DRAFT

ENVIRONMENTAL ASSESSMENT

BASS HARBOR
TREMONT, MAINE

FEDERAL NAVIGATION PROJECT
MAINTENANCE AND IMPROVEMENT

Prepared by:

Engineering/Planning Division
U.S. Army Corps of Engineers
New England District
Concord, Massachusetts

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Table of Contents **Page #**

List of Figures

ENVIRONMENTAL ASSESSMENT

I. INTRODUCTION

The purpose of this Environmental Assessment (EA) is to present information on the environmental features of the proposed Bass Harbor navigation improvement and maintenance dredging project and to review design information to determine the potential impacts of the action. 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 include biological sampling, sediment analysis, review of available information, and coordination with appropriate environmental agencies and knowledgeable persons. This report provides an assessment of environmental impacts and alternatives considered along with other data applicable to the Clean Water Act Section 404 (b)(1) Evaluation requirements.

II. GENERAL

Bass Harbor is located in northeastern Maine on the southwestern end of Mount Desert Island about 13 miles southwest of Bar Harbor (See Figure 1). Bernard and Bass Harbor are the two commercial fishing villages operating out of Bass Harbor.

The New England District is currently conducting an investigation to determine the feasibility of providing additional anchorage and channel area to the existing Federal navigation project in Bass Harbor, Maine.

III. PROJECT AUTHORITY

The existing Federal project at Bass Harbor was adopted 7 May 1962 by the Chief of Engineers under authority of Section 107 of the 1960 River and Harbor Act. The project provides about 24 acres of anchorage in three basins at the south end of Tremont, Maine (Mount Desert Island) (See Figure 2). The project, which was completed in August 1964, consists of the following:

1. A 10-acre anchorage (6 feet MLW) at the head of the harbor;
2. An 8-acre anchorage (10 feet MLW) at the inner harbor;
3. A 6-acre anchorage (6 feet deep MLW) on the southwest side of the inner harbor.

The Town of Tremont, Maine has requested that the Corps of Engineers conduct an investigation on the feasibility of expanding the anchorage space in the harbor and reestablishing the project depth in the upper anchorage. After a reconnaissance study it was determined that navigation improvements were economically feasible and that further detailed study was warranted. Additionally, the maintenance dredging of portions of the anchorage areas will be done simultaneously.

Figure 1 Bass Harbor

Figure2 Bass Harbor FNP

IV. PURPOSE AND NEED

There has been a steady increase in the size and number of boats using the harbor since the construction of the Federal Project in 1964, which was designed to provide for 70 commercial and 7 recreational vessels. The existing fleet consists of 90 commercial and 55 recreational boats. In addition there are transient scallop and crab boats, with local vessels servicing the salmon farms in Blue Hill Bay and providing cargo transport to offshore islands.

Overcrowding in the anchorages during the summer results in congestion related delays and damages to both the commercial fishing fleet and recreational boaters. There are approximately 80 commercial boats and 20 recreational boats mooring in the Federal project during the summer months. Providing additional anchorage and/or a channel would alleviate overcrowded conditions in the harbor and improve navigational efficiency.

Local interests have upgraded onshore facilities as needed, and harbor management plans along with related town ordinances have been implemented showing local commitment to harbor improvements.

V. PROJECT DESCRIPTION

The proposed navigation improvement project (See Figure 3) provides for the following:

1. Designate an entrance channel 80 feet wide by 10 feet deep at MLLW, located along the western side of the existing 10-foot deep (MLLW) Federal anchorage, and dredge a compensatory area of anchorage 8 feet deep at MLLW and 80 feet wide to the east of the 10-foot anchorage to replace area lost to the channel;

2. Extend the proposed 8-foot deep (MLLW) by 80 foot wide area northerly to provide a channel connecting the existing northern 6-foot deep (MLLW) anchorage with the 10-foot anchorage to improve passage between the upper and lower harbor basins;

3. Dredge approximately 5.6 acres of additional anchorage area by expanding the existing northern 6-foot MLLW Federal anchorage northeasterly.

A mechanical dredge would be used to remove approximately 58,000 cubic yards (cy) of silty-sandy dredged material. For navigation improvement, approximately 46,600 cy would be removed from the 6-foot anchorage area expansion and approximately 6,800 cy would be removed from the 8-foot compensatory anchorage widening. Blasting would also be required to remove approximately 1,000 cy of ledge material from the 8-foot area. Neither the 10-foot channel designation nor the 8-foot connecting channel would require removal of any material. For maintenance dredging, approximately 3,800 cy of silty material would be removed from the northern 6-foot anchorage and approximately 800 cy of silty material would be removed from

Figure 3. Bass Harbor Improvements

the western 6-foot anchorage area. Dredged material would be transported approximately 4 miles to a site (Eastern Passage disposal site) between Dodge Point and Bar Island for open-water disposal.

VI. ALTERNATIVES

Alternative 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, modification of the existing Federal navigation project for Bass Harbor, Maine would not take place. Without a Federal navigation project the continuation of the existing overcrowded conditions in the harbor would persist and the associated delays and damages would continue. Therefore, because of these conditions that would continue without a Federal navigation project, the No Action Alternative was not considered a viable alternative. "

Alternative 2. Non-Structural Alternatives.

The original Federal project was designed to accommodate both recreational and commercial vessels. Fleet transfer of either the commercial and/or recreational fleets were considered as non-structural alternatives.

Bass Harbor is one of the few commercial harbors in the area that can be used year-round. As a result, many of the boats from nearby harbors are moved to Bass Harbor during the winter months. Therefore, the transfer of the commercial fleet was not considered to be a viable alternative.

Approximately 23 recreational boats moor in deep water outside the inner harbor during the summer months, with 12 based at slips in the inner harbor. The transfer of additional recreational boats to the outer harbor was considered as a non-structural alternative. The movement of the recreational fleet is inconsistent with the Town's plan for harbor development, which calls for segregating recreational boaters in the northern section of the inner harbor. Placing the vessels in the outer harbor takes the boaters away from the inner harbor facilities and leaves them in a less protected area. The non-structural alternative would likely result in loss of vessels, increased annual damages, decreased incidental recreational value and increased labor costs and was not recommended as a viable plan.

Alternative 3. Dredging Alternatives

Both the anchorage and channel were economically justified as separable incremental items in the plan formulation process. Designation of the channel with construction of the

compensatory anchorage area would require only minor dredging but would not relieve much of the damages and delays associated with congestion in the anchorage areas. Economic analysis revealed that the combined anchorage and channel plan provide the greatest net economic benefits and is therefore recommended as the proposed plan.

It was estimated that approximately 5.6 acres of additional anchorage were required to provide for the needs of the year-round commercial fleet mooring inside the harbor. Various configurations and locations for the anchorage were evaluated to develop plans that minimize both construction costs (e.g., the amount of dredging) and environmental impacts (e. g., the loss of intertidal habitat).

The area to the northwest of the existing anchorage was originally proposed for the additional anchorage. Investigations in this portion of the harbor revealed shallow depths and significant intertidal habitat that would increase the costs and environmental impacts of the project. Chemical testing also indicated elevated levels of PCBs in the sediments from this area. This area was eliminated from further considerations.

Consideration was given to creating an anchorage to the east of the proposed 10-foot channel beyond the area allocated to the 80-foot wide compensatory expansion. A review of borings taken in 1962 and 1987 revealed significant ledge material at shallow depths. This would require additional blasting, increasing costs and environmental impacts of the project.

The area northeast of the existing anchorage was chosen as the best site for the anchorage. Environmental and economic costs are minimized by taking advantage of deeper waters in the natural channel area. This configuration and plan represents the smallest amount of intertidal habitat that would need to be removed in order to accommodate the existing fleet.

Alternative 4. Disposal Alternatives

Upland disposal. Placing the dredged material in an upland disposal area was considered for this project. However, the local sponsor has indicated that there are no suitable upland sites available for material disposal.

Beach disposal. Placing the dredged material on or along nearby beach areas was considered for this project. However, the material to be dredged consists of mostly fine-grained silty sediments and rock and would not be suitable for beach disposal.

Open water disposal. Four open water disposal sites were examined. The first site is located approximately 2 miles from the project area off of Placentia Island (See Figure 4). This deep-water (100 feet) site was used previously in the 1960's for disposal of material removed from Bass Harbor. Disposal of material at Placentia Island is regulated under Section 103 of the Ocean Dumping Act.

The second site is located in about 300 feet of water between Long Island and Bartlett Island (Figure 4). This area is approximately 12 nautical miles from Bass Harbor. Bartlett Island is located landward of the Territorial Sea Baseline, therefore disposal of material would be regulated under Section 404 (b) 1 of the Clean Water Act.

The third site, Eastern Passage Disposal Site (EPDS), is located in the Eastern Passage to Blue Hill Bay in approximately 330 feet of water (See Figure 5). The site is located between Bar Island and Dodge Point. This area is approximately 6 miles from Bass Harbor. BHDS is located landward of the Territorial Sea Baseline, therefore disposal of material would be regulated under Section 404 (b) 1 of the Clean Water Act.

A fourth site, the Tuppers Ledge disposal site (refer to Figure 4), is located at the head of Union River Bay, about 21 miles by sea from Bass Harbor. This site was last used for disposal of maintenance material from the Federal navigation project at Union River in Ellsworth and from improvement dredging of the City's municipal mooring areas. This work was undertaken in 2001 to 2003. Prior to this the site had last been used in about 1911. This site is too far from Bass Harbor to provide an economical disposal option as the long haul distance would require multiple scows to maintain dredge production rates capable of completing the work within the allowed dredging window.

VII. AFFECTED ENVIRONMENT

A. Dredging Site

1. Physical Environment

Bass Harbor is a well-protected coastal embayment located in the southwestern end of Mount Desert Island. Several small islands (Placentia, Great Gott, Little Gott and Block Islands) protect the harbor from the south. Bass Harbor Head on the west and Lopaus Point on the east form a semi-protected outer Harbor with water depths in the 30 to 40 foot range (MLLW).

The inner harbor is more protected and shallower than the outer portion of the harbor. The shoreline is a mixture of rocky outcrops, low energy beaches, and tidal flats. There are extensive intertidal flats in the northern portions of the harbor. Bass Harbor marsh is located in the northern portion of the harbor where freshwater from Heath Brook and Buttermilk Brook meets the saline harbor water. Halfway Brook drains into the tidal flats in the northwestern portion of the Harbor. Both of these areas contain significant palustrine and estuarine wetlands.

Sediment samples from the Bass Harbor area taken in 1985, 1986, 1987, and 2002 reveal that most of the material consists of fine silts and clays with a small sand component (10-20%). Coarser sediments (30-50% sand) were observed in the tidal channels. See Appendix C for complete grain size data.

Figure 4. Disposal Site

Figure 5. Disposal Site

2. Chemical Environment

Material to be dredged from Bass Harbor was tested for contaminants of concern in 1985, 1987, and in 2002. In general, the material from Bass Harbor has low levels of contamination with the exception of the northwestern portion of the harbor, which contains elevated levels of PCBs. The northwestern portion of the harbor will not be dredged.

Ten samples were taken in 1985 and four samples were taken in 2002 for chemical analysis. Sediments in both efforts consisted of dark gray organic sandy/silty/clay (See Appendix C). Concentrations of metals in the sediments in 1985 were low. With the exception of nickel and vanadium, all metal concentrations were low when compared to the State's classification of dredged material. The analytical detection limits for nickel and vanadium were above the Class I criteria. Therefore, there is no reason to suspect contamination of either of these two metals. The metal concentrations in all samples taken during the 1987 and 2002 sampling efforts fell with in the State of Maine's Class I category for dredge material.

High values for PCBs were observed for samples in the northwestern portion of the harbor in 1985 (Stations A and E, 51.0 and 20.0 ppm respectively) while low values were also observed in two samples in the same area (G and B, 3.4 and 1.4 ppm, respectively). The remainder of the samples were below 1.0 ppm. Samples were taken again in 1986 (Samples K - O) to further investigate potential for PCB contamination in the northwestern portion of the project. Samples M and N indicated PCB levels at low but detectable levels, 0.007 and 0.006 ppm respectively. Other samples were below detection limits. Given the potential PCB problem, the northwestern area was eliminated from further consideration. Plans were then investigated to take advantage of the northeastern portion of the harbor. Sediment samples taken in 1987 (Samples P - T) indicated that PCB levels were below detection limits. The 2002 sampling effort revealed that PCB levels in the samples tested were also below detection limits.

Elutriate testing was done in 1985 and 1987 from selected stations within the harbor (Appendix C). These tests indicated that there was the potential for slight releases of copper, mercury, cadmium and arsenic during dredging operations. The potential release of PCBs was also evaluated using the elutriate test. Test results from the 1985 and 1987 sampling efforts showed no tendency for the release of PCBs during dredging.

3. Biological Environment

There are extensive intertidal flats in the inner harbor. The majority of flats are located in the northern section of the inner harbor. These mudflats support dense assemblage of benthic invertebrates including soft-shell clams, polychaete worms, mud snails, and amphipods. Mudflats are productive areas that provide forage area for resident and migratory birds and fish species.

Herring gulls, great black-backed gulls and black ducks are likely to be found feeding on intertidal flats year round. Shorebirds, Bonapartes gulls, and ring-billed gulls are likely to be

abundant in the fall months. Semipalmated sandpipers, short-billed dowitchers, and black bellied plovers are likely to be present in the fall. The mudflats in eastern Maine are thought to be especially critical to migrating semipalmated plovers. A variety of waterfowl, seabird, and other aquatic bird species such as loons, oldsquaw, bufflehead, mallard, and black duck use the area for feeding.

Benthic community structure within the proposed project area was surveyed in August 1987 and August 2001. A mussel bed covers a portion of the intertidal habitat in the vicinity of the proposed anchorage. In 1987, four stations from the subtidal and low intertidal portions of the anchorage area to be improved were sampled using a 0.04 m^2 Van Veen grab. Samples were sieved on site through 0.5 mm mesh screen, stained with Rose Bengal, preserved in 10% buffered formalin, sorted, and identified to the lowest possible taxon. In 2001, seven stations from the subtidal and low intertidal portions of the entire project area were similarly sampled. A summary of the benthic data, including station locations, is presented in Appendix B.

The 1987 anchorage area sampling revealed that (excluding nematodes) Annelids were the dominant taxon in all samples accounting for 87.7 to 95.2% of all macrofaunal organisms. Among the Annelids, oligochaetes were the dominant taxon. The polychaetes *Streblospio benedicti*, *Nephtys incisa*, Cirratulid sp., *Chaetozone* sp. A, *Caullierella* sp., and *Pygospio eleqans* were also abundant. Molluscs, which accounted for 2.0 to 4.1% of the organisms, were represented by the bivalves *Mytilus edulis* and *Mya arenaria*. Arthropods made up 1.1 to 8.9% of the individuals. The low intertidal stations had slightly higher polychaete abundance than the subtidal stations which had a higher percentage of arthropod species. Benthic densities ranged from 3,425 to 19,993 individuals per m^2.

The 2001 sampling effort supplemented the existing benthic data by characterizing a larger portion of the project area and reexamining the 1987 stations. The stations located in the subtidal channel areas were dominated Annelids. Oligochates, and the polychaetes *Chaetozone setosa* and *Nereis diversicolor* were among the dominant taxa. The mollusc *Modiolus modiolus* (the horse mussel) was also present at each station. Densities of benthic organisms from the channel stations ranged from 575 to 1,625 individuals per m^2. The stations located in the subtidal areas of the proposed anchorage areas were dominated by oligochaetes, with the polychaete *Streblospio benedicti* and the arthropod *Unciola irrorata* also present. Densities from these areas ranged from 6,725 to 13,400 individuals per m^2. The stations located in the low-intertidal areas of the proposed anchorage areas were also dominated by oligochaetes and various species of polychaetes. Polychaete species present included *Chaetozone setosa, Polydora websteri, Aricidea jeffreysii*, and *Streblospio benedicti.* Densities in these stations ranged from 1,475 to 23,225 individuals per m^2. The densities and species reported here, from both the 1987 and 2001 data, are typical of mudflats in eastern Maine.

4. Threatened and Endangered Species

Endangered species coordination, pursuant to the Endangered Species Act, with the U.S. Fish and Wildlife Service and National Marine Fisheries Service indicates that nesting bald

eagles, fall migrant peregrine falcons, humpback whales, fin whales and possibly right whales may be present in the project area. Harbor seals may also be present in the project area.

A nesting pair of bald eagles has historically used several nest sites in Bass Harbor Marsh, approximately 1 mile north of the dredge site. There is an active nest site on the southeast corner of Placentia Island. Historically, there has been an active eagle nest about 0.5 miles east of Western Point on Bartlett Island.

5. Essential Fish Habitat

Pursuant to the Magnuson Stevens Act, information on essential fish habitat in the project area is required. According to NMFS source documents, fifteen (15) Federally managed species have EFH designations within the area that encompasses the Bass Harbor. These 15 species include:

Atlantic salmon (Salmo salar); Atlantic cod (Gadus morhua); pollock (Pollachius virens); whiting (Merluccius bilinearis); red hake (Urophycis chuss); white hake (Urophycis tenuis); winter flounder (Pleuronectes americanus); yellowtail flounder (Pleuronectes ferruginea); windowpane flounder (Scopthalmus aquosus); American plaice (Hippoglossoides platessoides); ocean pout (Macrozoarces americanus); Atlantic sea scallop (Placopecten magellanicus); Atlantic sea herring (Clupea harengus); Atlantic mackerel (Scomber scombrus); and bluefin tuna (Thunnus thynnus).

6. Historic and Archaeological Resources

Prehistoric Resources. Mount Desert Island was the site of prehistoric occupation from at least as early as 4000 B.C. Archaeological investigations in the vicinity of Ellsworth have uncovered prehistoric sites which have been dated to the Late Archaic period (4,000 B.C.-1,000 B.C.). Prehistoric material which can be dated to 1000 A.D. has been found near Blue Hill, Hancock Point, and Ellsworth. These sites are attributed to the Red Paint People, a group so called because their burials contain caches of red and yellow ochre.

The first European visitors to the area encountered Amerindian groups on Mount Desert Island. These people were Penobscots, members of the larger group known as the Abenakis. The Penobscots were seasonal residents of Mount Desert Island, arriving in the summer to fish and harvest clams. At points on Frenchman's Bay and the shores of Mount Desert Island near the tidal flats, they would set up temporary camps: Shell middens have been found at Northeast Harbor, on Fernalds Point and at the entrance to Somes Sound. As the Europeans began to settle in the area during the late eighteenth century, the Penobscots gradually ceased coming to the island.

There is also the possibility that the proposed project area may have prehistoric site potential. There is the possibility that some coastal areas may contain early archaeological sites

which have been submerged by subsequent sea level rises. As an example of the type of site that might be affected, there is a known circa 6,000 year old archaeological site yielding stone tools in 25 feet of water near the Lazygut Islands off Deer Isle. Additional field investigations, conducted in conjunction with subsurface investigations during preparation of plans and specifications, would need to be done to look for intact submerged land surfaces in any proposed dredging areas.

Historic Resources. The Isle of Mount Desert was visited early in the 17th century by the French and English, but it was not until the latter half of the 18th century that permanent settlement began on the island. The major occupations during the 18th and 19th centuries were fishing, lumbering and shipbuilding. By the late 1800s shipbuilding was declining but tourism was becoming a major industry. The economy of Mount Desert continues to be largely based on tourism and fishing.

The first known visit by a European to Mount Desert Island was by Samuel de Champlain in 1604. He was sent by Sieur de Monts who had a grant from France for the entire French claim to North America from Montreal to Philadelphia. The first colony on the island was a short-lived Jesuit mission sent in 1613. The mission was forced from the island the same year by the English, who also laid claim to the area. The next visitor to Mount Desert was the Sieur de Cadillac who obtained a grant for land which encompassed the island. He and his bride spent one summer and then departed in 1689.

In 1760 the French and Indian wars were over and there was no longer any danger of Indians raiding settlements on the New England frontiers. Systematic settlement of Mount Desert Island began in 1761. Abraham Somes and James Richardson of Gloucester, MA settled at what is now Somesville. In 1762 the family of Stephen Richardson were the first to settle at Bass Harbor. By 1770 there were only two families living at Bass Harbor, the Stephen Richardsons and the Job Dennings.

The settlement of Mount Desert Island occurred steadily. Most of the settlers were from Cape Ann, Cape Cod or southern Maine and settled near one of the many harbors on the island. In 1789 the island was incorporated as the town of Mount Desert. In 1796, the town of Eden was separated from Mount Desert and in 1848 the town of Tremont was incorporated.

The economy of Mount Desert was based on lumber and fishing. Shipbuilding was a major occupation during the mid 19th century. These vessels carried fish and lumber to the markets of Portland, Baltimore and as far away as the West Indies and South America. Bass Harbor, Southwest Harbor and Cranberry Harbor became prosperous fishing ports, with 85 ships using their harbors in 1837. The main catch was herring and menhaden and facilities were erected on the shore for smoking the fish and extracting the oil. This seafaring economy reached its height in the 1880s. Shipbuilding declined with the advent of steam-powered ships, but fishing still remains a major industry in Bass Harbor.

After the Civil War, the economy of Mount Desert Island was based largely on tourism. Steamboats began making regular trips to the island from Portland and Boston. By 1887 there were 37 hotels on Mount Desert Island, although none were located at Bass Harbor. Tourism is still the mainstay of the Mount Desert Island economy.

A review of shipwreck files indicates there is one known shipwreck located in Bass Harbor. The schooner, Wreath, sank in the harbor on 11 July 1888. It is unknown if the Wreath was ever removed or if this schooner or any other shipwrecks are located in the vicinity of the proposed Navigation Improvement project.

7. Social and Economic Resources

The population of Tremont is 1,529 year round residents (2000, Census). During the summer months the community expands due to an influx of tourists. While tourism is a major industry for the area, Bass Harbor has fewer motels and restaurants than do other communities on the island. Bass Harbor is a viable year round community with pursuits other than tourism. Tremont and the surrounding area derive their livelihood directly from the harbor. The harbor is popular because it is spacious and well protected. Fishing, particularly lobstering, is a significant economic pursuit. Bass Harbor has the largest fishery on Mount Desert Island.

Bass Harbor currently has 83 commercial boats working out of the harbor and the majority of these boats are lobster boats. Most of the fishermen are able to operate year round as there is minimal ice damage to vessels during the winter. There are three major wholesalers in the Tremont area which deal with lobsters, scallops, groundfish and crab. Several boat building and repair facilities operate out of Bass Harbor. The State operates a ferry service to Swans Island and maintains a terminal located on the Bass Harbor Village side of the harbor, just south of the entrance to the inner harbor. These activities contribute to the year round economic viability of the town.

8. Air Quality

Portions of the state of Maine are designated as non-attainment zones for ozone (O_3). Maine is part of the Northeast Ozone Transport Region, which extends northeast from Maryland and includes all six New England states. Non-attainment zones are areas where the National Ambient Air Quality Standards (NAAQS) have not been met. The proposed project is located in Hancock County, Maine which is designated as a non-attainment zone. Nitric oxide (NO), hydrocarbons, oxygen (O_2), and sunlight combine to form ozone in the atmosphere. Nitrogen oxides are released during the combustion of fossil fuels.

B. Alternative Disposal Sites

1. Physical Environment

The Placentia Island site was used for the disposal of material generated during construction of the original Federal Project in 1964. The location of the area is described as an

"area southerly of a line drawn between Bass Harbor Head light and North Point on Swans Island and westerly of a line drawn tangent to the northeasterly side of Placentia Island and the southwesterly end of Little Gott Island in not less than 100 feet of water." The vertex for this angle is at coordinates 44° 12' 48" Latitude 68° 22' 12" Longitude. The sediments at Placentia Island consist of silty sand (48% sand 46% silty). Most of the samples had some shell fragments and one sample had a significant (31%) gravel component. The Maine Geological Survey examined the Placentia Island site and found tidal current and bathymetric conditions to be suitable for disposal of sediment from Bass Harbor.

The Bartlett Island site is located in approximately 300 feet of water between Long Island and Bartlett Island (44° 20' 7", 68° 28' 4"). This area is approximately 11 nautical miles from Bass Harbor. Bartlett Island is located landward of the Territorial Sea Baseline. The Bartlett Island sediments consisted of dark-gray, highly plastic clay. Approximately 97% of the material from the Bartlett Island site was in the clay-size range. Median grain size was between 3-4 microns. The Bartlett Island site is essentially a deep trough (300 feet deep) that is approximately 0.2 mile long.

The Eastern Passage Disposal site is located in approximately 330 feet of water between Bar Island and Dodge Point in the Eastern Passage. This area is approximately 6 nautical miles from Bass Harbor. The Eastern Passage Disposal site is located landward of the Territorial Sea Baseline. The sediments at this site consisted of dark-olive, silty-sand. Approximately 80-90% of the material from the Eastern Passage Disposal site was in the silt-size range (See Appendix C). The Eastern Passage Disposal site is essentially a deep (330 feet deep) depositional area.

The Tuppers Ledge disposal site is located in about 50 feet of water west of Tuppers Ledge at the head of Union River Bay. This area is about 21 nautical miles from Bass Harbor within state waters. A substantial disposal mound was created by the recent use of the site for Corps and City of Ellsworth dredging projects in the Union River. The site is now largely covered by a mound consisting of mixed sand, silt, clay, boulders, sawdust and other dredged sawmill waste, including waste lumber, bark and other debris.

2. Chemical Environment

No chemical analyses of the sediments at the alternative disposal sites were conducted. Since the disposal sites are deep depositional areas that are not located near known sources of contamination, it is assumed that the existing material consists of clean silty material or former dredged materials.

3. Biological Environment

Placentia Island. Previously existing benthic community information indicates that the benthic communities at the Placentia Island site are dominated by molluscs. Molluscs accounted for approximately 65% of all organisms collected. The small deposit feeding bivalve *Nucula delphinodonta* was the most abundant species with densities of 12,530 per m^2. *Nucula* accounted

for 88.5% of the bivalves and 57.7% of the total samples. The cockle *Thyasira* was also abundant (350 per m^2). *Sphenia sincira,* a small clam resembling juvenile *Mya,* was present at 300 per m^2. Polychaete species present at densities of 5905 per m^2 made up 30.7% of the organisms. Five species (unidentified Cirratulidae, *Euchone rubrocincta*, *Ninoe nigripes, Cossura coasta* and *Mediomastus ambiseta)* represented the majority of the polychaete species present. Arthropod species comprised 4% of the community with *Leptocheirus pinguis*, *Harpinia propinqua*, and *Eudorella pusilla* accounting for 86% of the arthropod species. This type of benthic community could provide forage grounds for many small bottom feeding fish.

The area off of Placentia Island is fished for lobsters 9 months of the year. Approximately 24 boats fish this area through the fall. In the winter most boats switch to sea scallops which are also harvested commercially off of Placentia Island. No specific resource information on the density of lobsters or scallops is available. The town has informed the Corps that this proposed disposal area is fished regularly. The Town expressed concern over potential impacts of disposal at Placentia Island to these resources.

Bartlett Island. The Bartlett Island area does not appear to be fished by local fishermen. As with the Placentia Island site, previously existing benthic community information for the Bartlett Island site was utilized. The site is similar in species composition to the Placentia Island site. *Nucula delphinodonta* is the dominant organism at the site, accounting for 60% of the community. Polychaete species comprise approximately 34% of the community.

Eastern Passage Disposal Site. The area surrounding this deep hole appears to be fished by local fishermen. Benthic community analysis for the Blue Hill Bay site was performed in September of 2002. The benthic assemblage at the site is similar to the previously mentioned sites. *Nucula* sp. is the dominant organism at the site, accounting for 90% of the community. Polychaete species comprise approximately 9% of the community.

Tuppers Ledge Disposal Site. The site is on a plain sloping slightly to the west. Benthic community analysis for the site was performed prior to its use for disposal in 2001. However the site has been largely covered by the disposal mound. For the next several years the site will be the subject of monitoring and investigation in the recovery of the benthic in a mound composed partially of sawdust and other century-old mill waste. Other Maine harbors (though not Bass Harbor) have similar problems with mill waste as a component of dredged material, and it is hoped that monitoring of the Tuppers Ledge site will lead to a better understanding of the impacts of such activity and better management tools for disposal of such sediments.

4. Threatened and Endangered Species

Coordination with NMFS and USFWS identified humpback whales (*Megapetera novaengliae*), right whales (*Eubalaena glacialis*), fin whales (*Balaenoptera physalus*), and harbor seals (*Phoca vitulina*) as having the potential to occur at all the disposal sites considered for this project. Additionally, bald eagles have been documented to occur in the vicinity of the Placentia and Bartlett island sites.

5. Essential Fish Habitat

EFH designations in the alternative disposal sites are the same as for the project area. A list of species with EFH designations in the disposal area can be found in Section VII.A.5.

6. Historic and Archaeological Resources

The alternative disposal sites have little archaeological potential. The sites are located in deep water so the possibility of the area containing submerged prehistoric sites is unlikely. The site off of Placentia Island was previously used for disposal of dredged materials, therefore any sites which may have been present would have been severely modified and no longer possess any archaeological potential. The Eastern Passage Disposal Site is also located in deep water so the possibility of the area containing submerged prehistoric sites is unlikely. There are no known shipwrecks in the vicinity of these areas.

7. Social and Economic Resources

The alternative disposal sites provide a varied source of economic value. The Placentia Island site is fished by commercial fisherman and is considered a valuable resource by the local fishing fleet. The Bartlett Island site is not fished. The Tuppers Ledge site is a significant distance from Bass Harbor and will be subject to monitoring studies for several years. The ledge area around the Eastern Passage Disposal Site is fished, however, the deep hole at the site is not fished.

8. Air Quality

Portions of the state of Maine are designated as non-attainment zones for ozone (O_3). Maine is part of the Northeast Ozone Transport Region which extends northeast from Maryland and includes all six New England states. Non-attainment zones are areas where the National Ambient Air Quality Standards (NAAQS) have not been met. The proposed project is located in Hancock County, Maine which is designated as a non-attainment zone. Nitric oxide (NO), hydrocarbons, oxygen (O_2), and sunlight combine to form ozone in the atmosphere. Nitrogen oxides are released during the combustion of fossil fuels.

VIII. ENVIRONMENTAL CONSEQUENCES

A. Dredging Site

1. Physical Effects

The dredging project would deepen portions of the natural channel and replace approximately 0.7 acres of intertidal habitat in the upstream portion of the channel with subtidal area. This would not have any significant effect on the flushing characteristics or current patterns in the harbor.

The amount of turbidity generated during dredging operations depends on the sediment characteristics, ambient currents and the skill of the dredge operators. A mechanical dredge typically releases approximately 1.5 to 3% of the sediment volume in each bucket-load, producing suspended solid concentrations on the order of 100 to 900 mg/1 in the immediate vicinity of the dredge, declining rapidly with distance from the dredge (Bohlen et al. 1979, WES, 1988). Increases to turbidity levels in the project area are anticipated as the material to be dredged is mostly fine grained. However, elevated turbidity levels are expected to be short term and localized in the vicinity of the dredge plant.

Removal of ledge from the 8-foot channel would require drilling and blasting with dynamite. Explosives placed in rock or clay substrate produce low-level over-pressures with subsequent reduced lateral or vertical pressure changes. These pressure changes can result in fish kills (See Biological Effects).

2. Chemical Effects

In general, minimal impacts to the chemical environment of the project area are expected. Using the State of Maine's dredge material classification standards from a chemical standpoint, the material to be dredged from Bass Harbor is considered Class I material, or material that is low in concentrations of contaminants of concern. Areas with high concentrations of PCBs exist within the harbor. However, these areas will not be dredged or disturbed during construction of this project.

Elutriate testing was preformed to approximate the release of chemical contaminants during dredging activities. Elutriate testing results from 1985 and 1987 (Appendix C) indicated the potential for slight release of copper, mercury, cadmium and arsenic during dredging operations. None of the sediments tested showed the potential to release PCBs. Therefore, no more than minimal changes in the chemical environment of the project area are expected as a result of this project.

Based on the results of the bulk chemistry tests results, the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency have determined that the material (58,000 cy) from the Bass Harbor Federal navigation project and navigation improvement project is suitable for unconfined open water disposal. This suitability determination has been confirmed by an interagency coordination memo dated July 18, 2003 (see Appendix C).

3. Biological Effects

Dredging in the channel and anchorage areas would result in temporary impacts to the subtidal benthic community. Any non-motile organisms in the active dredging area will likely be destroyed by the dredging activity. However, recolonization of the area following the cessation of dredging activities will occur.

Dredging in the upper anchorage areas would displace some intertidal habitat. Approximately 0.7 acres of intertidal habitat would be permanently converted to subtidal habitat. Community structure in the new subtidal habitat would be similar to that in the other anchorage subtidal areas (see Appendix B for existing subtidal benthic community). Preliminary investigations have determined an insignificant shellfish habitat exists in the proposed dredging area. Dredging of the intertidal area would result in destruction of mussel beds and clam habitat. This loss is unavoidable given the anchorage size requirements. Mitigation is being proposed for the loss of productive intertidal habitat and loss of fish and bird forage area (See Section IX – Mitigation).

The blasting required for rock removal in the channel has the potential to destroy some fish and benthic organisms. Fish possessing air or swim bladders are particularly vulnerable to blasting impacts. The rapid pressure changes associated with the blasting often causes air bladders to rupture. Fish mortality is generally restricted to a few hundred feet of the blast site. Any benthic organisms in adjacent areas affected by blasting would recolonize the area. Blasting activities may also disturb any marine mammals that may be present in the dredging area. It is anticipated that the underwater drilling activities (drilling holes for charges) that precede the blasting event will scare away portions of any fish or mammal populations that may be in the area. A construction window of October 1 through April 30 will be used to minimize impacts to biological resources.

4. Threatened and Endangered Species

Dredging activities are not likely to impact threatened or endangered species. Based on the information currently available to U.S. Fish and Wildlife Service, no Federally-listed species under the jurisdiction of the Service are known to occur in the project area, with the exception of an occasional, transient bald eagles. Trained marine mammal observers may be present during blasting events to ensure that no marine mammals are in the immediate blasting area.

5. Essential Fish Habitat

Potential impacts to essential fish habitat from the dredging, blasting, and disposal activities associated with this project include temporary increases in turbidity from dredging activities, potential burial of demersal organisms during disposal, fish mortality from pressure waves, and the temporary loss of benthic organisms associated with the dredged material and disposal areas. The impacts from the dredging process (turbidity and loss of benthos) are expected to be short-term and localized as the dredging and disposal events will be intermittent and benthic recolonization is generally a rapid process. A construction window of October 1 through April 15 will be used and will reduce impacts to EFH for managed species in the area. Blasting effects are also expected to be minimal as pre-blasting drilling activities are anticipated to scare away portions of the fish populations in the area.

EFH for juvenile and adult Atlantic salmon is designated in the project areas. Salmon are generally found in estuarine areas during their migrations to and from upstream freshwater natal

and spawning habitats. Blue Hill Bay and the areas south of Bass Harbor are listed in NMFS source documents (NMFS, 2001) as aquatic habitat that is historically or currently habitat for juvenile and adult salmon. Disposal of the material at the Eastern Passage Disposal Area will result in localized short-term increases in turbidity, however highly mobile juvenile and adult salmon will be able to avoid these areas. A disposal window of November 1 through April 15 will be used. Therefore, no more than minimal effects on Atlantic salmon EFH are expected.

EFH for all life stages of Atlantic cod (*Gadus morhua*) is designated within the project areas. Atlantic cod eggs are generally found in offshore surface waters with surface temperatures below 12^{o}C, waters depths of less than 100 meters (328 feet), and salinities ranging from 32-33 ppt. Larval cod are generally found in waters of depths of 30 to 70 meters (98 to 230 feet) in salinities of 32-33 ppt. Juvenile cod are also found in high salinity waters and are generally associated with gravel and cobble bottom habitats in water ranging from 25 to 75 meters (82 to 246 feet) in depths. Adult cod are found over a wide range of oceanic salinities in waters ranging from 10 to 150 meters (32 to 492 feet). Eggs, larvae, and juveniles should not be affected by the dredging activities because they generally occur offshore in deeper waters. Minimal impacts to eggs and larvae may occur as a result of the short term increase in turbidity at the disposal site. Juvenile and adult cod are highly mobile and should be able to avoid any areas of increased turbidity. Therefore, no more than minimal impacts to cod EFH are expected as a result of the dredging or disposal activities associated with this project.

EFH for juvenile pollock (*Pollachius virens*) is designated in the project areas. Juvenile pollock are typically found over bottom habitats with aquatic vegetation, sand, mud, or rocks in waters ranging from depths of <1 to 150 meters (3 to 492 feet). Salinity preference for juveniles ranges from 29 to 32 ppt. Juvenile pollock are mobile species that should be able to avoid construction activities and the temporary increases in turbidity associated with the project's dredging and disposal activities. Therefore, no more than minimal impacts to pollock EFH are anticipated.

EFH for juvenile and adult whiting (*Merluccius bilinearis*) is designated in the project areas. Whiting are found over bottom habitats of all substrate types. Generally whiting prefer depths of 20 to 270 meters (66 to 885 feet) with salinities greater than 20 ppt. Whiting are mobile species that should be able to avoid construction activities and the temporary increases in turbidity associated with the project's dredging and disposal activities. Therefore, no more than minimal impacts to whiting EFH are anticipated.

EFH is designated within the project area for red hake (*Urophycis chuss*) juveniles and adults. Juvenile red hake are most often observed in low temperature (<16^{o}), high salinity waters (31-33 ppt), while adult red hake are generally observed in waters between 10 and 130 meters (32 to 426 feet) deep. No impacts to red hake EFH are expected from the dredging portion of this project as hake are mobile and can avoid areas of construction. Additionally, only minimal impacts to EFH in the offshore disposal area are anticipated because red hake are a mobile species that should be able to avoid areas with short term turbidity increases. Therefore, no more than minimal impacts to red hake EFH are anticipated.

EFH is designated for all life stages of white hake *(Urophycis tenuis)* in the project area. The eggs and larvae of white hake are generally found off shore in ocean surface waters while juvenile and adult hake can be found in waters ranging from 5 to 300 meters over all types of substrates. No impacts to white hake EFH are expected from the dredging portion of this project as hake are mobile and can avoid areas of construction. Additionally, only minimal impacts to EFH in the disposal area are anticipated because hake are a mobile species that should be able to avoid areas with short term turbidity increases. Therefore, no more than minimal impacts to white hake EFH are anticipated.

EFH is designated within the project area for all life stages of the winter flounder (*Pseudopleuronectes americanus*). The eggs of winter flounder, which are demersal, are typically found at depths of less than 5 meters (16 feet) in bottom waters in a broad range of salinities (10-30 ppt). Spawning, and therefore the presence of eggs, occurs from February to June. EFH for larvae, juveniles, and adults includes bottom habitats of mud and fine-grained sandy substrate in waters ranging from 0.1 to 100 meters in depth. Spawning adults are typically associated with similar substrates in less than 6 meters (19 feet) of water. Although winter flounder EFH is located within the project area, juveniles and adults are very mobile and would be able to flee from the construction area once activities commence. Flounder adults and juveniles will have the opportunity to avoid any potential impact. Minimal amounts of eggs and larvae may be affected by sediment removal and the associated turbidity during construction activities. However, any impacts that occur will be localized and short term. Disposal activities have the potential to bury adult flounder. However, since the disposal area is greater than 300 feet deep, it is unlikely that adult flounder will in the area. Therefore, no more than minimal impacts on all life stages of the winter flounder EFH are anticipated as a result of this project.

EFH is designated within the project areas for eggs, larvae and adult yellowtail flounder (*Pleuronectes ferruginea*). Eggs and larvae are generally found offshore from March through July in surface waters with salinities between 32-33 ppt and temperature below 17 ^{o}C. Adult yellowtail flounder are usually found in bottom habitats over sand and mud in water depths of 20 to 50 meters in similar salinities and temperatures. The impacts to yellowtail EFH are expected to be minimal. Dredging is not anticipated to have impacts on EFH. Impacts associated with the disposal will be minimal as no disposal will occur during the summer months that correspond to the peak spawning seasons. Additionally, water depths at the disposal site are over 300 feet. Therefore, no more than minimal impacts to yellowtail flounder EFH are expected.

EFH is designated within the project area for all life stages of the windowpane flounder. Eggs are buoyant and typically found in the water column in water depths of 1 meter to 70 meters. Larvae are found in pelagic waters. Juveniles and adults prefer bottom habitats of mud or fine-grained sand and can be found in salinities ranging from 5.5 ppt to 36 ppt. Seasonal occurrences in the project area are generally from February to November, with peaks in occurring May and October. Although EFH for the windowpane is within the project area, this species is broadly distributed in north and mid-Atlantic waters from the Gulf of Maine to Cape Hatteras. Any disruption of EFH will be associated with the construction activities and therefore will not be long-term. As was the case with the winter flounder, windowpane flounder adults

and juveniles should be able to avoid any potential impacts because of their mobility. Eggs and larvae will only have the potential to be impacted by localized, short-term turbidity associated with the construction activities. Therefore, no more than minimal impact on all life stages of windowpane flounder EFH is anticipated as a result of this project.

EFH is designated within the project areas for all life stages of American plaice *(Hippoglossoides platessoides*). Eggs and larvae of plaice are generally found in offshore surface waters in a wide range of salinities. Peaks of eggs and larvae occur in April and May. Juveniles and adults are generally found in offshore water of 45 to 175 meters in depth over bottom habitats of all substrate types in a wide range of salinities. The impacts to American plaice EFH are expected to be minimal. Dredging is not anticipated to have impacts on EFH. Impacts associated with the disposal will be minimal as they will be limited to temporary increases in turbidity. Therefore, no more than minimal impacts to American plaice EFH are expected.

EFH is designated within the project areas for all life stages of ocean pout (*Macrozoacres americanus*). Ocean pout spawning occurs from late summer through early winter with peak spawning occurring during September and October. Eggs of the ocean pout are generally laid in gelatinous masses on complex hard bottom habitat where they are guarded by adult pout. The physical conditions in which these eggs are typically found include: water temperatures below 10 ^{o}C, depths less than 50 meters, and salinities ranging from 32 to 34 ppt. Larvae are relatively advanced in development and remain in close proximity to the nesting area after hatching. Juvenile ocean pout inhabit smooth bottom habitats near rocks and structure in waters less than 80 meters in depth and salinities greater than 25 ppt. Adults inhabit similar habitat. Dredging should have minimal impacts on ocean pout EFH because the channel and anchorage expansion areas are not located in close proximity to rocky areas preferred by the pout. No impacts are anticipated at the disposal area due to the depth of the site. Therefore, no more than minimal impacts to ocean pout EFH are expected.

EFH is designated within the project areas for all life stages of Atlantic sea scallop (*Placopecten magellanicus*). Scallop spawning occurs between May and October with peaks in May and June. Eggs are demersal and remain on the seafloor until free-swimming larvae hatch. Larvae tend to be found in pelagic waters and bottom habitats with substrates of gravelly sand, shell hash, or various macroalgae. Juvenile and adult sea scallops are found in water depths of 18 to 110 meters in salinities above 16 ppt. No more than minimal impacts to Atlantic sea scallop EFH are expected as a result of this project as most of the construction and disposal activities (which will occur from November 1 through April 15) will avoid peak spawning and early life stage times.

EFH is designated within the project area for Atlantic sea herring (*Clupea harengus*) larvae, juveniles, and adults. Larvae, juvenile and adults typically prefer depths of 15 to 130 meters. Larvae are observed in pelagic waters between August and April (with peaks from September through November) in waters with salinities near 32 ppt and temperatures below 16 ^{o}C. Juveniles and adults can be found in pelagic waters and over bottom habitats with

temperatures below 10 ^{o}C and in salinities above 28 ppt. No more than minimal impact is expected to occur to Atlantic sea herring EFH. Larval sea herring may experience some impacts from the short term increase in turbidity at the offshore disposal site, while adult and juvenile sea herring should be able to avoid any potential impacts. No more than minimal impacts to EFH are expected from the dredging and open water disposal activities.

EFH is designated within the project area for adult and juvenile Atlantic mackerel (*Scomber scombrus*). No more than minimal impact on Atlantic mackerel EFH is anticipated as a result of the proposed project as Atlantic mackerel juveniles and adults are very mobile and should be able to avoid the construction and disposal areas with temporary increases in turbidity.

EFH is designated within the project area for adult Atlantic bluefin tuna (*Thunnus thynnus*). No impacts to tuna EFH are expected from the dredging activities and no more than minimal impacts are expected from the offshore disposal activities. Bluefin tuna are high mobile and should be able to avoid the short term increases in turbidity associated with dredged material disposal.

6. Historic and Archaeological Resources

There is one known shipwreck within the proposed project area. In addition, the harbor may have prehistoric site potential. Therefore, if this project proceeds to a further stage of planning and design, then additional research would need to be performed in this area and a remote sensing survey should be completed to investigate the possibility for intact submerged land surfaces, as well as the presence of shipwrecks. If the remote sensing survey illustrates the presence of intact land surfaces as well as anomalies indicating the possible presence of shipwrecks, then an archaeological survey may be required during later study stages. The Maine Historic Preservation Commission, in a letter, dated October 20, 2003, has concurred with this finding. No response was received from the five, Federally recognized tribes in Maine. The Maine HPC also agreed in their letter that no further studies of submerged prehistoric archaeology were necessary.

7. Social and Economic Effects

The project would reduce damages and congestion related delays associated with overcrowding of the anchorages. Economic benefits are derived from savings associated with navigation improvements. The anchorage and channel would provide $230,500 worth of annual benefits. An anchorage alone would provide $144,600 in annual benefits. The channel alone would provide $94,200 in annual benefits. Annual net benefits reflect the annual benefits after taking the annual cost of construction into account. The anchorage and channel plan provide the greatest net annual benefits at $115,400 for the commercial fleet alone. The Economics Appendix to the Feasibility Report, Appendix F, details the evaluation of the economic benefits of the project.

8. Air Quality Statement of Conformity

The improvement dredging of Bass Harbor is subject to Clean Air Act requirements. An air quality conformity analysis (Appendix G) was completed to demonstrate compliance. The conformity analysis details projected emissions that would result from the construction of the proposed project. These data are then compared to Federal and State air quality standards to determine impacts to air quality.

The project would have no long-term impacts on air quality. 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 (Appendix G). This project therefore conforms to the Federal requirements for activities under the Clean Air Act within the Maine State Implementation Plan.

B. Disposal Sites

1. Physical Effects

Most of the dredged material disposed of from a barge falls rapidly under the influence of gravity as a concentrated cloud of material. During this descent water is entrained with the disposal cloud resulting in a gradual decrease in the density of the discharged material. The entrainment of water during the descent and the residual dispersal of sediment washing out of the disposal vessel will result in some portion of the dredged material remaining in suspension throughout the water column. The amount of material dispersed in the water column is small compared to that reaching the bottom. Several investigators, Bokuniewwicz (1978), Johnson (1978), Morton (1983) and Tavolaro (1982) have all estimated that only 3 to 5% of the dredged material remains in suspension.

Upon impacting the bottom the vertical momentum present during the descent is transferred to horizontal spreading of the material and a mound of material is created. The exact shape and size of the mound would be modified by currents and the local topography. Once on the bottom ambient currents and turbulence determine the transport and spread of material. Since the disposal areas are located in depositional areas with fine sediments, the placement of dredge material at these sites should not significantly alter the substrate type.

2. Chemical Effects

The dredged sediments consist of uncontaminated material and are suitable for ocean disposal (see Appendix D – Suitability Determination). Elutriate testing indicated a potential for minor and insignificant releases of mercury, cadmium, and arsenic. Dilution within the water column at any of the alternative disposal sites would quickly dilute the concentrations to background levels. Therefore, no significant chemical effects to the water columns or sediments at the alternative disposal sites are anticipated.

3. Biological Effects

Suspended solids concentrations on the order of 200 - 1000 mg/1 can be expected in the immediate vicinity of the disposal event (Wright, 1978). Short term (2 - 4 hours) increases of suspended solids (50 mg/1) can be expected to occur in the area surrounding the barges following a disposal event. Planktonic organisms (phytoplankton, zooplankton, meroplankton, fish larvae) underneath the barge during disposal event would be entrained in the descending mass of water and dredged material. The effect of minor short-term increases in suspended solids load on phytoplankton populations and primary productivity in the waters surrounding Mount Desert Island is anticipated to be insignificant.

Mobile fish species would generally avoid the area and are not expected to be impacted by disposal activities. Short-term exposure to suspended sediment concentrations are likely to cause little direct mortality to fish eggs or larvae as laboratory studies generally indicate that adults and juveniles of anadromous and coastal species are tolerant of exposure to high concentrations of suspended sediments (Stern and Stickle, 1978; Peddicord and McFarland, 1978; Wakemann et al. 1975). Demersal fish generally tend to be more tolerant to suspended solids concentrations. Mortality is related to clogging of gills and subsequent respiratory failure, and has generally only been noted after prolonged exposure to high concentrations (i.e. > 500 mg/1). Disposal of dredged material at the Eastern Passage Harbor Disposal Site in not expected to have significant impact on the finfish resources of coastal Maine.

The physical impacts of dredged material disposal to benthic communities have been well studied (Diaz and Boesch, 1977; McCall, 1977; Wright, 1978). Burial during disposal would result in direct mortality of organisms at the disposal site. Organisms in the immediate vicinity of the disposal-mound would be impacted by the fluid mud which spreads out when the material impacts the bottom. Initial recolonization by opportunistic polychaete species would occur within a matter of weeks. These species, which are capable of rapid population increases, rework the sediments through their feeding and burrowing activities. This biological mixing of the sediments homogenizes and aerates the upper few centimeters of the sediment, making the area more favorable for later successional stages to colonize. The number and density of benthic organisms can be expected to return to background levels within three months. Community structure can be expected to return to background within a 1 to 2 year period following disposal.

Local interests have expressed concern over the potential impacts to lobster and scallop resources in the area. Marine crustaceans and molluscs are generally tolerant of exposure to high concentrations of suspended sediments for prolonged periods (Saila et al., 1972; Stern and Stickle, 1978). Short-term exposure to elevated suspended sediment concentrations at the Eastern Passage Disposal Site would therefore result in little mortality of adult crabs, lobsters or molluscs. Burial, however, could result in direct mortality of lobsters and scallops, which may be present near the disposal site. No resource information is available on the scallop or lobster abundances. However, given the depth of the disposal area (300+ feet) it is anticipated that no significant impacts to these resources will be incurred.

4. Threatened and Endangered Species

Coordination with NMFS and USFWS has determined that humpback whales, fin whales, right whales, and harbor seals are not likely to be adversely impacted by disposal activities. Although these species may occur in the area, marine mammal observers will be required to be present during disposal events to avoid impacts. Therefore, no significant impacts will occur to threatened or endangered species in the area.

5. Essential Fish Habitat

Section VIII.A.5 details effects to EFH for both the dredging area as well as the alternative disposal areas.

6. Historic and Archaeological Resources

The proposed disposal sites have little archaeological potential. Therefore, disposal of dredged materials at either the alternative disposal areas should 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. The Maine State Historic Preservation Officer in a letter, dated October 20, 2003 has concurred with this determination. Correspondence was sent to the five, Federally recognized Native American tribes in Maine, but no response was received.

7. Social and Economic Resources

Fishing only occurs around the outer rim of the Eastern Passage Disposal Site. Therefore, no social or economic resources are anticipated to be affected by this project.

IX. MITIGATION

Intertidal mudflats are valued ecologically as highly productive habitat. However, sampling of the biological resources in the intertidal areas proposed for removal revealed that they were not significantly different than those resources found in subtidal areas of the project. Species diversity and richness varied within similar ranges for both the intertidal and subtidal areas. The communities in both habitats were dominated by subsurface deposit feeding organisms. Therefore, the conversion of intertidal areas to subtidal will not significantly alter functions within the ecosystem. The Corps opinion is that mitigation for the proposed loss of intertidal flats is not warranted.

Although the Corps' opinion is that mitigation is not necessary for this proposed project, Federal and State resource agencies recommend compensation for the loss of the approximately 0.9 acres of intertidal habitat. Several mitigation options have been evaluated for this project. Initially, a plan was developed by the Corps to construct intertidal mudflats to mitigate for the loss of existing flats (Corps, 1991). This option was deemed unsuitable by State and Federal regulatory agencies as it was stated that the creation of intertidal mudflats would alter water

quality in the area significantly and would not fully compensate for the loss of intertidal flat. A second mitigation plan to attempt to introduce submerged aquatic vegetation (i.e., eelgrass) was also proposed. However, since there were no historic accounts of eelgrass in the harbor, this plan was not pursued.

Currently, the local sponsor and the State of Maine Department of Environmental Protection are developing a conservation plan to serve as mitigation for the loss of intertidal flat associated with this project. The town of Tremont, ME is currently negotiating a plan to permanently designated upland/shoreline areas as a conservation/wildlife refuges. The plan includes several acres of shore front properties along Seal Cove and Sawyer Island, a 1.5 acre undeveloped island located within Bass Harbor (See Figure 6).

X. CUMULATIVE EFFECTS

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 Bass Harbor include the maintenance dredging of the entrance channel and anchorage areas and navigation through the channel. Past and current activities at the disposal site include navigation and limited commercial fishing. The proposed improvements and disposal activities would not result in any expansion of either the commercial or recreational fleets at Bass Harbor. Reasonably foreseeable future actions include the continuation of current maintenance and navigation activities. Besides the Federal maintenance and improvement project, there is only one currently proposed dredging activity, the maintenance dredging of berths and access at the Thurstons Lobster Wharf. Therefore, no adverse cumulative impacts are projected as a result of this project.

XI. OTHER CONSIDERATIONS

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 project is not located near any areas with these populations.

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 access to the project area during construction will be limited as it will be occurring in the harbor and therefore should not pose a risk to children.

Figure 6 Sawyer Island

XII. ACTIONS TO MINIMIZE IMPACTS

The following actions have been proposed to minimize potential adverse impacts associated with this project.

1. The dredging contractor will be required to accommodate vessel traffic during dredging operations.

2. Before any construction activities begin, the disposal area will be clearly delineated to assure proper placement.

3. Contractors will be responsible for complying with any special conditions and/or stipulations incorporated into the appropriate Federal and state regulatory approvals.

4. Mobilization and blasting activities will be limited to a period between October 1 and April 15. Dredging and disposal activities will be limited to a period between November 1 and April 15 to avoid impacts to biological resources (fisheries/shellfish).

5. A 1.7-acre island (Sawyer Island) and its surrounding intertidal flats will be permanently designated as a conservation/wildlife refuge to mitigate for the loss of 0.7 acres of intertidal flat.

XIII. COORDINATION

Coordination has been conducted with the appropriate state and Federal agencies. Copies of the public notice and coordination letters received are contained in Appendix A. Coordination has occurred with the following agencies and officials:

US Environmental Protection Agency
United States Coast Guard
Maine Department of Environmental Protection
Maine State Historic Preservation Commission
Town of Bass Harbor Town Manager
Town of Bass Harbor Harbor Master
US Fish and Wildlife Service
National Marine Fisheries Services
Maine Office of State Planning
Maine Department of Marine Resources
Town of Bass Harbor Board of Selectmen

XIV. COMPLIANCE WITH ENVIRONMENTAL FEDERAL STATUTES AND EXECUTIVE ORDERS

Federal Statutes

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

Compliance: Issuance of a permit from the Federal land manager to excavate or remove archaeological resources located on public or Indian lands signifies compliance. Not applicable.

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

Compliance: Project has been coordinated with the State Historic Preservation officer. A survey of the proposed area to be dredged may be required. Any impacts to archaeological resources will be mitigated.

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

Compliance: Must ensure access by native Americans to sacred sites, possession of sacred objects, and the freedom to worship through ceremonials and traditional rites. This act is not applicable as there were no sites identified in the project area.

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

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

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

Compliance: A Section 404(b)(1) Evaluation and Compliance Review has been incorporated into the project report. An application shall be filed for State Water Quality Certification pursuant to Section 401 of the Clean Water Act.

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

Compliance: A CZM consistency determination shall be provided to the State for review and concurrence that the proposed project is consistent with the approved State CZM program.

7. 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) has been completed pursuant to Section 7 of the Endangered Species Act.

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

Compliance: Not applicable. Applicable only if report is being submitted to Congress.

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

Compliance: Public notice of availability to the project 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.

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

Compliance: Coordination with the FWS, NMFS, and State fish and wildlife agencies signifies compliance with the Fish and Wildlife Coordination Act.

11. 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.

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

Compliance: Not applicable as the project does not involve the transportation or disposal of dredged material in ocean waters pursuant to Sections 102 and 103 of the Act, respectively.

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

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

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

Compliance: Regulations implementing NAGPRA will be followed if discovery of human remains and/or funerary items occur during implementation of this project.

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

Compliance: Preparation of an Environmental Assessment signifies partial compliance with NEPA. Full compliance shall be noted at the time the Finding of No Significant Impact or Record of Decision is issued.

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

Compliance: No requirements for projects or programs authorized by Congress.

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

Compliance: Floodplain impacts have been considered in project planning.

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

Compliance: Coordination with the Department of the Interior to determine project impacts on designated Wild and Scenic Rivers has occurred. This project is not located in an area of concern.

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.

Executive Orders

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

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

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

Compliance: Public notice of the availability of this report or public review fulfills the requirements of Executive Order 11988, Section 2(a) (2).

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

Compliance: Public notice of the availability of this report for public review fulfills the requirements of Executive Order 11990, Section 2 (b).

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

Compliance: Not applicable to projects located within the United States.

5. 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 population, or any other population in the United States.

6. Executive 13007, Accommodation of Sacred Sites, 24 May 1996

Compliance: Not applicable as this project does not occur on Federal lands.

7. Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. 21 April, 1997.

Compliance: The project would not create a disproportionate environmental health or safety risk for children.

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 signifies compliance. Consultation with tribes in the project area was done. Therefore, this project complies with this Executive 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 as the project consists of dredging and disposal of dredged material in open water.

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. Consultation with tribes in the project area was done. Therefore this project complies with this Executive Memorandum.

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