Environmental Assessment
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ENVIRONMENTAL ASSESSMENT

1.0 Introduction

The purpose of this Environmental Assessment (EA) is to present information on the environmental features of the project area and to review construction information to determine the potential impacts of the proposed project. This Environmental Assessment describes project compliance with the National Environmental Policy Act of 1969 (NEPA) and all appropriate Federal and State environmental regulations, laws, and Executive Orders. Methods used to evaluate the environmental resources of the area included biological sampling, sediment analysis, review of available information, and coordination with appropriate environmental agencies and knowledgeable persons. This report provides an assessment of the alternatives considered for the proposed project, the environmental impacts of the proposed action, and other pertinent data related to the proposed action.

2.0 Purpose and Need

Chebeague Island, also known as Great Chebeague Island, is located in Casco Bay, an inlet of the Gulf of Maine (Figure EA-1 – see inset). Chebeague Island is a town and one of the 12 major islands of the Calendar Islands in Cumberland County, Maine. Great Chebeague, the largest and most populated island, is the center for town commerce and features a landing and stone pier along the northwest shore, which serves as the town's principal link to the mainland. Town officials report that shallow water depths hinder operation of the many activities that rely on the landing, including commercial fishing, barging, and ferry operations. As the Island's principal landing, its public safety, economy, and vital services all depend on adequate access to the mainland from this point.

The principal navigation issue at Great Chebeague Island is that the existing channel to the Stone Wharf does not accommodate safe and efficient vessel movement to the landing. This wharf is the primary location for year-round ferry and barge service, emergency rescue operations, and commercial fishing. The ferry operations carry school children, commuters, and residents to and from the mainland. Controlling depth in the channel is currently less than five feet at MLLW, which is inadequate for ferries, barges, and other vessels currently using the wharf. These ferries have less than 1-foot underkeel clearance at mean low tide, which is unsafe and places the ferries at risk of damage. Ferries are unable to access the pier during some lower tidal stages. Some minor and localized dredging was conducted by the town in the past to remove high spots to attempt to keep the wharf accessible for ferries at least in higher tidal stages. Emergency situations that occur during mid to low tide periods will severely limit or make unavailable access under current conditions, and these limitations are a serious concern for the Island's public safety.

As the primary docking location for the commercial fishing fleet and barge operations, as well as passenger ferry operations, reliable access to the Stone Wharf is central to the town's economy. Fishing vessels can now access the Stone Wharf for only a few hours on either side of high tide to load supplies and off load their catch. These limitations have led to conflicts among fishermen as there are very limited time and space to load and unload their traps. Deeper draft lobster vessels have run aground approaching the pier when transporting their catch, and the fishing fleet is trending towards using larger vessels as older boats are replaced, thus exasperating the navigational problems.

The Town of Great Chebeague Island has requested that the New England District of the U.S. Army Corps of Engineers (USACE) perform improvement dredging and investigate the potential of establishing a federal channel and turning basin to allow full time vessel traffic to the Great Chebeague Island landing.

3.0 Proposed Project and Authority

The proposed navigation improvements on Great Chebeague Island would create a new channel at the Stone Wharf. The channel would extend from deep water in Casco Bay southeasterly ~1,600 feet to Great Chebeague Island public landing. The channel would be 100 feet wide and dredged to -10 feet deep mean lower low water (MLLW), with widening to 150 feet alongside the pier. An upper turning basin, 0.75 acre in size, between the channel and the boat/barge ramp would also be constructed by dredging to -8 feet MLLW to accommodate vessel maneuvering.

The proposed work consists of improvement dredging of about 34,000 cubic yards of sediments to create a channel and turning basin (Figure EA-1). The dredge material is comprised of mixed gravel, sand, and silt with the silt being located in the outer portion of the channel, the sand being located in the inner portion of the channel, and a gravel and sand mix being located in the proposed turning basin. The work would be performed by a private contractor, using a mechanical dredge and scows, under contract to the government. The dredge will remove the material from the harbor bottom and place the material in scows. The scows will be towed by tug to the Portland Disposal Site (PDS) (Figure EA-2), where the material will be placed at designated locations within PDS.

The dredge area (including side slopes) in the proposed -10 feet deep channel covers approximately 126,600 square feet (2.97 acres) of subtidal bottom. The dredge area (including side slopes) in the proposed -8 feet deep turning basin covers 14,760 square feet (0.33 acres) of subtidal bottom and approximately 26,830 square feet (0.61 acres) of intertidal bottom. The dredging of the channel will impact approximately 40,490 square feet (0.93 acres) of eelgrass and the dredging in the turning basin will impact approximately 6,700 square feet (0.15 acres) of eelgrass. Mitigation is being proposed for the permanent conversion of 26,830 square feet of intertidal bottom to subtidal bottom and the permanent loss of 47,190 square feet (1.08 acres) of eelgrass habitat. Additional mitigation for the temporary loss of eelgrass resources is also proposed.

The work will be accomplished over about a five to six-month period, between October 1 and April 1, of the year(s) in which funds become available. The Contractor will be allowed to dredge 24 hours per day, 7 days per week. Officials from the State of Maine and the Town of Chebeague have requested that this project would then be maintained in perpetuity by USACE as a Federal Navigation Project (FNP).

This report is prepared and submitted under the authority and provisions of Section 107 of the River and Harbor Act of 1960, as amended. Section 107 provides authority for the USACE to improve navigation including dredging of channels, anchorage areas, and turning basins and construction of breakwaters, jetties and groins, and other general navigation features in partnership with non-Federal government sponsors such as cities, counties, special chartered authorities, or units of state or tribal government.

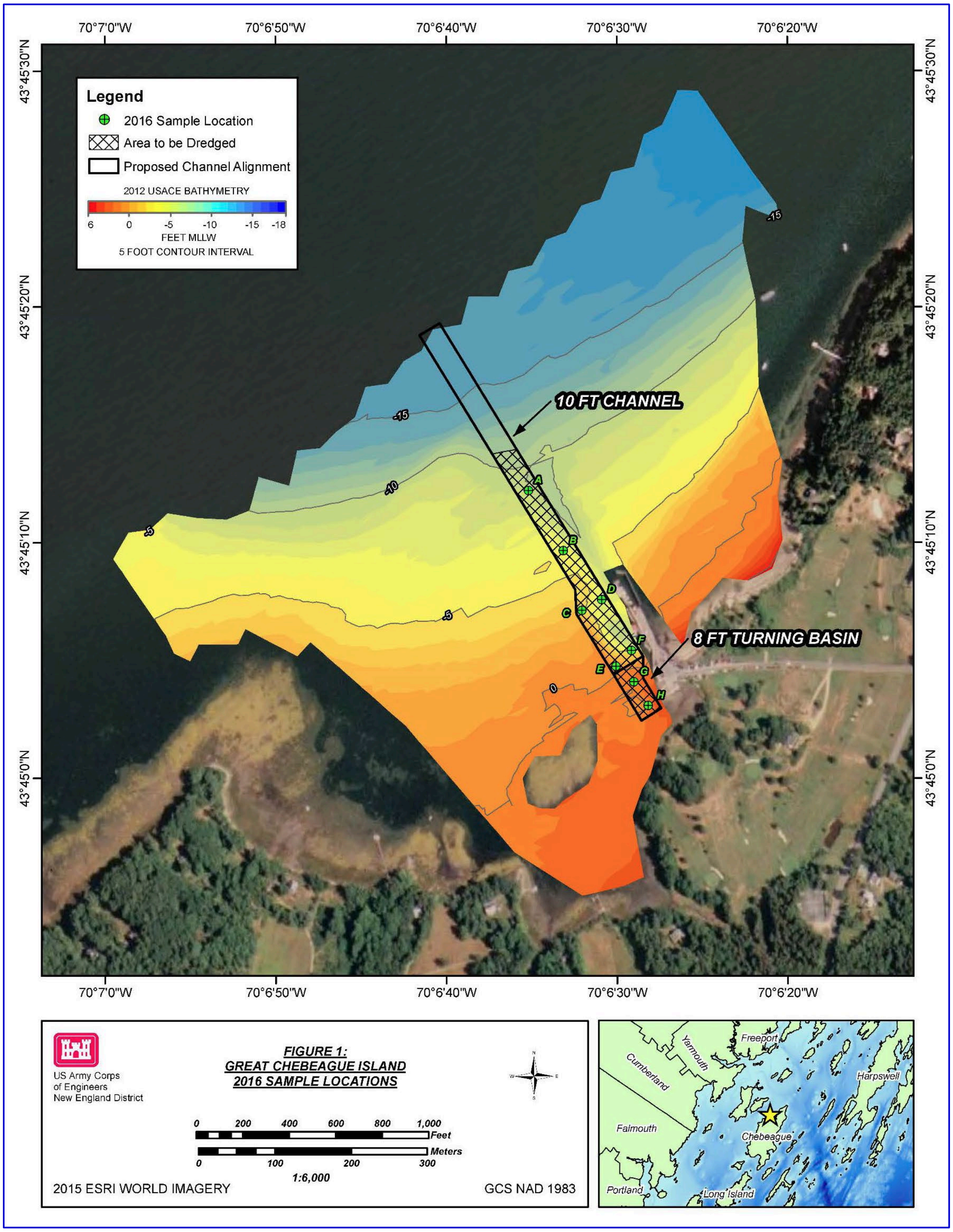


Figure EA-1. Proposed Great Chebeague Island navigation improvement project and 2016 sediment sample locations

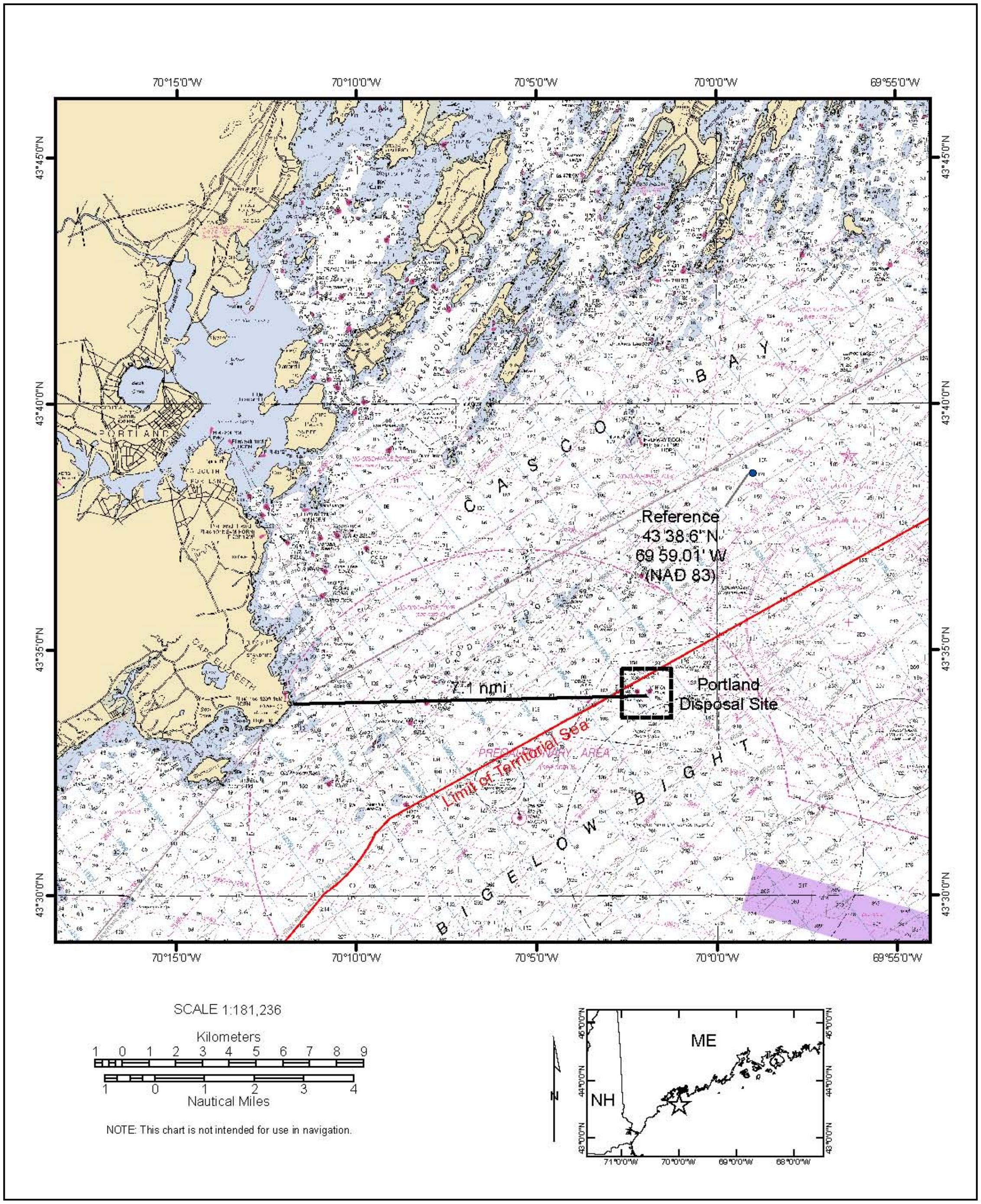


Figure EA-2. Location of the Portland Disposal Site (PDS).

4.0 Alternatives

4.1 No Action Alternative

The No Action Alternative is required to be evaluated as prescribed by NEPA and the Council on Environmental Quality (CEQ). The No Action Alternative serves as a baseline against which the proposed action and alternatives can be evaluated. Evaluation of the No Action Alternative involves assessing the environmental effects that would result if the proposed action did not take place. Under a No Action Alternative, the federal navigation improvement project in Chebeague would not be created. The No Action Alternative would allow existing conditions in the project to continue to deteriorate, resulting in further restricted access of vessels to Chebeague Island and continued hazardous navigation conditions. This adverse condition will result in an increased frequency of groundings and will necessitate tidal delays for the fishing vessels and ferry utilizing the landing. Such conditions can increase the likelihood of vessel accidents, which lead to costly repair bills and potential environmental harm by increasing the potential for oil spills or the release of other hazardous materials into the ecosystem. Due to the safety concerns, the No Action Alternative was rejected.

4.2 Alternative Project Management Measures

Management measures can be identified and evaluated as the basis for formulating alternative plans to solve the navigation problems at Great Chebeague Island. These management measures are categorized as either structural or non-structural.

Structural measures are those that involve the construction of features that would, to varying degrees, meet the planning objectives developed for Great Chebeague Island. These include constructing new Federal general navigation features at the town landing at Stone Wharf. These features would reduce or eliminate tidal delays and the risk of grounding for the fishing fleet, ferry service, and other critical island services.

Nonstructural measures involve those that would achieve the same planning objectives, but without resorting to structural improvements. An example of a nonstructural measure applicable to small fishing harbors involves the transfer of commercial fishing vessels to neighboring ports having capacity to sufficiently accommodate additional vessels at existing facilities. These are discussed in the general consideration of alternatives below. Costly non-structural solutions such as relocation of the island’s residents or fishing fleet off island, or construction of a bridge to the mainland, were not considered because of unreasonable costs and practicability.

Navigation improvement measures were developed and analyzed during the early stages of the planning study. These measures included both nonstructural measures, including the possibility of transferring vessels to neighboring ports, and structural measures (various dredging options).

4.2.1 Non-Structural Measures

Fleet Transfer: This would include transfer of some of the larger fishing vessels to nearby harbors on the mainland such as Royal River in Yarmouth or Falmouth Harbor. As lobstering is a key component of the Chebeague Island economy, so transferring the fleet to another port would also make sustaining the island community very difficult. Transfer of the ferry to other seasonal landing areas on the island would reduce this service to a seasonal operation. Without the ferry to provide year-round transportation to and from the island, maintaining a year-round population on Great Chebeague Island would be impossible. Children beyond K-5 are now educated on the mainland, relying on the ferry for daily access. Emergency services that rely on the ferry would also be compromised in colder months. Transfer of services and uses at the town landing at Stone Wharf to either of these other two areas on the island with making significant structural improvements needed for safe year-round navigation would not meet the island's needs or the planning objectives. These measures were therefore eliminated from further consideration.

Tidal Navigation: Tidal navigation is presently practiced by most of the fishing fleet at Great Chebeague Island. Larger fishing boats in particular must pay close attention to the tides which vary throughout the day, month, and year. New England experiences a semidiurnal tide; in general, there are two high tides and two low tides every 24 hours and 50 minutes. The highs and lows (and therefore range of the tide) can vary considerably from one tidal cycle to the next. Extreme low water is as much as one foot below MLLW. Experienced fishermen understand the tides in the areas they operate and pay attention to the tide charts. Even so, the effects of storms, waves, swells, surges, currents, winds and other factors all contribute to uncertainties in navigating shallow coastal waters and harbors. Groundings can occur when deeper draft boats are operated without sufficient underkeel clearance to account for the conditions mentioned above.

Tidal navigation results in delays accessing shore facilities when leaving and entering the harbor. The ferries leave both Great Chebeague and Cousins Island with passengers and freight. Fishing boats leave the harbor loaded down with provisions, ice, fuel, and bait, and return to the harbor loaded down with catch on ice. When loaded draft (plus a reasonable underkeel clearance for sea and channel conditions) exceeds the available controlling depth in the channel, then groundings occur. The only solution short of dredging is to delay the channel transit, which costs the fishing boats time, and - if inbound - fuel and labor. Tidal navigation would delay the ferries and make maintaining a regular service schedule very difficult.

At Great Chebeague Island, the Sponsor requested the USACE to examine constructing a Federal navigation channel to alleviate tidal delays and groundings. Further reliance on tidal navigation would fail to address the problems experienced by the fleet. Problems with access would only continue to worsen as shoaling of the channel and along the pier continues.

4.2.2 Structural Measures

Structural measures for navigation improvements were analyzed in this study that could help meet the planning objectives. Navigation improvements can improve access to existing shore facilities or involve construction of new measures that would create better protection for development of new shore facilities. Access improvements include dredging of channels, turning basins, and anchorage areas to address inadequate depths for safe navigation and improvement access. Other structural improvements such as breakwaters can create new protected harbors at sites that would otherwise be unsuitable for year-round access.

At Great Chebeague Island, navigation safety and access at the existing town landing at Stone Wharf could be improved by dredging new access features. Elsewhere on the island, either of the two alternative landing areas discussed under the non-structural fleet transfer above could be made into year-round access sites through construction of breakwaters and new heavy-duty access facilities.

Improvements at the town landing at the Stone Wharf would involve dredging of a channel and turning basin to improve access to the wharf, and additional dredging of anchorage areas to allow the fleet to anchor closer to the wharf. Consultation with the Town and State agencies led to the development of two combinations. The first would be limited to dredging a channel and turning basin to improve access to the wharf and ramp at the landing to provide safe, all-tide access to the landing for the ferry, barge services, and commercial fishing fleet. The second would add dredging of two anchorage areas similar to those recommended in the 1973 report to allow the fleet better access to the landing and room to expand in the future.

Construction of a new public landing at the central landing site on the east shore of the island would require a new offshore breakwater to shelter the site, construction of a new heavy-duty wharf and ramp to accommodate the need for a ferry terminal and barge ramp, and dredging a channel and turning basin to provide access to shore facilities. Similarly, development of the landing site at Chandler Cove, on the southeast end of the island, would require a shorter breakwater extending west from the point to shelter the cove from southerly seas and winds in the winter. In addition, development at Chandler Cove would require replacement of the existing timber dock with a more heavy-duty landing to accommodate year-round ferry and barge services, and potential dredging improvements to make those facilities accessible at all tides.

The combination of these different structural measures into the initial alternatives outlined above, and the practicability of each are discussed in the following sections.

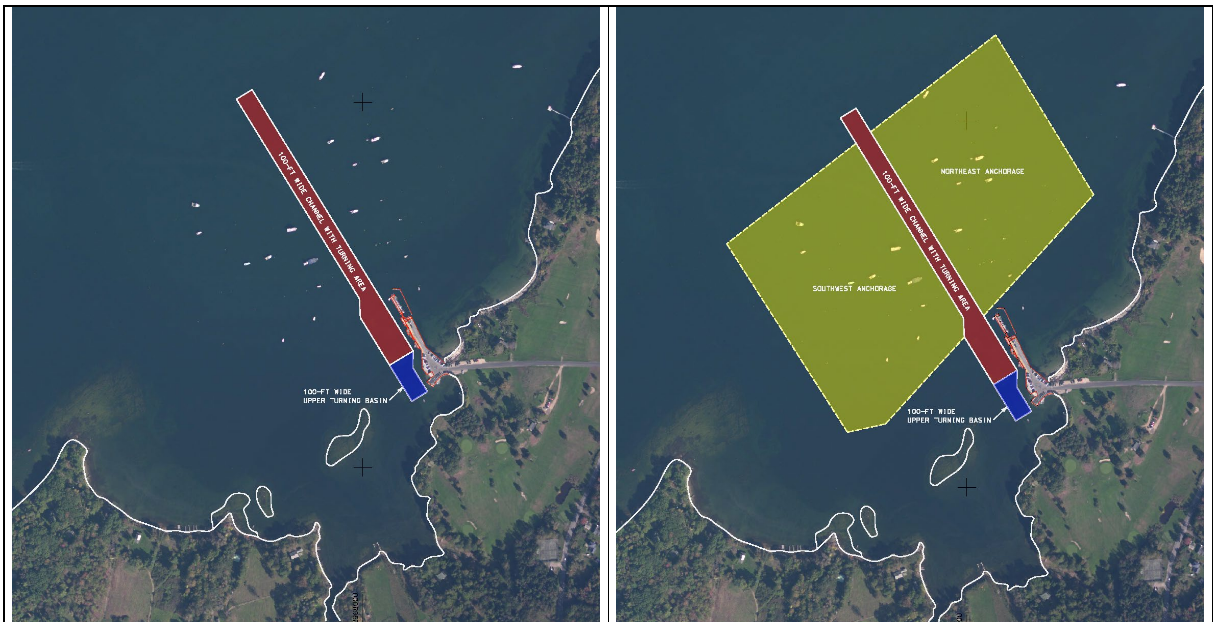
4.3 Development and Analysis of Initial Alternatives

As discussed above, management measures for improving safe year-round navigation for Great Chebeague Island were combined into initial alternatives. The alternatives were screened to determine the extent to which each contributed to achieving the planning objectives with consideration of the identified planning constraints. Those alternatives that survived this initial screening, were then carried forward for more detailed development and evaluation as detailed plans, including specific analysis of detailed costs, impacts, and benefits.

The first two of these initial alternatives address the Town's desire for improvements at the town landing at Stone Wharf. Two additional alternatives for more extensive harbor improvements at other areas on the island were also evaluated.

4.3.1 <u>Alternatives Considered and Carried Forward for Further Analysis</u>

The first two alternative investigated involved constructing a channel and turning basin to access and utilize the existing town landing at Stone Wharf at Great Chebeague Island (Plan A), and the addition of dredged anchorage areas to the plan for a channel and turning basin (Plan B). These plans are shown in Figure EA-3.



Plan A – Channel with Turning Basin | Plan B – Channel, Basin, and Anchorages

Figure EA-3 – Great Chebeague Island, Maine
Development of Alternative Plans

Plan A involves constructing a new federal navigation channel 100 feet wide from deep water in Casco Bay, southeasterly, approximately 1,600 feet to Great Chebeague Island public landing at the Stone Wharf, widened to 150 feet alongside the pier to accommodate turning of the ferry. An upper turning basin between the channel and the boat/barge ramp would also be constructed to accommodate maneuvering of barges. Based on the size of the fishing vessels, barges, and ferries, the channel width of 100-150 feet was chosen. For this measure a large range of channel and turning basin depths were considered. The design depths initially considered for the channel and turning basin range from six feet to 12 feet below MLLW.

These alternative depths address the varying abilities of vessels to maneuver during the range of tidal conditions encountered.

The town landing at Stone Wharf is the closest landing on the island to the mainland terminal on Cousins Island, a distance of about 1.7 miles by vessel. This site is also the only landing located on the island's sheltered (lee side) western shoreline, making this a year-round access point for all island services. Stone Wharf also has the island's only heavy duty wharf and its only paved ramp.

Plan B was examined in some detail in the Federal Interest Determination (FID). That plan would have added dredged anchorage areas both north and south of the channel and wharf and were included in the project recommended in the 1973 Detailed Project Report. Plan B, with its far larger dredge area, carries a much higher cost than Plan A with only the channel and turning basin. The anchorage areas are also significant eelgrass habitat, which would be removed by any dredging. The town decided during review of the FID to eliminate further consideration of anchorage areas in the remaining feasibility investigation. The beliefs that a draft-focused mooring plan, together with the channel and turning basin improvements of Plan A, would provide the fishing fleet and other open-moored small craft with adequate all-tide access to the shore facilities they depend on. Further not dredging anchorages would avoid the impacts to eelgrass beds which are important to the long-term health of the Bay's environment and the fishery resources the island's economy and it commercial fleet depends on.

4.3.2 Alternatives Considered and Eliminated From Further Analysis

Two other measures were initially evaluated to improve navigation within the project area but were rejected from further analysis. These measures involved channel improvements and new shore facilities at two different existing seasonal docking areas on Great Chebeague Island.

Plan C: The first additional docking area considered was the landing at Chandler Cove, which has a wooden pier and is used seasonally by the Casco Bay Line interisland ferry. This cove is exposed to the south to winds and storms from the Atlantic during the late fall to early spring seasons. The timber pier at the cove can support access to small vehicles but is insufficient for use for heavy freight. There is limited barge landing of smaller commercial vehicles over the beach to the south of the Cove using planks in lieu of a ramp (observed during site visit). For this site to be developed as a year-round landing, a new heavier duty pier and boat/barge ramp would be required, as well as parking facilities and some form of storm protection (breakwater or wave attenuation structure). Additionally, Chandler Cove is farther from the Cousins Island wharf (about 5.8 miles, more than three times the distance of Stone Wharf), and so the ferry ride would be longer.

Plan D: The second alternative landing area considered was the central landing area on the east side of the island, where the existing boatyard has a small dock for small, recreation vessels. This area is completely exposed to the easterly weather coming from the Atlantic and the Bay. A year-round facility there for the ferry, fishing fleet, and freight barges would not be possible without construction of a breakwater to shelter the area and construction of a new public landing with road access, wharf, a paved ramp, and parking. Additionally, it would require traveling all the way around Great Chebeague Island to get to the Cousins Island ferry dock, about 5.1 miles by vessel, three times the distance of Stone Wharf.

Both of these alterative locations were deemed impracticable for the needs of the project due principally to the extent of shore facilities modifications that would need to be made, the increased distance to the island's mainland access terminal at Cousins Island, and the need for wave and storm protection structures to make the sites usable year-round, and were therefore eliminated from further consideration. Dredging and breakwater construction would have significant impacts on eelgrass resources in both these areas, though more so at the central landing site (see Figure EA-4).

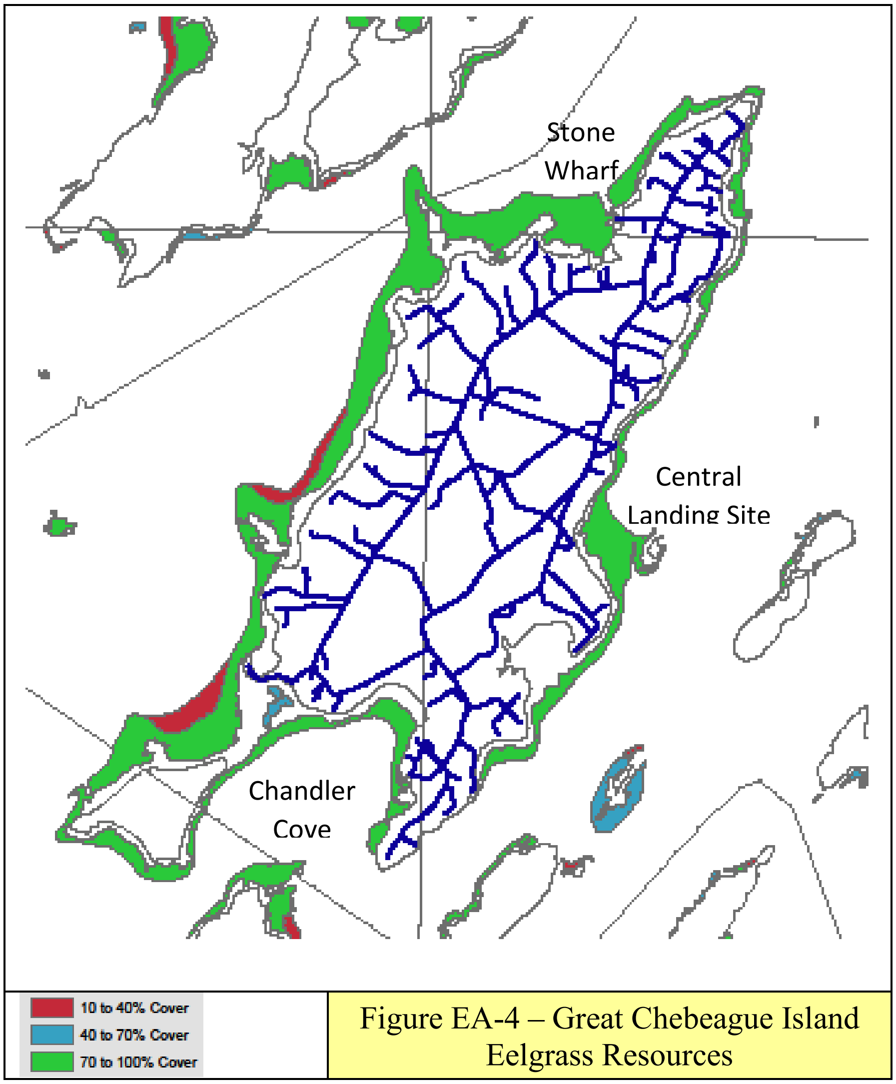


Figure EA-4 – Great Chebeague Island Eelgrass Resources

4.4 Alternative Dredging Methods

The various types of dredging plant and dredging methods that were considered for this project include: a mechanical dredge, a hydraulic pipeline dredge, and a hopper dredge. In general, the logistics of the project dictate the type of dredge plant selected for the work. These factors include but are not limited to the following: environmental concerns, the size and location of the area to be dredged, time of year restrictions, weather conditions, nature of the material to be dredged and most importantly, the proposed disposal site.

4.4.1 Hydraulic Dredge

4.4.1.1 Cutterhead Pipeline Dredge

A hydraulic dredge consists of a cutterhead on the end of an arm connected to a pump, which loosens the bottom sediments and entrains them in a water slurry that is pumped up from the bottom. The material is then discharged away from the channel (side cast), or is pumped via a pipeline to a dewatering area or disposal site. A hydraulic dredge is generally used for sandy material that will be disposed of in an upland area or on a nearby beach, or for pumping any type of unconsolidated material into a confined (diked) disposal/dewatering area. As the material from the proposed project is not suitable for beach disposal because it contains a significant amount of silt and there are no available upland disposal sites, hydraulic pipeline dredging is not considered an appropriate type of dredge for this work. As such, the use of a hydraulic pipeline dredges was eliminated as an alternative for the proposed effort.

4.4.1.2 Hopper Dredge

A hopper dredge is a type of hydraulic dredge that uses a suction pump to loosen and remove material from the bottom. The dredged material is then deposited into hoppers aboard the dredge vessel. As pumping continues, the solid particles settle while excess water and some material passes overboard through troughs. When the hoppers are full, the drag arm is raised and secured to the vessel, which then travels to the disposal site and releases or pumps off the material from the hoppers. The dredge then returns to the dredging site to begin another cycle. Hopper dredges come in various sizes from a few hundred cubic yards bin capacity to several thousand yards bin capacity. In order to fill the hopper bins, the water component of the suctioned slurry is allowed to overflow the bins back into the harbor at the dredging site. In New England, hopper dredges are most often used to remove sandy material from harbor entrance channels and deposit the material offshore of beaches to nourish littoral bar systems. As the material from the proposed project contains a significant amount of silt and the distance to the preferred disposal site (PDS) is approximately 15 miles away, the use of a hopper dredge is not considered an appropriate type of dredge for this work. As such, the use of a hopper dredge was eliminated as an alternative for the proposed effort.

4.4.2 Mechanical Bucket Dredge

Mechanical bucket dredging involves the use of a barge-mounted crane, backhoe or cable-arm with a bucket to dig material from the bottom. Typical dredging buckets come in various sizes from five or so cubic yards to fifty or more cubic yards. A mechanical dredge is well suited to work in tight quarters such as small harbors and in and around berthing areas and slips. The dredged material generated from bucket dredging is generally placed in a scow for transport to a disposal site by tug. For open-water or ocean disposal, a split-hull scow is generally used for ease of disposal and to minimize the discharge plume. Although there may be some overflow of water from the scow to maintain efficiency during dredging, it is minimal in comparison to hopper dredge activities. Material is typically discharged within a placement area at preset coordinates monitored by the tug. This point-dumping is intended to form a discrete mound of dredged material at the disposal site to minimize off-site migration and assist in monitoring the placement operation and post-disposal activities at the placement site.

A mechanical bucket dredge is proposed and recommended for this project due to the nature of the material (sediments composed of mixed gravel, sand, and silt) to be removed and the lack of suitable upland placement or dewatering areas (as discussed below). The material proposed to be dredged from the Great Chebeague Island navigation improvement project has been found suitable for unconfined open water placement and will be brought to the PDS for final placement.

4.5 Placement Alternatives

Placement of dredged material generally occurs at upland sites, beaches, nearshore sites, or ocean sites. Factors in selecting a practicable disposal site include: the amount of dredged material for disposal, contamination levels in the sediment, the physical nature of the sediment, cost, logistics, and the environmental impacts of material placement. The placement alternatives for the material to be dredged from the Great Chebeague Island navigation improvement project are discussed below.

4.5.1 Upland Placement

Upland placement of the dredged materials would require extensive re-handling of the material, which would have to be dredged from the harbor, transferred ashore, dewatered in an area adjacent to the harbor, and then loaded onto trucks and taken to an upland disposal area. Dewatering would require construction of a diked containment to hold the dredged material and dewatering of the material would take several months and potentially up to one year. The town was consulted during the study on opportunities for upland placement and beneficial use of the dredged material. There is no appropriate dewatering area near the Town Landing at Stone Wharf. The area around the pier for more than 1,000 feet in all shoreward directions is a municipal golf course and private residences. The former town landfill and current recycling and transfer station is located a little more than two miles from the Stone Wharf. Marine sediment placed upland may impact the island's aquifer, the source of all potable water on the island. If the material is not needed on the island, or cannot be permanently placed onshore, then it would have to be moved by scow to the mainland. Given the excessive amount of rehandling, lack of available area for dewatering, and issues with placement of marine sediment upland, this dredged material placement option is not being considered as an alternative.

4.5.2 Beach Nourishment

The material proposed to be dredged from the Great Chebeague Island navigation improvement project is comprised of a mix of gravel, sand, and silt. The majority of the material to be dredged from the proposed project is a represented by material that is 50% sand and 50% silt (see samples A, B, C, D, and F in Table EA-1) and is not considered suitable to be used for beach nourishment. The material from the turning basin is predominately sand (Stations E, G, and H in Table EA-1), however the volume is relatively small compared to the overall volume of material. Using this material for beach placement would add significant costs to the project and make it impracticable. Therefore, the beach placement alternative for the proposed project was rejected as a viable placement alternative.

4.5.3 Nearshore Placement

This alternative would involve the placement of the dredge material in nearshore areas from which it can be moved by littoral processes onto a beach, thereby providing a source of material for beach nourishment. As noted above, fine material such as silt and larger substrates like gravel are not suitable for beach nourishment. This placement alternative was therefore rejected as the majority of dredge material from the proposed project contains significant amounts of fine-grained material. Additionally, the nearshore subtidal environments surrounding Great Chebeague Island are dominated by eelgrass beds, which could be impacted if the material was placed nearshore.

4.5.4 Unconfined Open Water Placement

Portland Disposal Site (PDS) is the closest open water placement site to Great Chebeague Island, located approximately 15 nautical miles to the south-east of the project area. The PDS is an U.S. Environmental Protection Agency (EPA) designated ocean dredged material disposal site, meaning it is an open water site that can receive suitable dredged material with approval from the EPA. The PDS can receive all types of dredged materials so long as various suites of chemical and biological testing and modeling determine a sediment's toxicity and its potential for ecological and health risks. Based on the results of chemistry testing and bioassay/bioaccumulation testing, the USACE and the EPA have determined that the proposed dredged material from the Great Chebeague Island project is suitable for unconfined open water placement. As all other placement methods have been considered to be impracticable, the placement of dredged material from the proposed project at the PDS is the preferred placement alternative for the proposed action.

5.0 Affected Environment

5.1 Dredge Site

The Town of Chebeague Island includes seventeen islands and their adjacent waters. These include the islands of Bangs, Bates, Hope, Ministerial, Sand, Stave, Stockman, and the tiny Upper Green Islands. It is located 10 miles from Portland, Maine. Chebeague Island is the largest island in Casco Bay that is not connected to the mainland by a bridge.

The Town of Chebeague Island (Chebeague) has requested that the USACE establish a federal channel to allow full time vessel traffic to the Chebeague Island landing. In order to accomplish this, a 0.75 acre turning basin and a 100 to 150 feet wide channel extending approximately 1,600 feet from the stone pier northwest to deep water would be required (Figure EA-1). The dredged depths for the turning basin and channel would be 8 and 10 feet, respectively, at mean lower low water (MLLW), plus one foot of allowable overdepth.

5.1.1 <u>Physical and Chemical Environment</u>

Tides and Water Quality

The mean tidal range at Great Chebeague Island is approximately nine feet (NOAA, 2018). The surrounding waters of Casco Bay are classified by the State of Maine Department of Environmental Protection as "SB." 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.

Based on a review of historic data and communication with local officials, it has been determined that there are no known outfalls or recent spills in the vicinity of the project area. The closest waste water treatment plant is located in Yarmouth on Cousins Island, approximately 1.25 miles northwest of Chebeague Island. There are no wastewater treatment plants, treatment facility outfalls, or CSO outfalls located on Chebeague Island. All of Casco Bay is a State of Maine No Discharge Area. One marine boat pump-out station is located slightly off the eastern coast of Chebeague Island, a self-service float, north of Waldo Point.

Sediment Quality

Approximately 34,000 cubic yards of material is proposed to be dredged to create the channel and turning basin for the improvement project. Physical, chemical, and biological tests were performed on this material to determine its suitability for unconfined open water disposal.

Sediment core samples were collected from eight (8) locations in April 2017 within the proposed dredge location (Figure EA-1). Grain size analysis was run on all samples. The results showed that the material was comprised of mixed gravel, sand, and silt (Table EA 5-1). Sediments at the sediment-water interface (i.e., surficial sediments) are predominantly sand or silty-sand. Samples from the outer portion of the proposed channel (Stations A, B, C, D, and F) had large fractions of fine-grained material (45% - 54.1% fines). Stations from the inner portion of the proposed channel and the turning basin (Stations E, G, and H) were predominately sand with some gravel and fine-grained material.

Table EA-5-1. Grain Size for Great Chebeague Island Sediment Sampling Locations

Sample ID	% Gravel	% Coarse Sand	% Medium Sand	% Fine Sand	% Fines
A	1.0	3.4	14.9	35.7	45.0
B	0.2	2.7	9.1	37.5	50.5
C	0.4	2.2	7.6	35.7	54.1
D	0.1	2.2	6.6	37.8	53.4
E	2	4.6	15.2	62.7	15.5
F	0.1	0.6	8.3	40.4	50.6
G	1.9	5.7	24.6	56.6	11.2
H	24.4	14.9	21.4	22.1	17.2

Based upon the grain size, the sample sites were combined into three composite samples for chemical testing. The composites consisted of AB, CD, and F. Samples E, G, and H were excluded from sampling as they were composed predominantly of sand. The composite sediment samples were tested for grain size, metals, polychlorinated biphenyls (PCBs), pesticides, polynuclear aromatic hydrocarbons (PAHs), and total organic carbon (TOC). Results of the chemical testing are presented in Tables EA 5-2 to 5-4 below.

To examine the project sediment concentrations in an ecologically meaningful context USACE screened the values with Sediment Quality Guidelines (SQGs). Applicable SQG screening values for marine and estuarine sediments are the National Oceanic and Atmospheric Administration (NOAA) effects-range low (ERL) and effects-range median (ERM). ERL/ERM values are empirically derived guidelines that identify contaminant levels that indicate when toxic effects are unlikely (ERL) and when an increased probability of toxic effects is evident (ERM). These SQGs serve as a useful screening tool to inform the sampling and testing process; but to evaluate the Great Chebeague Island Landing navigation improvement project under Marine Protection, Research, and Sanctuaries Act, the suitability determination is based on the results of the biological testing presented in the subsequent sections.

Bulk chemistry results showed detectable levels of trace metals, with the exception of mercury, in the three composite samples but at concentrations that were well below the ERL (Table EA 5-2). There were also detectable concentrations of individual polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) in the composite samples but Total PAHs and Total PCBs were also well below the ERL (Table EA 5-2). There were no detected pesticides in any of the composite samples (Table EA 5-2).

Table EA 5-2. Bulk Sediment Chemistry Results from the Great Chebeague Island Landing with Sediment Quality Guidelines

		AB	CD	F	ERL	ERM
Arsenic	mg/kg	6.2	5.6	9.8	8.2	70
Cadmium	mg/kg	0.5	0.6	0.6	1.2	9.6
Chromium	mg/kg	24.3	25.2	41.8	81	370
Copper	mg/kg	10.0	11.3	28.7	34	270
Lead	mg/kg	7.5	8.3	24.8	46.7	218
Mercury	mg/kg	ND	ND	ND	0.15	0.71
Zinc	mg/kg	41.6	39.8	82.2	150	410
HMW PAH	ug/kg	73.7	429.4	1111.1	1700	9600
LMW PAH	ug/kg	35.0	93.5	326.0	552	3160
Total PCB	ug/kg	8.0	18.3	13.5	22.7	180
Total DDT	ug/kg	ND	ND	ND	1.58	46.1

HMW = High Molecular Weight, LMW = Low Molecular Weight
ERL = Effects Range Low, ERM = Effect Range Median
ND = Non-detect

Biological Analysis of Sediments

Samples for subsequent biological testing were collected from the project area in October 2017. Samples were collected from all three composite locations noted above in order to determine the potential for the dredged sediment to cause adverse effects to the biological receptors identified in a conceptual site model for the project (see Suitability Determination – Appendix H). Sediment toxicity was measured through a 10-day whole sediment acute toxicity test, human health risk was determined through a 28-day bioaccumulation test, and water column toxicity was determined through a suspended particulate phase test as described in the Evaluation of Dredged Material Proposed for Ocean Disposal Testing Manual (Green Book, EPA/USACE 2012).

Evaluating Potential Effects to Benthic Organisms

Mean mortality in the control samples of the 10-day whole sediment acute toxicity tests were less than 10% for the amphipod (*Leptocheirus plumulosus)* and the mysid (*Americamysis bahia)*; therefore the tests were valid based on criteria established in the testing protocol. Mean survivability for *L. plumulosus* ranged from 91% to 93% for the three composite samples and was not statistically different when compared to survivability in the Portland Disposal Site (PDS) reference sediment. The material proposed to be dredged is not considered acutely toxic to the amphipods used in this assessment.

Mean survivability for *A. bahia* ranged from 93% to 97% for the three composite samples and was not statistically different when compared to survivability in the PDS reference sediment. The material proposed to be dredged is not considered acutely toxic to the mysids used in this assessment. Results from the 10-day whole sediment toxicity test are summarized in Table EA 5-3.

Table EA 5-3: Mean Survivability in the 10-day Whole Sediment Toxicity Test

Organism	Lab Control	PDS REF	Composite AB	Composite CD	Composite F
Americamysis bahia	92%	90%	93%	97%	93%
Leptocheirus plumulosus	98%	92%	91%	93%	93%

Evaluating Potential Risk to Human Health

In order to assess the potential risk to human health through the potential exposure pathways identified in the Conceptual Site Model, a 28-day bioaccumulation test was performed with the clam *Macoma nasuta* and marine worm *Nereis virens.* Results showed statistically significant increases of certain metals in tissue samples from clams exposed to project sediments when compared to tissue samples from clams exposed to reference area sediments including cadmium, mercury, and zinc. There were no significant increases in tissue samples from worms exposed to project sediments when compared to tissue samples from worms exposed to reference area sediments. Based on these results, USACE analyzed the tissue burden data with the EPA Bioaccumulation Evaluation Screening Tool (BEST) model to determine the toxicological significance of bioaccumulation from exposure to the dredged sediment.

The BEST model includes an evaluation of the non-carcinogenic risk, carcinogenic risk, and any observed exceedances of Food and Drug Administration (FDA) thresholds to determine potential adverse impacts to human health from the consumption of lobster, fish, or shellfish exposed to project sediments. Modeling based on the tissue contaminant loads measured in the Great Chebeague Island Landing navigation improvement project found that all contaminants were below the EPA Hazard Quotient for non-carcinogenic risk of 1.0, below the EPA carcinogenic risk threshold (1×10^{-4}), and were also less than established FDA action levels. BEST model outputs are provided in Appendix H.

Evaluating Potential Effects to Fish and Marine Invertebrates

The conceptual site model identified the uptake of contaminants from the water column during the placement of dredged material at the PDS as a primary exposure pathway for project sediments. NAE determined the potential for water column toxicity though a suspended particulate phase toxicity test as described in the Green Book (EPA/USACE 1991).

NAE used results from the suspended particulate phase toxicity analysis to determine the median lethal concentration (LC_{50}) for three target species exposed to the sediment elutriates. The mysid *Americamysis bahia,* the minnow *Menidia beryllina,* and the urchin *Arbacia punctulata* showed no adverse effects on survival after exposure to the elutriate from Composite AB with LC_{50} values of >100%. The mysid and the minnow also showed no adverse effects on survival after exposure to the elutriate from Composite CD but the urchin did sustain a negative effect on larval survival with an LC_{50} of 23%. All three organisms sustained a negative effect on survival after exposure to the elutriate from Composite F with LC_{50} values that ranged from 3%-76%. Results from the suspended particulate phase test are presented in Table EA 5-4.

Table EA 5-4: LC_{50} Values in the Suspended Particulate Phase Toxicity Test

Organism	Composite AB	Composite CD	Composite F
Americamysis bahia	>100%	>100%	43%
Menidia beryllina	>100%	>100%	76%
Arbacia punctulata	>100%	23%	3%

The Limiting Permissible Concentration (LPC) for disposal in Federal waters is defined in the RIM (EPA/USACE 2004) as 1% of the lowest LC_{50} or 0.03% for the Great Chebeague Island Landing navigation improvement project based on the lowest LC_{50} for *A. punctulata*. To determine if the discharge of dredged material would attain compliance with water quality criteria NAE utilized the Short-Term Fate (STFATE) numerical model to analyze the physical behavior of the disposal cloud as it descends through the water column after release from a scow. Results of the STFATE evaluation predicted that the water column would attain the LPC within four hours of disposal of up to 4,000 cubic yards of material at the PDS and therefore meet the criteria in the RIM (EPA/USACE 2004).

Suitability Determination

According to 40 CFR Chapter 1 Subpart G – Evaluation and Testing § 230.60 General Evaluation of Dredged or Fill Material the coarse grained material from Stations E, G, and H meet exclusionary criteria of dredged material, composed primarily of sand or gravel from a high-energy coastal area that is not likely a carrier of contaminants. The material from these portions of the Great Chebeague Island Landing navigation improvement project are suitable for unconfined open water disposal as proposed without further testing.

Based on the results of biological testing and subsequent risk modeling, no significant adverse impacts through the exposure pathways identified in the conceptual site model were found for the fine-grained material of the Great Chebeague Island Landing navigation improvement project. Based on the testing and evaluation requirements set forth in Section 103 of the MPRSA the sediments to be dredged from the Great Chebeague Island Landing navigation improvement project are considered suitable for unconfined open water disposal at PDS.

5.1.2 Biological Environment

The Chebeague Island navigation improvement project is located in Casco Bay. The majority of biological resources in the channel and basin are marine and estuarine tolerant species.

5.1.2.1 Wetlands and Shoreline Habitats

Great Chebeague Island wetland and nearshore habitats areas are characterized (at low tide) as having extensive mudflats, sandflats, fringing spartina and phragmites marshes, and shallow, forested slopes that grade into upland forest. These wetland areas are located adjacent to the proposed project footprint, which is located exclusively in shallow subtidal waters.

5.1.2.2 Eelgrass

The State of Maine Department of Marine Resources (MEDMR) periodically maps the eelgrass resources of the state. MEDMR eelgrass mapping data from the 1990s and the 2000s (Figure EA-5) shows that the majority of the shallow subtidal waters surrounding Great Chebeague Island contain eelgrass beds (MEDMR, 2020).

Figure EA-5. Distribution of Eelgrass in the Vicinity of Great Chebeague Island.

In July 2017, the USACE performed a hydroacoustic and video survey of the Great Chebeague project area to document eelgrass resources that may occur in the proposed project footprint. Figure EA 6 shows the result of the USACE eelgrass survey overlain on the proposed project footprint (side slopes are not shown on this figure). The total amount of eelgrass within the proposed project footprint (including side slope areas) is 47,190 square feet (1.08 acres). The complete eelgrass survey report is attached to this document as Appendix G.

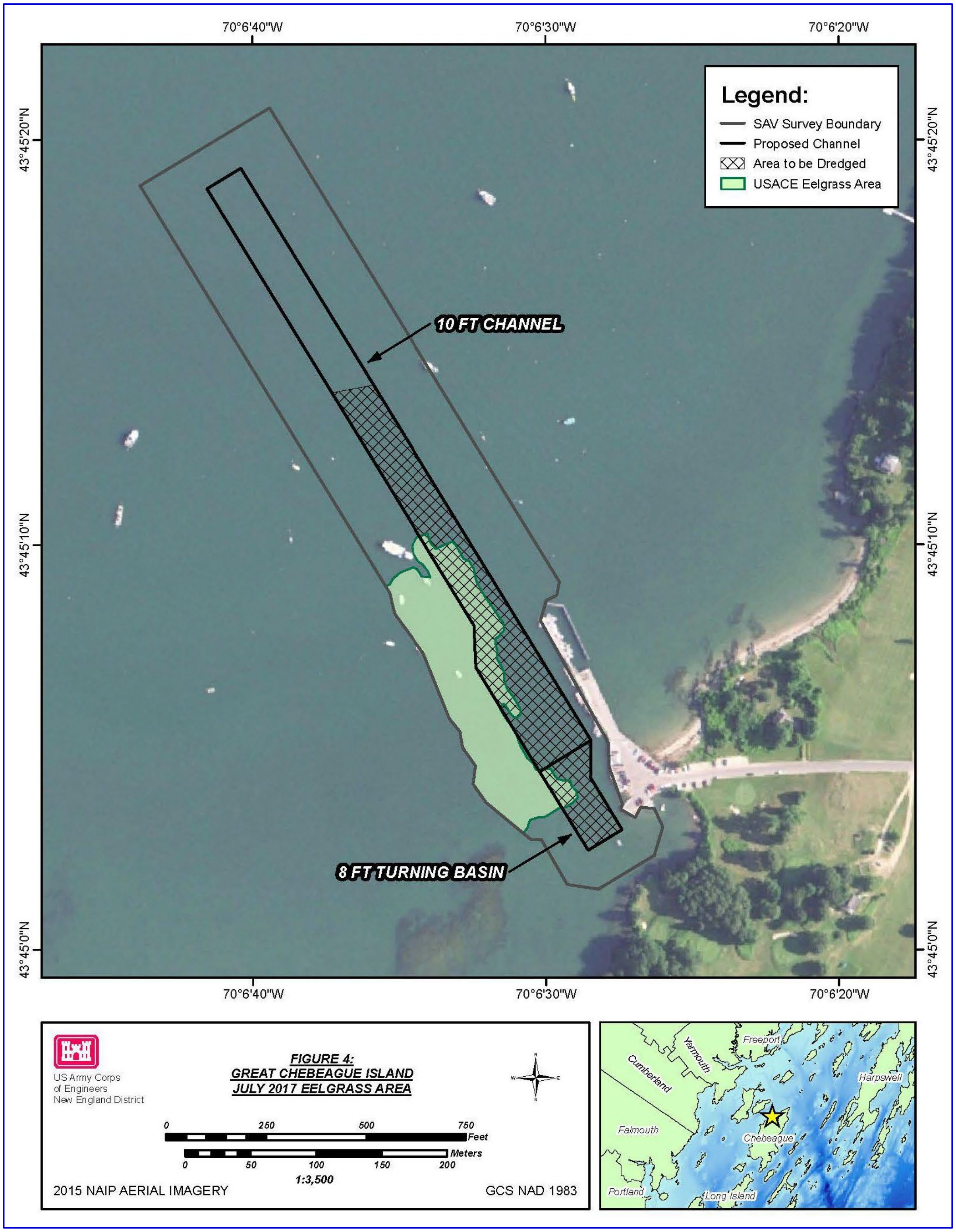


Figure EA-6. Eelgrass Resources Within and Adjacent to the Proposed Project Footprint.

5.1.2.3 Benthic Community

A survey to document the benthic community within the proposed project footprint was performed on July 18, 2017. At each of five stations, a 0.04 m^2 VanVeen grab was used to collect a single replicate sample. Samples were washed through a 0.5 mm sieve, stained, and preserved in the field. In the laboratory, the samples were sieved through a 0.5 mm screen, sorted, identified to the lowest possible taxonomic category, and enumerated. Results of the survey are displayed in Table EA 5-5.

Table EA 5-5. Benthic Invertebrates Collected from the Great Chebeague Island Navigation Improvement Areas in July, 2017. Numbers are per 0.04 m^2

STATION NUMBER	1	2	3	4	5	6
ANNELIDA						
POLYCHAETA						
Clymenella torquata	-	4	3	-	N	1
Glycera dibranchiata	1	6	3	6	O	3
Lumbrineris spp.	-	4	-	-		-
Mediomastus ambiseta.	-	4	2	1	S	3
Neanthes virens	2	-	-	2	A	1
Nephtys picta	2	4	2	-	M	-
Paraonis spp.	-	7	5	44	P	31
Spio setosa	14	1	-	-	L	-
Streblospio benedicti	2	15	8	3	E	8
ARTHROPODA – CRUSTACEA						
AMPHIPODA						
Unidentified Ampeliscidae	1	-	1	1		1
Leptocheirus pinguis.	-	-	-	1		-
CUMACEA						
Diastylus spp.	-	-	-	2		-
MOLLUSCA						
BIVALVIA						
Pitar morhuanna	-	-	-	-	-	1
Tellina agilis	-	20	-	4		3
Solemya velum	2	-	-	-		-
NEMERTEA						
Cerebratulus spp	-	1	-	-		-
INDIVIDUALS / SAMPLE	**24**	**66**	**24**	**64**		**52**
SPECIES / SAMPLE	**7**	**10**	**7**	**9**		**9**

The benthic communities of the improvement areas in the Great Chebeague Island landing area contained a mix of both stable community benthic species (*Clymenella torquata* and *Tellina agilis*) and opportunistic benthic species (*Streblospio benedicti*). The species noted in Table EA 5-5 represent that of a typical fine sand/silt environment dominated by deposit feeders. The benthic communities in these sandy-silty sediments ranged in diversity (i.e., the number of species per sample) from 7 to 10 species per location. Individuals tended to be distributed evenly among species.

5.1.2.4 Lobster

Lobster (*Homarus americanus*) are an important commercial species that are found in the project area. The Maine annual catch of lobsters in 2016 was 131 million pounds, while approximately 122 million pounds were landed in 2015 (MEDMR, 2016). Portland Harbor and Casco Bay provide a significant fraction of the overall lobster landings in Maine. Cumberland County which includes Chebeague Island, caught 14,093,637 pounds of lobsters in 2016 (MEDMR, 2016).

Coastal lobsters are concentrated in rocky areas for shelter, but mud substrates suitable for burrowing can also have high densities of lobster. In summer months, adult lobsters migrate to inshore waters and then return to deeper water as the temperature decreases. Migrations also take place prior to storms. The distance lobsters travel is a function of their size, age, and location. Larger lobsters generally travel further than the small, inshore lobsters. Large lobsters can travel hundreds of miles in the summer (USFWS, 1993). Lobsters are omnivorous and are primarily a predator upon invertebrates such as crabs, polychaetes, clams, mussels, starfish, and sea urchins; lobsters are also a successful scavenger (Krouse, 1984). Larval lobsters in the upper water column feed on small animals and plants, including other larval lobsters (MEDMR, 1981). Once the larval lobsters descend to the bottom of the water column, they will readily attack and eat isopods and amphipods (MEDMR, 1981).

Lobster eggs hatch between May and October; the warmer the water, the earlier the hatch (Mackenzie and Moring, 1985). Stage I larvae are collected from June to early August off the coast of Maine (Mackenzie and Moring, 1985). The lobsters go through four free-swimming stages before settling to the bottom where they burrow into the substrate and molt into juveniles. Lobsters inshore appear to have a limited home range. Sixty-five percent of the lobsters tagged in the spring of 1975 and released from three locations in Maine were captured; and within two and one-half years, 75.9% of the lobsters had been recaptured (Krouse, 1981). Most returns (88%) occurred within a less than six-mile radius of the release site (Krouse, 1981).

Lobsters are harvested all around Chebeague Island and its surrounding waters. There are no off-limit harvesting areas from April to November (Genaro Balzano, Chebeague Harbormaster, Personal Communication, January 2018). However, this area is part of Maine Department of Marine Resources (MEDMR) Lobster Management Area 1 and lobster trawl maximums surrounding Chebeague Island are limited to less than four (4) per trawl (MEDMR, 2016).

5.1.2.5 Shellfish

Both soft shell clam and blue mussel shellfish resources exist around the stone wharf on Great Chebeague Island. Based upon MEDMR resource data (Figure EA 5-6), there are 0.6 acres of blue mussel and 0.2 acres of soft shell clam habitat within the proposed dredge footprint (including side slopes). However, benthic samples taken from the areas noted as habitat did not capture any individuals of either species.

Sea scallop beds exist in the surrounding waters of Casco Bay, but not within or directly adjacent to the proposed project area. The closest scallop beds are located approximately

2,200 feet northwest of the proposed dredge project (MEDMR, 2018). The closest scallop closure and rotational management area is located approximately three nautical miles (nm) south west on Long Island (MEDMR, 2018). There are nine (9) active Limited Purpose Aquaculture (LPA) licenses around Chebeague Island shores and three active aquaculture leases. Neither the LPA licenses nor the active leases are within or adjacent to the project area. The closest active LPA license is one (1) nm to the southwest and the closest active aquaculture lease is three and one half (3.5) nm to the southwest (MEDMR, 2018).

The Shellfish Warden oversees the harvesting of shellfish within the coastal waters of the Town of Chebeague Island. The Shellfish Warden issues clamming permits, both residential and commercial, enforces the rules and regulations set forth by the State of Maine Department of Marine Resources, and ensures that shellfish are harvested in a safe manner. There is a very small commercial shell fishing operation around the island. The Town of Chebeague issues five (5) commercial licenses, three (3) senior commercial licenses, and approximately 100 recreational licenses annually. The commercial license holders are limited to one bushel per tide and for only 90 days. The MEDMR does not consider Chebeague Island a significant commercial shellfish resource (Denis-Marc Nault, MEDMR, personal communication, January 2018).

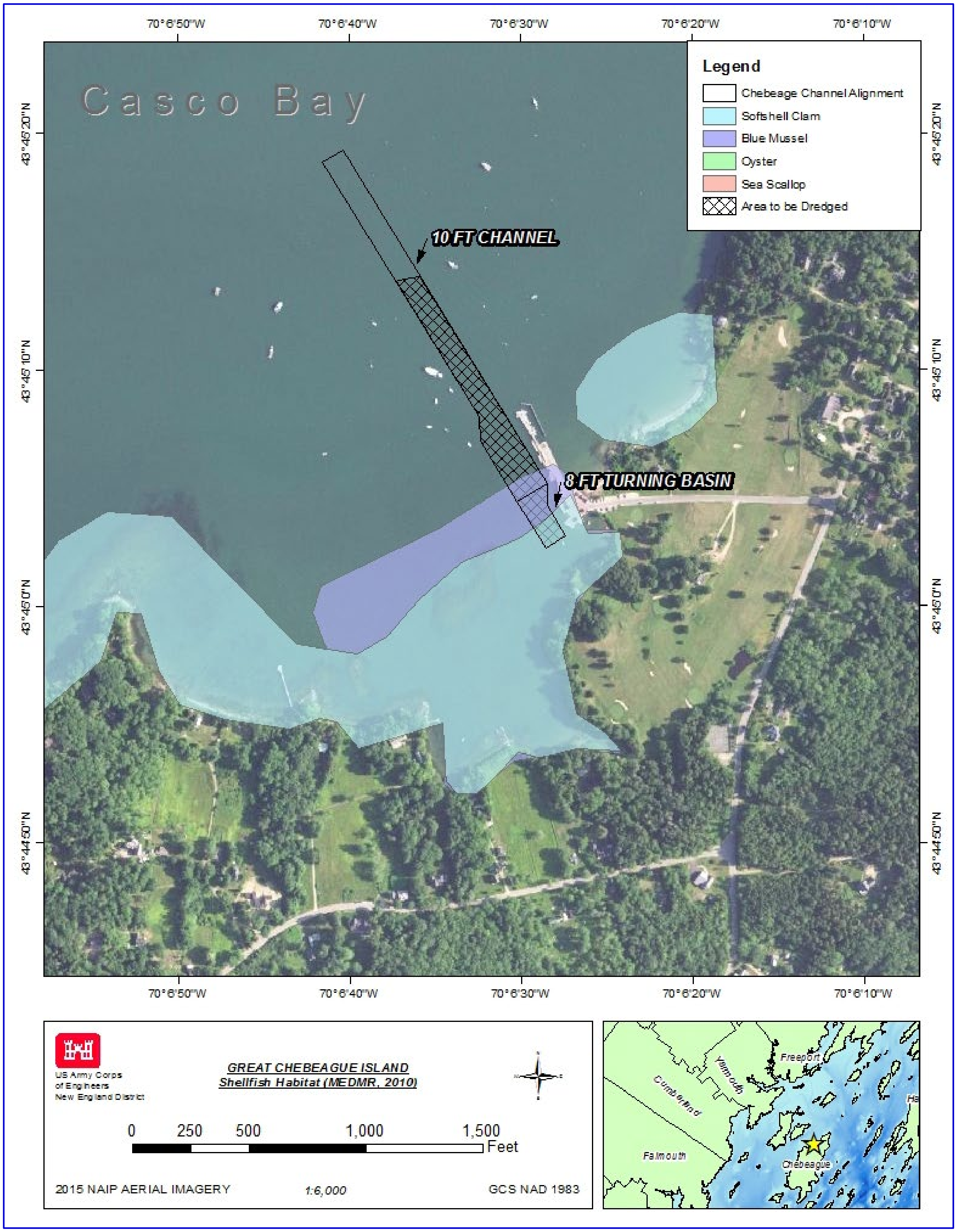


Figure EA-7. Shellfish Resources at the Great Chebeague Island Federal Navigation Improvement Project

5.1.2.6 Fish

Numerous marine and estuarine fish species use waters surrounding Chebeague Island and Casco Bay area as nursery, feeding, and resting areas. Thirty-six species of fish were documented to reside in Casco Bay, with winter flounder being the most common species found year-round (Casco Bay Estuary Project, 1996). The most important year-round fish in Casco Bay are bottom feeders such as pollock, sculpin, and skate. These fish feed on marine invertebrates such as small bottom-dwelling mollusks, marine worms, and amphipods. The shallow, protected coves in Casco Bay provide excellent spawning habitat for fish that deposit eggs on the bottom (e.g., sculpin, winter flounder, winter gunnel, tomcod, and skate) (U.S. Fish and Wildlife Service, 1980).

Atlantic herring, alewife, Atlantic menhaden, American sand lance, and Atlantic shad live in the water column and feed on microscopic plants and animals. Bluefin tuna, the hakes, spiny dogfish, Atlantic mackerel, and striped bass enter the bay in the summer; alewife, rainbow smelt, shad, and occasional salmon pass through Casco Bay on their way to spawn in rivers (Casco Bay Estuary Project, 1996). Eels live in the rivers of the watershed and travel through Casco Bay to spawn in the Sargasso Sea (Casco Bay Estuary Project, 1996).

Many of these fish species also utilize waters surrounding Great Chebeague Island, in particular the intertidal flats. Shallow water on the mud flat at high tide may provide a refuge from predators for juvenile flounder, mummichogs, tomcod, and summer residents such as juveniles of menhaden and herring (FHA/MEDOT, 1988). Juvenile bluefish and pollock often prey upon these species but may be restricted by water depth on the mud flat (FHA/MEDOT, 1988).

5.1.2.7 Wildlife

Coastal Maine is important for shorebirds as a feeding and resting area during migration. In addition, the piping plover and spotted sandpiper breed along the coast and the purple sandpiper is a winter resident. Shorebirds feed on invertebrates on intertidal mudflats and roost on sand, gravel beaches, spits, wetlands, or near shore ledges (Fefer and Schettig 1980). The habitat of northeastern Maine is generally characterized as excellent habitat for all migrating and wintering waterfowl species of Maine. The high quality of the Maine habitat is due in large part to the large tidal range, which exposes extensive mudflats in the harbor. This supplies excellent habitat for dabbler ducks, particularly black ducks (Fefer and Schettig 1980).

The USFWS IPaC system reported 54 migratory birds with the potential to occur in the project location (Table EA 5-6). The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in the project location. These species would be protected under either the Bald and Golden Eagle Protection Act of 1940 or the Migratory Birds Treaty Act of 1918. A majority of these species do not breed in the project area and/or are not likely be present in the project area during construction (October 1 – April 1).

Table EA 5-6. USFWS IPaC Migratory Bird Resource List for Proposed Project Area

Common Name	Scientific Name	IPaC Status
Arctic Tern	*Sterna paradisaea*	
Atlantic Puffin	*Fratercula arctica*	
Bald Eagle	*Haliaeetus leucocephalus*	
Black Guillemot	*Cepphus grylle*	Breeds elsewhere
Black Scoter	*Melanitta nigra*	Breeds elsewhere
Black-billed Cuckoo	*Coccyzus erythropthalmus*	BCC
Black-legged Kittiwake	*Rissa tridactyla*	Breeds elsewhere
Bobolink	*Dolichonyx oryzivorus*	BCC
Bonaparte's Gull	*Chroicocephalus philadelphia*	Breeds elsewhere
Cape May Warbler	*Setophaga tigrina*	BCC
Common Eider	*Somateria mollissima*	Breeds elsewhere
Common Loon	*Gavia immer*	Breeds elsewhere
Common Murre	*Uria aalge*	Breeds elsewhere
Common Tern	*Sterna hirundo*	Breeds elsewhere
Cory's Shearwater	*Calonectris diomedea*	Breeds elsewhere
Double-crested Cormorant	*Phalacrocorax auritus*	
Dovekie	*Alle alle*	Breeds elsewhere
Evening Grosbeak	*Coccothraustes vespertinus*	BCC
Golden Eagle	*Aquila chrysaetos*	
Great Black-backed Gull	*Larus marinus*	Breeds elsewhere
Great Shearwater	*Puffinus gravis*	Breeds elsewhere
Herring Gull	*Larus argentatus*	
Hudsonian Godwit	*Limosa haemastica*	Breeds elsewhere, BCC
Least Tern	*Sterna antillarum*	Breeds elsewhere
Lesser Yellowlegs	*Tringa favipes*	Breeds elsewhere, BCC
Long-eared Owl	*Asio otus*	BCC
Long-tailed Duck	*Clangula hyemalis*	Breeds elsewhere
Manx Shearwater	*Puffinus puffinus*	
Nelson's Sparrow	*Ammodramus nelsoni*	BCC
Northern Fulmar	*Fulmarus glacialis*	Breeds elsewhere
Northern Gannet	*Morus bassanus*	Breeds elsewhere
Olive-sided Flycatcher	*Contopus cooperi*	BCC
Parasitic Jaeger	*Stercorarius parasiticus*	Breeds elsewhere
Pomarine Jaeger	*Stercorarius pomarinus*	Breeds elsewhere
Prairie Warbler	*Dendroica discolor*	BCC
Purple Sandpiper	*Calidris maritima*	Breeds elsewhere, BCC
Razorbill	*Alca torda*	
Red Phalarope	*Phalaropus fulicarius*	Breeds elsewhere
Red-breasted Merganser	*Mergus serrator*	Breeds elsewhere
Red-necked Phalarope	*Phalaropus lobatus*	Breeds elsewhere
Red-throated Loon	*Gavia stellata*	Breeds elsewhere, BCC
Ring-billed Gull	*Larus delawarensis*	Breeds elsewhere

Common Name	Scientific Name	IPaC Status
Roseate Tern	*Sterna dougallii*	
Royal Tern	*Thalasseus maximus*	
Rusty Blackbird	*Euphagus carolinus*	
Semipalmated Sandpiper	*Calidris pusilla*	Breeds elsewhere, BCC
Surf Scoter	*Melanitta perspicillata*	
Thick-billed Murre	*Uria lomvia*	
Whimbrel	*Numenius phaeopus*	
White-winged Scoter	*Melanitta fusca*	Breeds elsewhere
Willet	*Tringa semipalmata*	
Wilson's Storm-petrel	*Oceanites oceanicus*	Breeds elsewhere
Wood Thrush	*Hylocichla mustelina*	BCC
Yellow Rail	*Coturnicops noveboracensis*	BCC

5.1.3 Threatened and Endangered Species

According to USFWS IPaC resource tool, the only protected species under the jurisdiction of the USFWS with potential to occur in this general area is the federally threatened and state endangered northern long-eared bat (NLEB) (*Myotis septentrionalis*). This project will take place entirely within subtidal areas and adjacent to forested uplands. Therefore, USACE has made the determination the proposed project may affect, but is not likely to adversely affect, this species.

Transient adult and juvenile Atlantic sturgeon (*Acipenser oxyrhynchus oxyrinchus*) belonging to the Gulf of Maine Distinct Population Segment (DPS), which are considered federally threatened, have the potential to occur in Casco Bay and therefore in the waters surrounding Great Chebeague Island. Transient adult short-nose sturgeon (*Acipenser brevirostrum),* which are considered federally endangered, also have the potential to occur in Casco Bay and in the waters surrounding Great Chebeague Island. Adult and juvenile Atlantic salmon (*Salmo salar*) may also be found in the waters of Casco Bay as a transient species.

Four species of federally threatened or endangered sea turtles may be found seasonally in the coastal waters of Maine: the federally threatened Northwest Atlantic Ocean DPS of loggerhead turtle (*Caretta caretta*); the federally endangered Kemp's Ridley (*Lepidochelys kempi*); the green turtle (*Chelonia mydas*); and the leatherback (*Dermochelys coriacea*) sea turtle. The leatherback is generally found in deep offshore waters and as such, is unlikely to occur in the action area. 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 can be expected in the waters of Casco Bay in warmer months. This typically coincides with the months of May through November, with the highest concentration of sea turtles present from June to October (Morreale and Standora 1998).

5.1.4 Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act and amended by the Sustainable Fisheries Act of 1996, an Essential Fish Habitat (EFH) consultation is necessary for this project. EFH is broadly defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The proposed Great Chebeague Island federal navigation improvement project falls into this category and thus has the potential to provide habitat for fish species in the area.

The National Marine Fisheries Service (NFMS) Final Omnibus Essential Fish Habitat Assessment Amendment 2 along with GIS data of EFH designations from NMFS, were used to determine which species have designated EFH in the project area and surrounding areas. These species are presented in Table EA 5-7.

Table EA 5-7. List of Species that have Designated EFH in the Waters Surrounding Great Chebeague Island (NMFS 2017).

Species	Eggs	Larvae	Juveniles	Adults
American plaice (*Hippogloissoides platessoides)*	X	X	X	X
Atlantic Cod (*Gadus morhua*)	X	X	X	X
Ocean pout (*Macrozoarces americanus*)	X		X	X
Pollock (*Pollachius virens*)			X	
White Hake (*Urophycis tenuis*)			X	X
Windowpane flounder (*Scophtalmus aquosus*)	X	X	X	X
Winter flounder (*Pseudopleuronectes americanus*)	X	X	X	X
Silver Hake (*Merluccius bilinearis)*	X	X		X
Red Hake (*Urophycis chuss*)	X	X	X	X
Smooth skate (*Malacoraja senta)*			X	
Thorny Skate (*Amblyraja radiata)*		X		
Little Skate (*Leucoraja erinacea*)			X	X
Winter Skate (*Leucoraja ocellata*)			X	
Atlantic sea scallop (*Placopecten magellanicus*)	X	X	X	X
Atlantic Herring (*Clupea harengus)*		X	X	X
Atlantic mackerel (*Scomber scombrus*)			X	X
Atlantic Butterfish *(Peprilus triacanthus)*			X	X
Atlantic Wolfish (*Anarhichas lupus*)	X	X	X	X
Haddock (*Melanogrammus aeglefinus*)			X	
Acadian Redfish (*Sebastes fasciatus*)		X		
Yellowtail Flounder (*Pleuronectes ferruginea)*	X	X	X	X
Monkfish (*Lophius americanus*)			X	X
Bluefin Tuna (*Thunnus thynnus*)				X

5.1.5 Air Quality & Noise

Air Quality

Ambient air quality is protected by Federal and state regulations. The U.S. EPA has developed National Ambient Air Quality Standards (NAAQS) for certain air pollutants, and air quality standards for each state cannot be less stringent than the NAAQS. The NAAQS determined by the EPA set the concentration limits that determine the attainment status for each criteria pollutant. The EPA has identified seven specific pollutants (called criteria pollutants) that are of concern with respect to the health and welfare of the general public. The criteria pollutants are carbon monoxide (CO), sulfur dioxide (SO2), nitrogen dioxide (NO2), ozone (O3), particulate matter 10 micrometers or less in aerodynamic diameter (PM10), particulate matter 2.5 micrometers or less in aerodynamic diameter (PM2.5), and lead (Pb). The entire state of Maine is currently designated as in attainment for the air pollutants listed above.

Noise

The proposed project location on Great Chebeague Island is an active port. The noise environment in the project area consists routinely of noise from motoring ferries, fishing, and recreational vessels, noise from construction, maintenance, and loading/unloading efforts on the docks and piers immediately adjacent to the area. Typical noise associated with the marine environment (i.e., wildlife, water movement, and air movement) is also present.

5.1.6 Historic and Archaeological Resources

The Town of Chebeague Island is a municipality consisting of 17 islands in upper Casco Bay, Cumberland County, Maine, about 10 miles north of Portland. Two of the Town's islands are inhabited, of which Great Chebeague Island is the largest and the center of town commerce and population. The island's principal landing is at the Stone Wharf on the northwest shore facing the mainland and is the location of its ferry terminal and principal commercial anchorage.

A review of the National Oceanic and Atmospheric Administration's Automated Wreck and Obstruction Information System and Electronic Navigational Charts database did not identify any shipwrecks within the area of potential effect. Several potential wrecks were noted on the eastern and western sides of the island outside of the project area limits. Two wrecks from 1880 and 1870 are reportedly listed in your office's data inventory for Chebeague; however, we have been unable to confirm their locations at this time.

The Town of Chebeague Island prepared a comprehensive plan in 2011 that included historic and archaeological resources and referenced the two wrecks above. Additionally, areas considered sensitive for Native American shell midden sites were noted in various areas along the shoreline. Many of these sites have eroded or been so badly damaged that they are no longer considered significant. None of the archaeologically-sensitive areas are located within the proposed channel's limits.

5.1.7 Socioeconomic Environment

Great Chebeague Island was settled in the 1730s and became the newest town in Maine in 2007. Prior to its independence, Chebeague was a part of the Town of Cumberland. Chebeague became part of Cumberland in 1820 when North Yarmouth was divided into smaller towns. Chebeague Islanders had the choice of affiliating themselves with either of the two new towns of Yarmouth or Cumberland. They chose Cumberland because, at that time, the closest landfall was Cumberland Foreside, with much easier access than to Yarmouth Village, up the often icy Royal River.

Chebeague is one of fourteen remaining year-round island communities in the State of Maine. It has its own school for pre-school through 5th grade. Grades 6 through 12 attend school in the Town of Yarmouth.

The Town of Chebeague has five elected selectmen who conduct the town's business with the assistance of a Town Administrator. Town meetings are held annually in June. The town boasts its own volunteer fire and rescue squads, public safety building, town garage, solid waste transfer station and recycling center, health care center, assisted living facility, church, cemetery, post office, day care center, recreation center, library, boatyard, restaurants, Grange Hall, community hall, hotel, stores, community organizations, and, of course, public beaches.

Approximately 350 people live on Chebeague year-round, while the summer population swells to about 2,000. Fishing is the major industry on Chebeague. Non-fishing families support themselves by providing the goods and services needed by both the year-round and the summer communities. Between 25 and 50 people (depending on the season) commute to various mainland occupations (Town of Chebeague, 2018).

5.2 Disposal Site

5.2.1 Sediment and Water Quality

The Final Environmental Impact Statement for the designation of the Portland, Maine Dredged Material Disposal Site was released in 1983. The U.S. Environmental Protection Agency approved the existing Portland Disposal Site for interim use in 1979, under authority granted in the Marine Protection, Research, and Sanctuaries Act of 1972, based on historical use of the disposal site. The Portland Disposal Site has an area of one square nautical mile, the center is located 7.1 nautical miles (13.16 km) east of Dyer Point, Cape Elizabeth, Maine (Figure 2) and encompasses a 0.997 square nautical mile (3.42 km^2) area centered at 43° 34.105´ N, 70° 01.969´ W (NAD 83). The seafloor topography at PDS is rocky and irregular, with water depths that range from 138 to 243 feet (42-74 m). Surveys indicate that the disposal site is in a depression. The topography is extremely rugged with bedrock outcrops surrounded by fine sand and mud (NUSC, 1979). The regulated and monitored placement of dredged material has been occurring at this site since 1977. However, documented use of this area for dredged material placement dates back to 1946, when material was disposed over a 5.2 square nautical mile (17.7 km^2) irregularly shaped area of seafloor surrounding the current PDS boundaries. A total of approximately 2.5 million cubic yards of material has been disposed of at PDS since it was designated by EPA as a dredged material disposal site in 1982 (USACE, in prep). According to DAMOS Contribution 203 (Battelle, 2020), five distinct disposal locations within PDS boundary have been targeted since its inception.

Physical oceanographic parameters determine the nature and extent of the mixing zone, thereby influencing sediment transport and the chemical environment at the Portland Disposal Site. Strong temperature or salinity gradients inhibit mixing of surface and bottom waters, whereas waves aid mixing, resuspend bottom sediments, and affect the turbidity of the water. Currents, especially bottom currents, determine the direction and influence the extent of sediment transport (EPA, 1983). Tidal currents may contribute to the transport of dredged material to the bottom of the ocean, but usually do not add to the net directional effects (EPA, 1983).

General circulation in the Gulf of Maine is counterclockwise, while a clockwise gyre occurs over Georges Bank to the southeast. Currents at the disposal site are primarily rotary, with the dominant directions to be north-northeast and south-southwest (NUSC, 1979). Current meter data collected at the site show that the horizontal kinetic energy of the Portland Disposal Site is one of the lowest of all the disposal sites in New England. When this energy is broken down into tidal and residual components, the random motion is greater than that due to tidal forces (NUSC, 1979). Although the lower percentage of tidal flow would reduce the potential for prediction of currents, the lower absolute value of the currents is well below any threshold values for erosion of sediment (NUSC, 1979). The 10% highest speed measured during this sampling period was 5.35 inch/sec (13.6 cm/sec), also below the threshold erosion velocities (NUSC, 1979).

Vertical profiles of temperature, salinity, and density were collected from the Portland Disposal Site during the months of February, April, and May of 1996 (McDowell and Pace, 1998). The February profile revealed a very-weakly-stratified water column, typical of coastal Gulf of Maine in the winter. During late April and mid-May, relatively fresh and warm water was introduced to the surface layer, presumably as a result of river discharge. Beneath a moderate thermocline and pycnocline, water properties were nearly constant throughout the lower half of the water column during late spring. With regard to the vertical density stratification, it is apparent that the entire water column to a depth of 60 meters is very weakly stratified throughout winter and early spring, whereas the introduction of fresh and warm water at the surface during mid-spring causes considerable stratification that may tend to decouple horizontal currents and other transport processes within a two-layer water column.

Moored instrumentation at the bottom of the Portland Disposal Site also yielded information about near-bottom currents, water temperature, pressure, and relative turbidity over the period from late February to mid-May 1996 (McDowell and Pace, 1998). Hourly averaged near-bottom current speeds during the measurements period ranged from 0 to approximately 0.4 knots (approximately 20 cm/s), with the majority of the variability occurring at period of approximately 12 hours in association with the semi-diurnal tide. Tidal harmonic analysis of the current velocity data showed that the amplitude of the M_2 semi-diurnal tidal current is weak (approximately three cm/s), but significantly stronger than all other tidal constituents. This is consistent with the above report (NUSC, 1979) of weak (3-7 cm/s) tidal currents 4.9 feet (1.5 meters) above the bottom at the disposal site.

Time series measurements of near-bottom turbidity during the 78-day measurement period were taken at 13 and 32 inches (33 and 81 cm) above the seafloor (McDowell and Pace, 1998). Low background levels of turbidity were observed, with the majority of the measurements below 5 mg/l. This suggests that little, if any, of the dredged material is moved from the disposal site. However, field measurements taken during particular storms show elevated sediment resuspension, where suspended particulate concentrations of 65 and 40 mg/l were recorded. The measurements did show times when a correlation between maximum suspended particulate concentration and significant wave height was not apparent. Other factors such as wave period, duration of maximum wave height, and other factors play a major role in the near-bottom energy affecting sediment resuspension (McDowell and Pace, 1998). The availability of fine-grained sediment also plays a role in the suspended particulate concentrations in the near-bottom column (McDowell and Pace, 1998).

5.2.2 Biological Environment

The Portland Disposal Site is composed of an area with rugged, rocky outcrops interspersed with a few local sedimentary basins. The communities on bottoms composed of fine-grained, soft sediment near the disposal site tend to be dominated by polychaetes and mollusks (NUSC, 1979; Battelle, 2020). Basin slopes and sediment pockets among rocky outcrops often contain organisms attached directly to rock as well as buried within the sediment. These communities are somewhat less diverse and contain fewer numbers of polychaetes than the fine sediment communities (EPA, 1983). Infaunal communities are dominated by the polychaetes *Ampharete artica, Anobothrus gracilis, Arcidea quadrilobata, Paraonis gracilis, Prionospio malmgreni*; mollusks and crustaceans are relatively unimportant (EPA, 1983). The epifaunal community associated with the rocky outcrops is dominated by attached suspension feeders. The most abundant species observed on the rocky areas are the brachiopod *Terebratulina septentrionalis* and the solitary sponge *Polymastia infrapilosa* (EPA, 1983). Barnacles *Balanus balanus* and several species of encrusting and erect sponges were common on rock surfaces with little or no sediment, as were tunicates *Ascidia callosa* and unidentified clumps of bryozoans and/or hydroids (EPA, 1983). Lobsters may use the site for cover and feeding due to the number of rocky outcrops in the disposal site.

It would be expected that most of the common Gulf of Maine fish are present to some degree within the Portland Disposal Site. Most of the fish (77%) are demersal, feeding predominantly on bottom organisms such as polychaetes, mollusks, and small crustaceans (EPA, 1983). Some fish species migrate seasonally. Fishes moving north into the Gulf of Maine and beyond during the summer and returning south in the fall include: spiny dogfish *Squalus acanthias*, silver hake *Merluccius bilinearis*, red hake *Urophycis chuss*, white hake *U. tenuis*, American shad *Alosa sapidissima*, striped bass *Morone saxatilis*, butterfish *Poronotus triacanthus*, and Atlantic menhaden *Brevoortia tyrannus* (EPA, 1983). A few species, such as the Atlantic herring *Clupea harengus* and Atlantic cod *Gadus morhua*, migrate south from the Gulf of Maine before winter (EPA, 1983). Other species display seasonal onshore-offshore movements within the Gulf of Maine. Fish species collected within the disposal site include Atlantic cod *Gadus morhua*, American plaice *Hippoglossoides platessoides*, goosefish *Lophius americanus*, and yellowtail flounder *Limanda ferruginea* (EPA, 1983).

The latest DAMOS monitoring events at the Portland Disposal Site occurred in 2007 and 2016 (AECOM, 2009 and USACE, in prep, respectively). In 2007, sediment-profile and plan view underwater camera imaging (SPI and PV) occurred at the three disposal mounds (PDA A, PDA 95, PDA 98). The older mounds (PDA 95 and PDA 98) were recolonized by a mature equilibrium, deposit feeding community (Stage III communities) and had subsurface sediments extensively bioturbated that were ecologically equivalent to those in the reference areas (AECOM, 2009). Mound PDA A used in 2007 displayed the classic pattern of early recolonization with little to no evidence of deep burrowing or bioturbational activity and successional stages were confined to initial opportunistic assemblages (Stage I) or shallow-dwelling deposit feeders (Stage II) (AECOM, 2009). In 2016, SPI and PV work occurred at three mounds (PDA 95, PDA A, PDS Inactive) and two reference areas (SREF and EREF). The benthic communities at the two disposal sites located within the deep trough area of PDS (PDA 95 and PDS Inactive) were recovering as noted above for the 2007 effort, with full recovery expected within one year of completion of dredged material placement.

5.2.3 Threatened and Endangered Species

Fish

Transient adult and juvenile Atlantic sturgeon (*Acipenser oxyrhynchus oxyrinchus*) belonging to the Gulf of Maine DPS, which are considered federally threatened, have the potential to occur in Casco Bay and therefore along the haul route to PDS and in PDS. Transient adult short-nose sturgeon (*Acipenser brevirostrum),* which are considered federally endangered, also have the potential to occur in Casco Bay and therefore in the waters affected by the proposed project. Adult and juvenile Atlantic salmon (*Salmo salar*) may also be found in the waters of Casco Bay as a transient species.

Reptiles

Four species of federally threatened or endangered sea turtles may be found seasonally in the coastal waters of Maine: the federally threatened Northwest Atlantic Ocean DPS of loggerhead turtle (*Caretta caretta*); the federally endangered Kemp's Ridley (*Lepidochelys kempi*); the green turtle (*Chelonia mydas*); and the leatherback (*Dermochelys coriacea*) sea turtle. 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 can be expected in the waters of Casco Bay in warmer months. This typically coincides with the months of May through November, with the highest concentration of sea turtles present from June to October (Morreale and Standora 1998).

Marine Mammals

Marine mammals such as whales, porpoises, and seals may travel through the placement site, adjacent waters, and along the proposed haul route to the PDS. The NMFS ESA mapping tool identified the following listed marine mammal species as having the potential to occur in the project area: the North Atlantic right whale (*Eubaleana glacialis*) and the fin whale (*Balaenoptera physalus*). North Atlantic right whale use the area for foraging and overwintering. Additionally, the project area is within North Atlantic right whale Critical Habitat Unit 1 (feeding area). The fin whale uses the area for foraging and overwintering.

5.2.4 Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act and amended by the Sustainable Fisheries Act of 1996, an Essential Fish Habitat (EFH) consultation is necessary for this project. EFH is broadly defined as "those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity." The Portland Disposal Site falls into this category and thus has the potential to provide habitat for fish species in the area. The EFH species within the PDS are the same as those noted above in Section 6.2.4.

5.2.5 Air Quality and Noise

Air Quality

See text above in Section 5.1.5.

Noise

The Portland Disposal Site is in open ocean waters. The noise environment in the project area can consist of noise from fishing and recreational vessels. However, the predominant noise at the site is associated with the marine environment (i.e., wildlife, water movement, and air movement).

5.2.6 Historic and Archaeological Resources

The Portland Disposal Site is a previously authorized and utilized ocean disposal site for placement dredged material. Due to its continued use as far back as 1946, historic properties, if present, are either previously disturbed or not expected at this location.

6.0 Environmental Consequences

6.1 No Action Alternative

6.1.1 Physical and Chemical

The No Action Alternative should not have any effects on the physical and chemical environment of the proposed project area or disposal area. However, the use of the existing undersized channel and turning area by the island's ferry could result in potential groundings and fuel spills if no action is performed.

6.1.2 Biological Environment

The No Action Alternative would not have any effects on the biological resources of the proposed project area or disposal area.

6.1.3 Threatened and Endangered Species

The No Action Alternative will have no effects on the threatened or endangered species in the project area or disposal area.

6.1.4 Essential Fish Habitat

The No Action Alternative will have no effects on the current essential fish habitat within the project area or disposal area.

6.1.5 Air Quality and Noise

The No Action Alternative would not have any significant effects on air quality or the noise environment of the project area or disposal area.

6.1.6 Historic and Archaeological Resources

The No Action Alternative will have no effects on any historic or archaeological resources within the project area or disposal area.

6.1.7 Socioeconomic Environment

The No Action Alternative could have negative effects on the socioeconomic environment of Great Chebeague Island. The island is only accessible by boat or ferry as there are no bridges to the island. The lack of adequate navigation access to the island could negatively impact residents' ability to travel to and from the island and receive goods and services from the mainland. Access to the island could become impaired and/or unsafe if the proposed project is not constructed and would therefore negatively affect the socioeconomic environment of the island's community.

6.2 Effects of Proposed Action at Dredge Site

6.2.1 Sediment and Water Quality

Dredging of material from the proposed project is anticipated to have an impact on the physical environment of the project area. The suspension of silt and sand in the water column as the material is removed is the source of the impact. Based upon previous studies concerning dredged material removal (discussed below), the impacts are expected to be short-term (only occurring during the active dredging process) and localized (occurring within short distances of the dredging).

The amount of sediments suspended during dredging are generally highest very near the dredging operation and return to the levels of the surrounding water within a short distance from the dredging site. Temporary increases in turbidity during the proposed dredge effort would occur in the immediate vicinity of the active dredging site during construction. During periods of non-dredging (e.g., during shift changes, dredge-plant repositioning, dredge repair, etc.) turbidity levels would fall and potentially reach background levels within short periods of time. In addition, the location of the plume with respect to the dredge shifts with the tides so that areas the effect on specific areas of the bottom are intermittent. It is anticipated that elevated turbidity levels will return to background conditions upon completion of the dredging operation.

The primary type of dredge considered for use in the Great Chebeague Island dredging is a mechanical dredge with a clamshell bucket. Based on historical studies it has been found that approximately 1.5% to 3.0% of the sediment volume is re-introduced to the water column with a bucket dredge (Bohlen, *et al.*, 1979; Palermo, 1991). For clamshell bucket dredges, sediment resuspension comes from four major sources: sediment suspended by the impact and withdrawal of the bucket from the bottom; washing of material from the top and sides of the bucket as it moves through the water column; spillage of sediment-laden water out of the bucket as it breaks the water surface; inadvertent spillage of material during barge loading or intentional overflow intended to increase a barge's effective load (Hayes, 1986; LaSalle, 1988).

An open bucket could resuspend solids concentration of 150-900 mg/l within 100 feet, 100-600 mg/l within 200 feet and 75-350 mg/l within 400 feet downstream of the dredge (Hayes, 1986; Palermo, 1991). Many studies (Bohlen *et al*. 1979; Palermo, 1991; Bohlen, *et al*., 1996) have found that during dredge operations with a large volume bucket dredge, material concentrations within the dredge induced plumes tend to decrease rapidly and approach background within approximately 2,000 feet.

The results of suspended sediment monitoring programs for dredging efforts in New Haven Harbor, Boston Harbor, and Providence River can be used to predict the behavior of suspended sediment plumes associated with bucket dredging. These programs were established to gather information concerning the transport and fate of suspended sediments resulting from the dredging operations.

The results from the New Haven Harbor study (Bohlen, *et al*., 1996) showed that the silty sediment suspended by the dredge did, at times, migrate outside of the navigation channel onto adjacent shoal areas. Excursions onto the shoals only occurred when the dredge was in the immediate vicinity and during maximum tidal currents. The plume was more likely to stay within the confines of the channel during early or late ebb tides. This is supported by data which showed that suspended sediment concentrations dropped fairly quickly away from the dredging activity. The highest concentration of suspended sediment measured (662 mg/l) was located within 100 meters (328 ft) of the barge and associated with the near bottom waters. Most of the higher concentration data were within a 100-meter range of the barge, regardless of the tide state. Beyond that distance, most of the data indicates that the concentrations with the dredge-induced plume were relatively low, decreasing rapidly under the combined effects of settling, advective and turbulent diffusion, and mixing.

Monitoring during the Boston Harbor Navigation Improvement Project (BHNIP) was conducted in conjunction with the dredging of silty materials during the construction of a confined aquatic disposal (CAD) cell. This monitoring included: 1) documentation of the spatial and temporal distribution of the sediment plume for the four extremes of tidal currents (high water slack, maximum ebb, low water slack, maximum flood) on two days within the first week of dredging; 2) collection of water samples from the lower half of the water column at two locations – 1,000 feet up current of the dredging and 500 feet down current from the dredging; and 3) analysis of water samples for TSS. Additional parameters (turbidity, DO, arsenic, and copper) were analyzed when dredging the parent material. During dredging, turbidity measurements ranged from 3-5 NTU (Nephelometric Turbidity Units) at the reference station 1,000 feet up current from dredging the silty surface material using an environmental bucket dredge, which is a closed clamshell bucket that is sealed with rubber gaskets. Turbidity was only slightly elevated at the station 500 feet down current of the dredging ranging from 4-11 NTU. TSS ranged from 4-5 mg/L at the reference station and from 5-9 mg/L at the down current station. No plume was visible at the surface outside the immediate area of the dredging operation, and no significant plume was detected in the water column (ENSR, 1997). Additional plume monitoring performed during the Boston Harbor Inner Harbor Maintenance Dredging Project (IHMDP) confirmed the monitoring results of the BHNIP monitoring. Except for an area with variable currents where several bodies of water meet, all the dredged and disposal plumes stayed confined to the navigation channel (USACE, 2009).

Monitoring of the Providence River and Harbor maintenance dredging project included surveys to characterize the spatial extent and suspended sediment concentrations of plumes generated by maintenance dredging, Confined Aquatic Disposal (CAD) cell construction, disposal into CAD cells, and disposal at Rhode Island Sound Disposal Site. All suspended solids plumes studied were found to be near-field and short-lived phenomena, concentrated near the bottom of water column for the higher suspended solids component of the plumes. Lower concentrations of suspended solids were generally detected for up to several hours and up to 3,000 feet down-current of the source, at which point suspended solids concentrations returned to ambient or near-ambient conditions (ENSR, 2008).

Based on the monitoring results presented above, sediment resuspension in the proposed project in the waters of Great Chebeague Island is anticipated to be mostly confined to the channel itself and the effects from those sediments limited to small areas of high turbidities for short durations. Little to no impacts are anticipated to the nearby shallow regions of the project area. Additionally, no significant release of contaminants is expected during the maintenance dredging operations as the material is low in contaminant concentrations.

The dredge area (including side slopes) in the proposed -10-foot-deep channel covers approximately 126,600 square feet (2.97 acres) of subtidal bottom. Following dredging, the subtidal areas will remain subtidal, but will be deeper than current depths.

The dredge area (including side slopes) in the proposed -8-foot-deep turning basin covers 14,760 square feet (0.33 acres) of subtidal bottom and approximately 26,830 square feet (0.61 acres) of intertidal bottom. After construction, the subtidal areas will remain subtidal but will be at deeper depths. The intertidal areas dredged will be permanently altered to subtidal habitat. Mitigation is proposed for the permanent conversion of 26,830 square feet of intertidal bottom to subtidal bottom. Appendix I details the mitigation plans.

6.2.2 Biological Environment

6.2.2.1 Wetlands and Shoreline Habitats

The dredging of Chebeague Island navigational channel and turning basin will not affect any vegetated wetland areas in the ecosystem. Improvement dredging is confined to the subtidal and intertidal environments and will not affect salt marsh resources adjacent to the project. As noted above, 3.3 acres of subtidal bottom and 0.61 acres of intertidal bottom will be impacted by the proposed project and mitigation for the loss of intertidal bottom is being proposed (Appendix I).

6.2.2.2 Eelgrass

Eelgrass beds were identified within the project area during a 2017 USACE eelgrass survey (Appendix G). The dredging of the channel and associated side slopes will permanently impact approximately 40,490 square feet (0.93 acres) of eelgrass and the dredging of the turning basin and associated side slopes will impact approximately 6,700 square feet (0.15 acres) of eelgrass (see Figure EA5-2).

Mitigation is being proposed for the permanent loss of eelgrass in the channel and turning basin (47,190 square feet (1.08 acres)) as well as for the temporal loss of eelgrass functions during the time needed to establish the mitigation site (2,830 square feet (0.06 acres)). Mitigation calculations are discussed in detail in Appendix I of this Environmental Assessment.

6.2.2.3 Benthic Community

Dredging operations will have adverse impacts on benthic resources in the channel and turning basin. Dredging would destroy the existing benthic invertebrate community in the dredged areas. Most sedentary organisms associated with the bottom sediments would be destroyed. Most motile organisms, such as crabs and finfish, are anticipated to be able to avoid the dredge. Recolonization of the dredged areas should commence immediately after construction. Benthic assemblages (in terms of species diversity and abundance) have been shown to return to communities resembling the pre-dredge community within 2 to 3 years after dredging (Newell, et al. 2004). Impacts to benthic resources from suspended sediments and elevated turbidity levels should be minimal as the impact will be short-term and localized to areas in the vicinity of the dredge plant.

6.2.2.4 Lobster

The proposed project should not have significant impacts to lobster resources in the dredging area. The main impact to these resources from this project will be increases in turbidity. Adult lobsters are tolerant of exposure to elevated suspended sediment concentrations (Stern and Stickle 1978), and therefore should not be significantly impacted by the project.

6.2.2.5 Shellfish

Dredging of the channel and turning basin will remove all shellfish in the direct footprint of the dredge. However, shellfish resources from adjacent areas should not be significantly impacted and will serve as a recruitment source following the cessation of dredging. Impacts from elevated turbidity to shellfish resources in the vicinity of the dredging operation should be minimal as the impact area will be highly localized. Several studies have demonstrated that shellfish are capable of withstanding elevated turbidity levels for short time periods (i.e., days) with no significant metabolic consequences or mortality (Wilber and Clarke 2001; Archambault et al., 2004; Norkko et al. 2006). Since the dredging of the project areas will be a short-term effort and reestablishment of shellfish populations in the dredge footprint will recover, impacts to shellfish resources are anticipated to be minimal.

6.2.2.6 Fish

The proposed project should not have significant impacts to the fish communities in the dredging area. Only a small area in the vicinity of the dredging site is likely to be impacted by elevated concentrations of suspended sediments or sedimentation. Most fish and shellfish are quite tolerant of short-term exposure to elevated suspended sediment levels and those in the vicinity of dredging activity are unlikely to be significantly impacted by this project (Stern and Skickle 1978). Some bottom fish may be entrained by the mechanical dredge. However, most motile fish can leave the area of disturbance during the construction period. Passage of finfish in this location is not expected to be impeded by construction activities. Removal of the shoal areas in the navigation channel and turning basin will temporarily decrease the amount of benthic resources available for food. However, areas adjacent to the navigation channel and Casco Bay can serve as a food source while the impacted area recolonizes.

6.2.2.7 Wildlife

Although the Chebeague Island shores are utilized by an abundance of avian species, there will be minimal impacts associated with the dredge project. Most migratory birds will not be present in the area during the dredge window (October 1 – April 1). Any remaining wildlife would experience a temporary displacement during dredge operations.

6.2.3 Threatened and Endangered Species

USACE NAE has made the determination that the proposed project will not affect threatened or endangered species in the dredging area, as none are anticipated to be present. While transient species such as Atlantic Sturgeon and sea turtles have the potential to be present in Casco Bay, their occurrences are unlikely, so USACE's determination for the disposal site and the associated haul route to the disposal site is that the project may affect, but not likely to adversely affect any threatened or endangered species. Coordination with the U.S. Fish and

Wildlife Service and the National Marine Fisheries Service is currently ongoing to determine if there are any identified threatened or endangered species in the project area (Appendix A).

6.2.4 Essential Fish Habitat

The proposed project would impact EFH for managed species. The habitats affected include shallow subtidal soft bottom habitat, intertidal sand flat, eelgrass habitat, and water column habitat. Effects of the proposed project include death and injury of fishes and forage during dredging operations and subsequent maintenance dredging operations. Direct removal of soft bottom habitats will occur in the dredging areas and direct covering of soft bottom habitats will occur in the placement areas. Indirect impacts due to changes in water quality will occur, however, they are anticipated to be short-term and localized to within hundreds of feet of the dredging and disposal efforts. These effects have been documented throughout Section 6.2. The list below summarizes potential effects of the proposed project on EFH and managed species. Details on the effects to specific groups of managed species associated with certain essential fish habitats can be found in Appendix J. The types of impacts to EFH and the species using the habitat are summarized in items 1 through 7 that follow.

1. Indirectly affecting foraging and refuge habitats by removal of benthic habitat (i.e., soft bottom) (an effect temporary in duration).

2. The permanent loss of 47,190 square feet (1.08 acres) of eelgrass habitat within the subtidal habitat noted above.

3. The conversion of 26,830 square feet (0.61 acres) of intertidal habitat to subtidal habitat.

4. Directly affecting mortality or injury of individual fishes (adults, subadults, juveniles, larvae, and/or eggs, depending on species, time of year, location, etc.) due to dredge equipment during construction dredging (an effect temporary in duration).

5. Indirectly affecting foraging behavior of individuals through production of turbidity at dredging and disposal sites (an effect temporary in duration).

6. Indirectly affecting movements of individuals around/away from dredging sites due to construction equipment and related disturbed benthic habitats (an effect temporary in duration).

Many of the dredging related impacts (i.e., increases in turbidity, changes in fish movement behavior) are common temporary occurrences in estuarine systems. Therefore, these temporary impacts normally occur under existing conditions (i.e., in the No Action alternative). However, the proposed project involves a longer duration of these temporary impacts. Individually or in sum, the above are not anticipated to significantly adversely affect managed species or most species EFHs. Where possible, the above effects have been minimized via project design. An EFH Assessment has been prepared for this project and is presented in Appendix J. The loss of 47,190 square feet of eelgrass habitat and 26,830 square feet (0.61 acres) of intertidal habitat will be a permanent loss. Mitigation for this loss is being proposed and is detailed in Appendix I.

6.2.5 Air Quality and Noise

Air Quality

The improvement dredging of Great Chebeague Island is subject to Clean Air Act requirements. However, since the project is located in an attainment area (Cumberland County) this project is not subject to the general conformity rule and an air quality conformity analysis is not needed.

The project should have no long-term impacts on air quality. While construction equipment is operating on the site it would emit pollutants, including nitrogen oxides that can lead to the formation of ozone. In order to minimize air quality effects during construction, construction activities would comply with applicable provisions of the Maine Air Quality Control Regulations pertaining to dust, odors, construction, noise, and motor vehicle emissions.

Noise

Minor increases in noise are expected as dredging operations will utilize dredges, scows, and support vessels. Noise sources will be from the engines, generators, and other machinery associated with the aforementioned equipment. An increase in noise in the project area will be temporary and noise levels will return to pre-construction levels following construction of the project.

6.2.6 Historic and Archaeological Resources

In 2017, USACE conducted a video and hydroacoustic survey to characterize submerged aquatic vegetation in the vicinity of the proposed dredge area. A total of 43 survey transects at intervals of 50 feet were laid out perpendicular to the proposed channel alignment. Bottom conditions consisted primarily of unvegetated fine sand and silt with leafy organic debris, while the area in the vicinity of the boat ramp was found to be coarse substrate consisting of cobble, gravel, and shell. Neither the sonar nor video capture data revealed any evidence of submerged historic properties.

No shipwrecks sites are located within the project area of potential effect. Additionally, areas considered sensitive for Native American shell midden sites were noted in various areas along the shoreline. Many of these sites have eroded or been so badly damaged that they are no longer considered significant. None of the archaeologically sensitive areas are located within the proposed channel's limits.

Therefore, the proposed navigation improvement project at the Great Chebeague Island Stone Pier with dredged material disposal at the previously-used Portland ocean disposal site will have no effect upon any historic properties in accordance with Section 106 of the NHPA and implementing regulations 36 CFR 800. The Maine State Historic Preservation Officer, in a letter dated July 24, 2019, has concurred with this determination. The Passamaquoddy Tribal Historic Preservation Officer was also provided an opportunity to comment on the proposed undertaking. No response was forthcoming; therefore, we assume concurrence with this determination in accordance with Section 106 and 36 CFR 800.

6.2.7 Socioeconomic Environment

Chebeague is one of fourteen remaining year-round island communities in the State of Maine and approximately 350 people live on the island year-round. The community depends upon safe and efficient navigation features so that vessels can provide services to the island, transit to and from the island, and to provide goods to the island. Safe and efficient navigation features such as the proposed channel and turning basin are essential for the Great Chebeague Island community. Improved access to the island will positively affect the socioeconomic environment of the island's community.

6.3 Effects of Proposed Action on the Disposal Site

6.3.1 Sediment and Water Quality

A split-hull scow will be used to transport the dredged material from Great Chebeague Island to the PDS where the material will be released at specified coordinates within the site. Dredged material released from the barge descends through the water column as a dense fluid-like jet. Within this well-defined jet, there will be solid blocks or clods of very dense cohesive material. During the descent, large volumes of water are entrained in the jet. Several factors, including turbulent shear, cause some of the material to be separated from the jet and "lost" from the immediate area. Based on several studies, the total amount of material dispersed over longer distances (i.e., deeper depths) is estimated to be one to five percent of the original material (Engler, 1986).

The USACE analyzed the resuspension potential of material placed at the Portland Disposal Site to determine if dredged material placed at the disposal site would remain stable, including during severe weather conditions. To determine this, modeling was performed using a modified LTFATE model and applied it to the Portland Disposal Site to assist in predicting the stability of the placed sediments (WES, 1998). The results of the model show that under normal conditions the material placed at the site is stable. But despite the depths of 40 to over 70 meters at the disposal site, storm waves from low frequency events have the potential to cause moderate erosion to the surficial sediments located only in the top 0.2 meters (WES, 1998).

The placement of the material from the proposed project at the PDS will not have long term negative impacts to the physical or chemical environment of the site. All impacts are anticipated to be short term and localized to the area of placement. Long term changes in the bathymetry of the PDS are expected and are monitored and managed by USACE and EPA.

6.3.2 Biological Environment

The biological community at a disposal site will reflect a level of disturbance immediately after disposal but then begin to recolonize once disposal is complete. Several surveys (SAIC, 1984; SAIC, 1985; SAIC, 1990; SAIC, 1996; AECOM, 2009; Battelle, 2020) of the Portland Disposal Site showed that the area recolonizes after disposal. After disposal, the predicted recolonization process occurs as a sequence of three stages of development, which is defined below (EPA, 1996).

Stage I organisms are small, opportunistic short-lived polychaete worms which rapidly (i.e. within two weeks) colonize new disposal mounds and do not penetrate into the sediments very deeply. Stage II species are tubiculous amphipods and surface deposit-feeding or filter-feeding mollusks that are expected to occur three to six months after disposal has terminated. These taxa represent a more transitional stage, which may or may not develop into a long-term benthic community. Stage III organisms represent an equilibrium level with organisms typified by deeper dwelling, head-down deposit-feeding polychaetes. This stage can also occur during the first year after disposal, but additional time for larval recruitment from off-site locations may be required. It is common to find more than one successional stage present at any one location. Repeated disposal at one location in the site may keep the benthic community at Stage I or II. However, infrequent use of the disposal site, may allow Stage III communities to develop.

The presence of rocky outcrops at the disposal site (which are not targeted to receive dredged material) tends to limit commercial fishing within the disposal site; however, lobster fishing occurs within and adjacent to the disposal site beginning in the fall when the lobsters migrate to deeper waters (EPA, 1996). Disposal operations may temporarily disrupt winter lobster fishing at the disposal site. A haul route (Figure EA-8) will be established and public noticed for the disposal vessel to avoid damaging fishing gear.

6.3.3 Threatened and Endangered Species

Disposal activities are not likely to adversely affect any Federally listed threatened or endangered species within the route to or within the PDS. Based on the information from U.S. Fish and Wildlife Service and National Marine Fisheries Service databases (IPAC and ESA mapper, respectively) Federally listed species under the jurisdiction of the Services are known to occur in the project area. However, based on the using time of year restrictions, the proposed construction efforts would occur outside of the periods when the listed species would be present in the project area. The USACE has made the determination that the disposal activities are therefore not likely to adversely affect any threatened or endangered species. Coordination with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding this determination is currently ongoing (Appendix A).

6.3.4 Essential Fish Habitat

Impacts to Essential Fish Habitat for managed species are documented in Section 6.2.4 of this report.

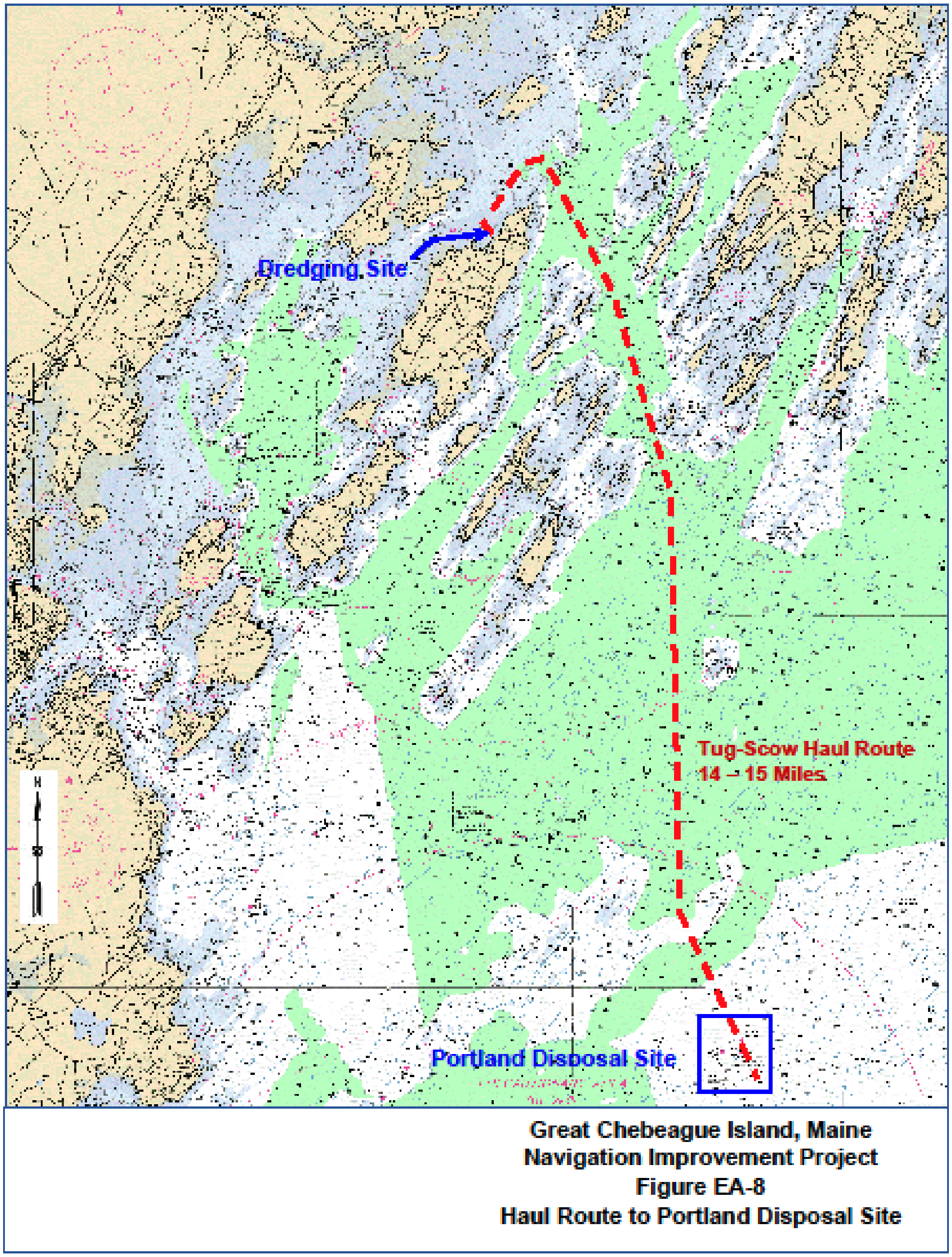


Figure EA-8. Proposed Haul Route To/From Great Chebeague Island and the Portland Disposal Site

6.3.5 Air Quality and Noise

Air Quality

The project should have no long-term impacts on air quality at the PDS. During construction, equipment operating on the site would emit pollutants, including nitrogen oxides that can lead to the formation of ozone. In order to minimize air quality effects during construction, construction activities would comply with applicable provisions of the Maine Air Quality Control Regulations pertaining to dust, odors, construction, noise, and motor vehicle emissions.

Noise

Minor increases in noise are expected as disposal operations will utilize tugs, scows, and support vessels. Noise sources will be from engines, generators, and other machinery associated with the afore mentioned equipment. An increase in noise in the project area will be temporary and noise levels will return to pre-construction levels following construction of the project.

6.3.6 Historic and Archaeological Resources

The placement of dredged material from the Chebeague Island navigation improvement project at the Portland Disposal Site, a previously utilized EPA designated open water placement site east of Cape Elizabeth, will have no effect upon any structure or site of historic, architectural, or archaeological significance as defined by the National Historic Preservation Act of 1966, as amended. As mentioned previously, the Maine State Historic Preservation Officer, in a letter dated July 24, 2019, has concurred with this determination. The Passamaquoddy Tribal Historic Preservation Officer was also provided an opportunity to comment on the proposed undertaking. No response was forthcoming; therefore we assume concurrence with this determination in accordance with Section 106 and 36 CFR 800.

6.4 Future Conditions with Proposed Project

6.4.1 Sediment and Water Quality

Following construction of the project, no anticipated future change to the physical and chemical environment are expected. It is assumed that natural shoaling processes will deposit sediments into the channel and turning basin and that future maintenance dredging would be required. The effects of maintenance dredging would be similar to those described in Section 6.3

6.4.2 Biological Environment

Impacts to the biological resources in the project area may be affected by sea level rise and climate change in the future. Future maintenance dredging efforts in the channel and turning basin areas will produce impacts similar to those described in Section 6.3.

6.4.3 Threatened and Endangered Species

Future conditions at the proposed dredge area and disposal site should have no effects on threatened or endangered species.

6.4.4 Essential Fish Habitat

Impacts to essential fish habitat in the project area may be affected by sea level rise and climate change in the future. Future maintenance dredging efforts in the channel and turning basin areas will produce impacts to essential fish habitat that are similar to those described in Section 6.3.

6.4.5 Air Quality and Noise

Future conditions at the proposed dredge area and disposal site should have no effects on air quality or noise.

6.4.6 Historic and Archaeological Resources

Future conditions at the proposed dredge area and disposal site should have no effects on historical or archaeological resources.

6.4.7 Socioeconomic Environment

Future impacts to the socioeconomic environment of the project area are expected to be positive. Improved navigation access to the Stone Wharf will allow the ferry and supply vessels to access the island safely and more efficiently. The island's population will have the greater ability to travel to and from the island and receive goods and services from the mainland which will improve socioeconomic conditions.

7.0 Environmental Justice and Protection of Children

Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" require federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its program, policies, and activities on minority and low-income populations in the U.S., including Native Americans. The proposed action will not have any disproportionately high or adverse impacts on minority or low-income populations, or any adverse short or long-term environmental justice impacts because the proposed action will be authorizing and dredging a Federal channel and anchorage area located in the waters off of Great Chebeague Island with placement of the dredged material in the Atlantic Ocean at PDS. No environmental justice populations are located in these areas.

Executive Order 13045, "Protection of Children From Environmental Health Risks and Safety Risks," requires federal agencies to identify and assess environmental health risks and safety risks that may disproportionately affect children. The proposed action will not pose any significant or adverse short or long-term health and safety risks to children because the dredging will take place in waters off of Great Chebeague Island and placement will be in the waters of the Atlantic Ocean. Furthermore, there are no playgrounds or schools nearby.

8.0 Cumulative Impacts

Cumulative impacts are those resulting from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. Past and current activities in the proposed project area include the maintenance dredging of the proposed project, maintenance of the town landing and piers, and navigation through the project. Reasonably foreseeable future actions include the continuation of maintenance and navigation activities. The effects of these previous, existing, and future actions are generally limited to infrequent disturbances of the benthic communities in the dredged areas. The direct effects of this project are not anticipated to add significantly to impacts from other actions in the area. Therefore, no significant adverse cumulative impacts are projected as a result of this project.

9.0 Actions Taken to Minimize Adverse Impacts

The following actions will be performed to minimize impacts to marine and estuarine resources, and water quality impacts, while conducting the proposed improvement dredging of the Great Chebeague Island Navigation Improvement Project. The following actions includes:

a. Dredging will be limited due to a time of year restriction to avoid lobster and other estuarine resources from October 1 through April 1.

b. A defined haul route to the Portland Disposal Site has been established to minimize impacts to fishing gear.

c. Impacts to 47,190 square feet (1.08 acres) of eelgrass and 26,830 square feet (0.61 acres) of intertidal habitat that will be permanently altered will be mitigated for.

10.0 Coordination

A public notice will be published announcing the availability of the Draft Detailed Project Report (DPR) and Draft Environmental Assessment and include instructions for the public and reviewing agencies to access the draft documents. During the 30-day comment period a public information may be held depending on the significance of requests received. The final DPR and EA will document and address all comments received including a record of any public meeting held.

The following agencies are being coordinated with:

Federal	U.S. Fish and Wildlife Service, Maine Field Office U.S. Environmental Protection Agency, Region 1 National Marine Fisheries Service, Greater Atlantic Regional Fisheries Office U.S. Coast Guard
Tribal	Passamaquoddy Tribal Historic Preservation Officer, Princeton, Maine
State	Maine Department of Environmental Protection Maine Geologic Survey Maine Department of Marine Resources Maine Coastal Program Maine Historic Preservation Commission, Augusta, Maine
Municipal	Town of Chebeague Island Chebeague Transportation Company

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12.0 COMPLIANCE WITH ENVIRONMENTAL FEDERAL STATUTES AND EXECUTIVE ORDERS

Federal Statutes

1. Preservation of Historic and Archeological Data Act of 1974, as amended, 16 U.S.C. 469 et seq.

Compliance: Not Applicable; Project does not require mitigation of historic and/or archaeological resources at this time.

2. Clean Air Act, as amended, 42 U.S.C. 7401 et seq.

Compliance: Public notice of the availability of this report to the Environmental Protection Agency signifies compliance pursuant to Sections 176c and 309 of the Clean Air Act.

3. Clean Water Act of 1977 (Federal Water Pollution Control Act Amendments of 1972) 33 U.S.C. 1251 et seq.

Compliance: Not Applicable; project does not involve the discharge of dredged or fill material into waters of the State of Maine.

4. Coastal Zone Management Act of 1972, as amended, 16 U.S.C. 1451 et seq.

Compliance: A Federal CZM consistency determination will be submitted to the State of Maine.

5. Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq.

Compliance: Coordination with the U.S. Fish and Wildlife Service (FWS) and/or National Marine Fisheries Service (NMFS) is currently taking place.

6. Estuarine Areas Act, 16 U.S.C. 1221 et seq.

Compliance: Not Applicable; this report is not being submitted to Congress.

7. Federal Water Project Recreation Act, as amended, 16 U.S.C. 4601-12 et seq.

Compliance: Public notice of availability to this report to the National Park Service (NPS) and Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

8. Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661 et seq.

Compliance: Coordination with the FWS, NMFS, and Maine Department of Marine Resources signifies compliance with the Fish and Wildlife Coordination Act.

9. Land and Water Conservation Fund Act of 1965, as amended, 16 U.S.C. 4601-4 et seq.

Compliance: Public notice of the availability of this report to the National Park Service (NPS) and the Office of Statewide Planning relative to the Federal and State comprehensive outdoor recreation plans signifies compliance with this Act.

10. Marine Protection, Research, and Sanctuaries Act of 1971, as amended, 33 U.S.C. 1401 et seq.

Compliance: Public notice of the availability of this report for public review, including an evaluation and findings concerning the transportation or disposal of dredged material in ocean waters pursuant to Section 102 and 103 signifies compliance with this Act.

11. National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq.

Compliance: Coordination with the State Historic Preservation Office determined that no historic or archaeological resources would be affected by the proposed project (see letter dated July 24, 2019).

12. National Environmental Policy Act of 1969, as amended, 42 U.S.C 4321 et seq.

Compliance: Preparation of this report signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact is issued.

13. Rivers and Harbor Act of 1899, as amended, 33 U.S.C. 401 et seq.

Compliance: No requirements for Corps of Engineers projects or programs authorized by Congress. The proposed navigation improvement project is included under the continuing authority of the Rivers and Harbors Act.

14. Watershed Protection and Flood Prevention Act as amended, 16 U.S.C 1001 et seq.

Compliance: No requirements for Corps' activities.

15. Wild and Scenic Rivers Act, as amended, 16 U.S.C 1271 et seq.

Compliance: Not Applicable.

16. Archaeological Resources Protection Act of 1979, as amended, 16USC 470 et seq.

Compliance: Not applicable to this project.

17. American Indian Religious Freedom Act of 1978, 42 U.S.C. 1996.

Compliance: Not applicable

18. Native American Graves Protection and Repatriation Act (NAGPRA), 25 U.S.C. 3000-3013, 18 U.S.C. 1170

Compliance: Not applicable; regulations implementing NAGPRA for the discovery of human remains and/or funerary items are only applicable on Federal or Indian lands.

19. Magnuson-Stevens Act, as amended, 16 U.S.C. 1801 et seq.

Compliance: Coordination with the National Marine Fisheries Service and preparation of an Essential Fish Habitat (EFH) Assessment signifies compliance with the EFH provisions of the Magnuson-Stevens Act.

20. Marine Mammal Protection Act of 1972, 16 U.S.C. 1361-1407.

Compliance: Coordination with the National Marine Fisheries Service (NMFS) is currently taking place.

21. Coastal Barrier Resources Act, 16 U.S.C. 3501 et seq.

Compliance: Coordination with the US Fish and Wildlife Service is currently taking place. No impacts to coastal barrier units are expected as a result of this project.

Executive Orders

1. Executive Order 11988, Floodplain Management, 24 May 1977 amended by Executive Order 12148, 20 July 1979.

Compliance: The project is not anticipated to impact the floodplain.

2. Executive Order 11990, Protection of Wetlands, 24 May 1977.

Compliance: Not Applicable; project does not involve nor impact wetlands.

3. Executive Order 12114, Environmental Effects Abroad of Major Federal Actions, 4 January 1979.

Compliance: Not Applicable; project is located within the United States.

4. Executive Order 12898, Environmental Justice, 11 February 1994.

Compliance: Not Applicable; the project is not expected to have a significant impact on minority or low-income populations, or any other population in the United States.

5. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks.

Compliance: Not Applicable; the project will not create a disproportionately high environmental health or safety risk for children.

6. Executive Order 11593, Protection and Enhancement of the Cultural Environment, 13 May 1971

Compliance: Coordination with the State Historic Preservation Officer signifies compliance.

7. Executive Order 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable unless on Federal Lands, then agencies must accommodate access to and ceremonial use of Indian Sacred Sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

8. Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, 6 November 2000.

Compliance: Consultation with Indian Tribal Governments, where applicable, and consistent with executive memoranda, DoD Indian Policy, and USACE Tribal Policy Principles signify compliance.

9. Executive Order 13061, Federal Support of Community Efforts Along American Heritage Rivers.

Compliance: Not applicable. Project is not located within an American Heritage River.

10. Executive Order 13175, Invasive Species. February 1999. Federal Agencies may not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species.

Compliance: No invasive species will be introduced or spread as a result of this project. Therefore the proposed project is in compliance with this Order.

Executive Memorandum

1. Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing NEPA, 11 August 1980.

Compliance: Not applicable; the project does not involve or impact agricultural lands.

2. White House Memorandum, Government-to-Government Relations with Indian Tribes, 29 April 1994.

Compliance: Consultation with Federally Recognized Indian Tribes, where appropriate, signifies compliance.