# APPENDIX A

# SECTION 404(b)(1) EVALUATION

## TYBEE ISLAND, GEORGIA
## SHORELINE PROTECTION PROJECT
## 2019 HURRICAN HARVEY, IRMA, MARIA
## EMERGENCY SUPPLEMENTAL RENOURISHMENT

**U.S. ARMY CORPS OF ENGINEERS**
**SAVANNAH DISTRICT**

**APRIL 2019**

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# SECTION 404(b)(1) EVALUATION OF DREDGE AND FILL MATERIAL

**Tybee Island Shore Protection Project, Georgia 2019 Hurricane Harvey, Irma, Maria, Emergency Supplemental Renourishment**

## 1.0 INTRODUCTION

The following evaluation is prepared in accordance with Section 404(b)(1) of the Clean Water Act of 1977 (CWA) to evaluate the environmental effects of the proposed placement of dredged or fill material in Waters of the United States. Toxic and hazardous waste pertaining to fill or dredge activities are also regulated under the CWA. Specific portions of the regulations are cited and an explanation of the regulation is given as it pertains to the project. These guidelines can be found in Title 40, Part 230 of the Code of Federal Regulations.

Tybee Island is located 17 miles east of Savannah at the mouth of the Savannah River on the Atlantic Ocean (Figure 1). Tybee Island is Georgia's most densely developed barrier island, bordered on the north by the South Channel of the Savannah River, on the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. Tybee Island has an average width of 0.5 miles and the ground elevation varies from 10 to 18 feet above Mean Lower Low Water (MLLW) and slopes westward to the salt marshes.

Project elevations for design and construction are established from NOAA tide gage Station 8670870 at Fort Pulaski, GA and based on MLLW in accordance with ER 110-2-8160 and EM 110-2-6056. Conversion from MLLW to NAVD88 at Station 9670870: +0' MLLW = +4.05' NAVD88.

## 2.0 PROPOSED ACTION AND ENVIRONMENTAL SETTING

### 2.1 PROPOSED ACTION

Information on the authorized project can be found in the EA in section 1.1. As proposed, the project will be constructed using a hydraulic cutterhead pipeline dredge and support equipment. A submerged pipeline will extend from the borrow site to the southerly tip of Tybee Island. Shore pipe will be progressively added to perform fill placement along the shorefront or creek front areas to be renourished. Temporary toe dikes will be utilized in a shore parallel direction to control the hydraulic effluent and reduce turbidity. The sand will be placed in the form of varying design templates based upon longshore volumetric fill requirements which reflect beach conditions at the time of construction. Additional beach fill will be strategically placed in areas of documented highest erosional stress such as the 2nd Street "hot spot" (Figure 2). Existing dunes are minimal in the hot spot areas.


Figure 1: Tybee Island Shore Protection Map Location


Figure 2: Tybee Island Erosion Hotspots

The proposed offshore borrow site is an expansion of a presently defined and permitted area utilized for the construction of the 1994 Georgia Port Authority (GPA) South Beach project and the Savannah District 2000, 2008, 2015 and 2018 renourishments (Figure 3). The original borrow area is located approximately 4,000 feet southeast of the southernmost Federal terminal groin. Figure 3 shows the location of the borrow area with the borrow area extension. The Northwest facing side of the 2019 borrow location extension is ~3,090 ft (long edge toward Tybee). The Northeast facing side of the 2019 borrow location extension is ~6,800 ft (long edge facing the Savannah River navigation channel). The East facing side of the 2019 borrow location extension is ~7,160 ft (long edge facing the ocean.) The total area of the 2019 proposed borrow area extension is ~625 acres. Total area of the 2015 borrow area was ~213 acres. Total area of the 2008 borrow locations was ~256 acres. Total of yellow "original borrow area limits" was ~290 acres. The total area of the whole borrow area, including the extension, is ~1,340 acres.

The borrow site limits have been extended, principally in a northerly direction, since the volume of sand remaining within the previously permitted area was deemed insufficient to construct the 2019 HIM Supplemental renourishment project in its entirety. Extension of the borrow site in a northward direction was selected to avoid potential impacts to Little Tybee Island CBRA Unit No.1 to the south. Additionally, expansion of the borrow site to the east was not pursued due to the silty nature of the material to the east (i.e. seaward) of the previously authorized borrow site.

In order to support the expansion of the previously defined borrow site, geotechnical, environmental and cultural resources investigations were conducted for the proposed borrow site expansion. An updated hydrographic survey data for the borrow site was performed in August 2018.

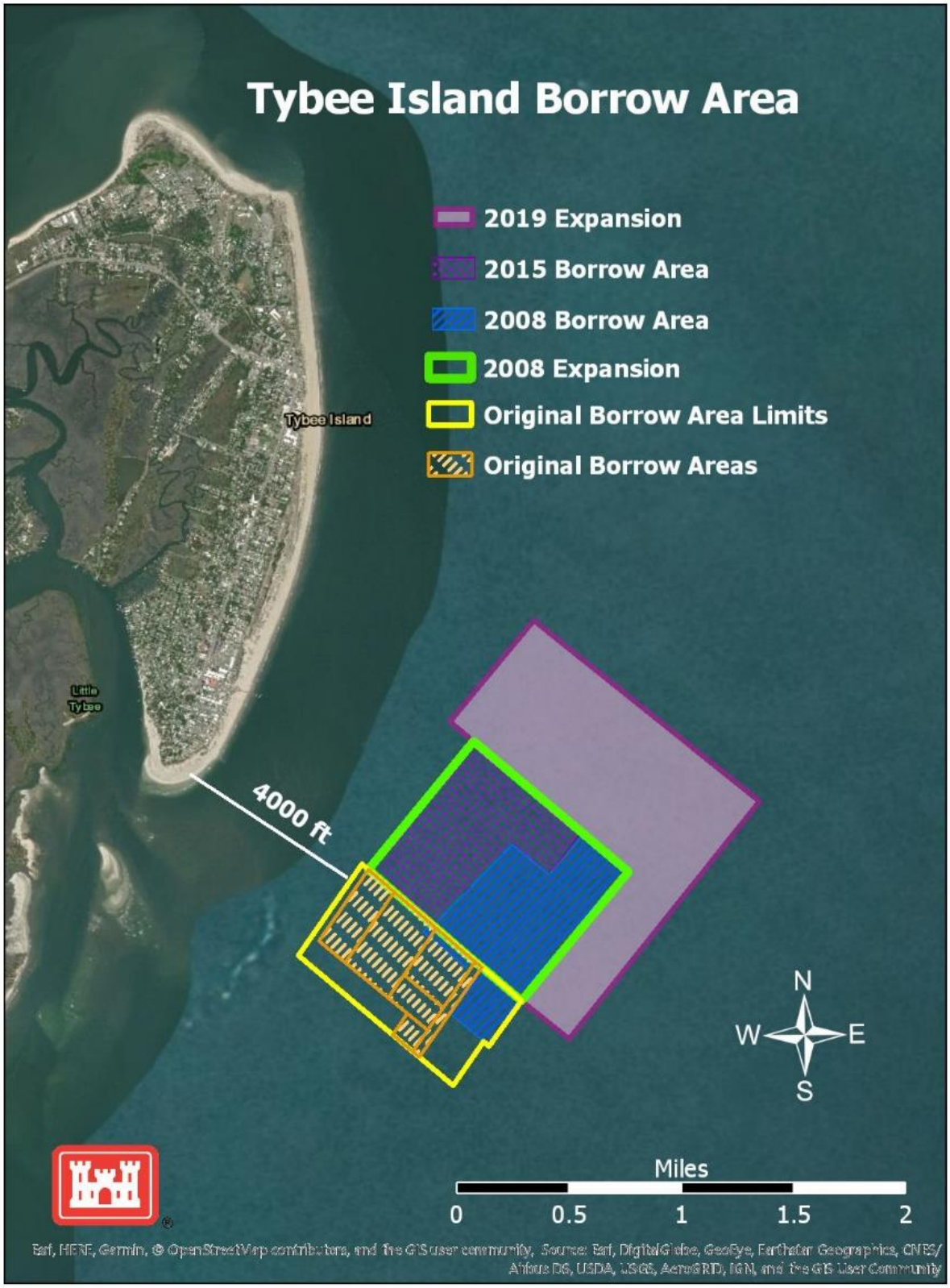


Figure 3: Tybee Island borrow area history and planned expansion.

The proposed project template design is based on project performance and erosion rates since the last renourishment project in 2018, the calculated storm damage, and the proposed dune construction sites. Areas include the North Beach (North End Groin to Oceanview Court), Second Street area (Oceanview Court to Center Street), Middle Beach (Center Street to 11th Street), South Beach (11th Street to South End Groin), and the South Tip Groin Field. Additional fill will be placed between these areas to provide a more stable beach profile and to avoid some of the excessive losses in the 2nd Street "hot spot" from project end losses and offshore losses that resulted from the wide beach constructed at this location during the last renourishment. Beach widths on the Oceanfront Beach will vary from a 25-foot width berm, to a berm approximately 350 feet wide at the elevation of +11.2 MLLW. Based on natural angle of repose on the existing beach, and experience with previous placement, a beach slope of 1 vertical on 25 horizontal will be required on the oceanfront beach (Figure 4).

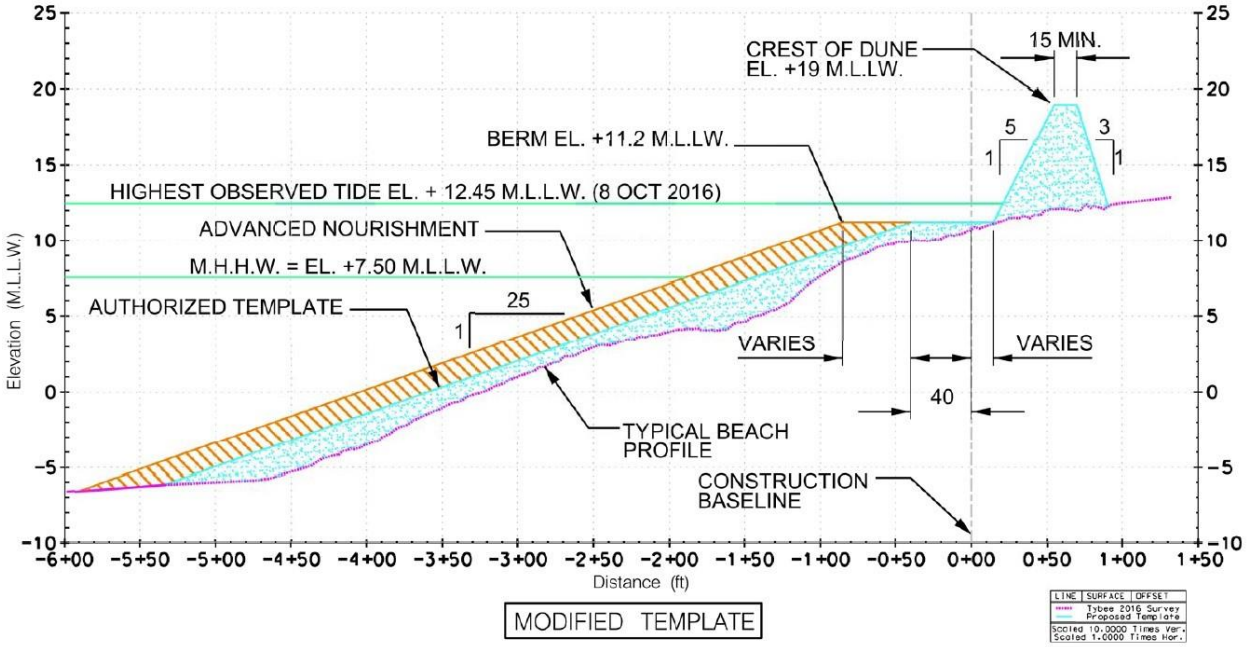


Figure 4: Tybee Island Modified Template.

Incorporation of existing dunes within the federal project will include approximately 9,500 linear feet of existing dunes meeting the requirements of the modified template along the Front Beach renourishment area. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. Existing dunes in the federal project are shown in Figure 5 in orange.

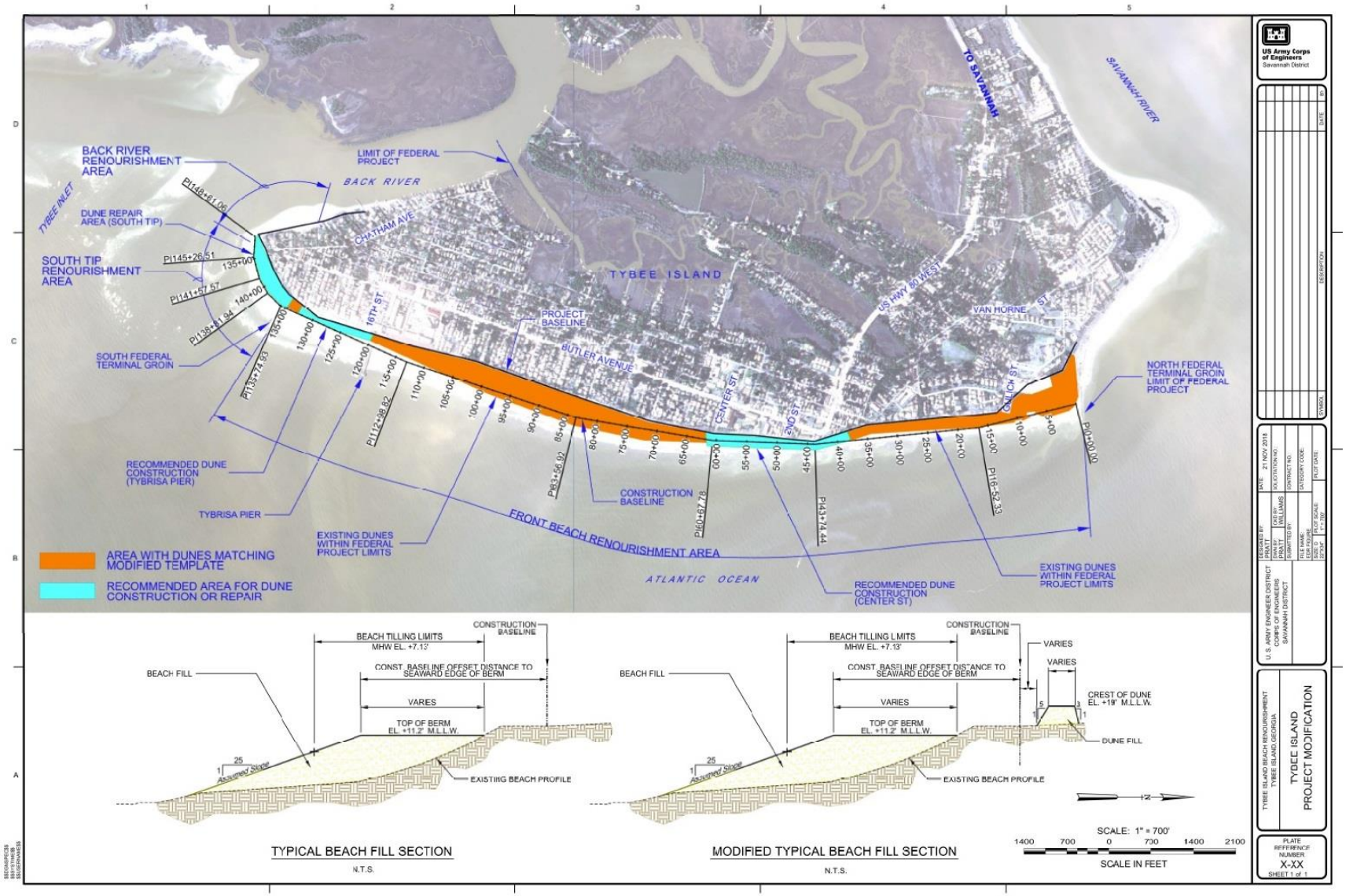


Figure 5: Tybee Island Project description. Existing dunes within the federal project are shown in orange. Recommended dune construction areas are shown in blue.

Recommended dune construction within the federal project includes 3,700 linear feet of the Front Beach renourishment area addressing erosion hot spots (Figure 5; blue shaded area). In addition, approximately 1,100 linear feet along the South Tip renourishment area would be considered for dune construction in order to rebuild dunes to meet the requirements of the recommended template. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. The recommend dune portion of the template will use a 1:5 slope on the seaward side of the dune and a 1:3 slope on the landward side of the dune based off of the field data collected. Dune crest height of +19' MLLW is recommended to protect against storm surge with a one percent exceedance probability while taking into consideration sea level rise. A dune crest width of 15' is recommended allowing for construction of dunes within the federal foot print and maintaining a distance from the edge of the berm that will prevent erosion to the dunes from wave action. Sand fencing could be placed at the seaward and landward toe of the dune to limit pedestrian traffic. Figures 4 and 5 shows the proposed design template.

Beach fill final placement will be based on physical conditions and funds available at the time of construction. The proposed project is expected to commence by November 2019, and be completed by April 30, 2020.

## 2.2 ENVIRONMENTAL SETTING

Tybee Island is one of a series of barrier islands lying along the Atlantic coast from Florida to North Carolina. The island is located directly south of the Savannah River entrance, about 17 miles east of the city of Savannah, Chatham County, Georgia. It is bounded on the north by the Savannah Harbor, to the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. The major portion of the land mass above high tide is occupied by the City of Tybee Island. The City of Tybee Island is the only population center on the island with the major portion of its economy primarily oriented toward support facilities which service summer vacationers.

The study area includes the North Beach, Second Street, Middle Beach, South Beach and Back River.

### 2.2.1 Threatened, Endangered and other Listed Species

The Savannah District has prepared an updated Biological Assessment of Threatened and Endangered Species (see BATES, Appendix B). The 2015 Biological Opinion determined that implementation of this beach restoration may affect piping plover and designated critical habitat unit GA-1. In addition, the Savannah District and resource agencies have determined if the renourishment extends past April 30, loggerhead and leatherback sea turtles are likely to be adversely affected. The Savannah District believes that the project, implemented according to special conditions included in the

BATES and the BO, will not be likely to adversely affect the other listed species in the area, including the Florida manatee, red knot, and shortnose and Atlantic sturgeon.

## 3.0 SUBPART B - COMPLIANCE WITH THE GUIDELINES

The following objectives should be considered in making a determination of any proposed discharge of dredged or fill material into waters of the United States.

### 3.1 RESTRICTIONS ON DISCHARGE

"(a) ***except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted if there is a practical alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences."***

Beach renourishment was the only practicable or feasible alternative identified for shore protection at Tybee Island, Georgia.

Some incidental loss of sediments to the water column will occur during the dredging process and placement of dredged material on the beaches and during construction. Construction losses have been estimated to be 20%. These losses would not result in a violation of state water quality standards.

Impacts at the proposed borrow area and on the beach would include impacts to benthic resources. Based on recommendations during the 2008 renourishment from NMFS a monitoring program of both the fill and borrow area was implemented to document changes relative to control areas and assess long-term recovery. Results of this monitoring may be located in the 2008 EA, sections 4.18.1 and 4.18.2. Consultation occurred 6 November 2018 with USFWS to determine if benthic monitoring is appropriate for this renourishment. Benthic monitoring was deemed unnecessary for this renourishment with the following statement issued from USFWS, “The executive summary from the SCDNR final report for the swash zone on the renourished beach for the last Tybee renourishment states: *The impact and recovery trajectories of benthic macroinfauna in response to the placement of sand on Tybee Island appear to be within the range of similar studies.*” Suspended particulate may be expected to have some adverse impact on filter feeders, but those impacts are expected to be temporary. Where appropriate, construction activities would be timed so that possible turbidity impacts to larval estuarine fish and shellfish would be minimized. To minimize these impacts, the proposed actions in this area would not take place during the critical reproductive season for estuarine fish and shellfish.

"(b) ***Discharge of dredged material shall not be permitted if it;"***

"(l) ***Causes or contributes, after consideration of disposal dilution and dispersions, to violations of any applicable state water quality standard;"***

Turbidity at the site would increase during construction. However, this situation would be temporary and localized. Part of these losses would be from suspended silts and clays that might travel far from the site before settling, while the majority would be from fine sands that settle near but outside the project template. The average percentage of fines from sampling completed at the borrow site (sediment passing the No. 200 sieve) was 3.27%., which is well within the state requirement of less than 10%. As mentioned previously, temporary toe dikes will be utilized in a shore parallel direction to control the hydraulic effluent and reduce turbidity. No State water quality standards are expected to be violated.

"(2) ***Violates any applicable toxic effluent standard or prohibition under Section 370 of the Clean Water Act."***

A Public Notice will be issued on this proposed activity in conjunction with a request to the State of Georgia for issuance of a Section 401 – Water Quality Certification for this project after District and Division reviews. A review of the project specifications indicates that the proposed action is not expected to reduce water quality below applicable standards or violate other prohibitions under Section 307 of the Act. This conclusion is based on the containment testing that occurred November 2018 which showed that the dredged material is not known to contain contaminants at toxic levels.

"(3) ***Jeopardizes the continued existence of species listed as endangered and threatened under the Endangered Species Act of 1973, as amended."***

A separate BATES was prepared and will be coordinated with both the USFWS and the NMFS during public review. The BATES concluded that the proposed project may affect piping plover and designated critical habitat unit GA-1 as well as the red knot. In addition, it was determined that if the renourishment extends past April 30 loggerhead and leatherback sea turtles are likely to be adversely affected. The District feels that the project, with special conditions included in any contract for dredging, will not be likely to adversely affect the other listed species in the area, including the Florida manatee and whales.

"(4) ***Violates any requirements imposed by the Secretary of Commerce to protect any marine sanctuary designated under Title lll of the Marine Protection Research and Sanctuaries Act of 1972."***

No marine sanctuary or other items addressed under this act would be affected by the proposed work.

"(c) ***Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted which will cause or contribute to significant***

***degradation of the waters of the United States. Findings of significant degradation related to the proposed discharge shall be based upon appropriate factual determinations, evaluations, and tests required by Subparts B and G of the consideration of Subparts C-F with special emphasis on the persistence and permanence of the effects contributing to significant degradation considered individually or collectively include:"***

***"(1) Significantly adverse effects of the discharge of pollutants on human health or welfare including, but not limited to effects on municipal water supplies, plankton, fish, shellfish, wildlife, and special aquatic sites."***

Sediment testing was performed on sediments proposed for excavation in this project to assess the potential for contaminant-related environmental impacts from the dredged material. The testing concluded that the sediments proposed for excavation and beach nourishment do not contain contaminants at toxic levels. See the 2019 Environmental Assessment 2.2.6. Therefore, provisions of the above paragraph are not expected to be violated. The placement of dredged material on the beach would have a short-term impact on the turbidity of the receiving waters. This impact is expected to last only for the time of the construction and the discharged sediments would quickly settle out or be swept out of the immediate vicinity via the tidal system.

***"(2) Significantly adverse effects of the discharge of pollutants on life stages of aquatic life and other wildlife dependent upon aquatic ecosystems, Including the transfer, concentration, and spread of pollutants or their by-products outside the disposal site through biological, physical, and chemical processes."***

The sediments to be dredged are not considered to contain pollutants at toxic levels. Therefore, provisions of the above paragraph are not expected to be violated. See the 2019 Environmental Assessment 2.2.6.

***"(3) Significantly adverse effects of the discharge of pollutants on aquatic ecosystems diversity, productivity, and stability. Such effects may include, but are not limited to, loss of fish and wildlife habitat or loss of the capacity of a wetland to assimilate nutrients, purify water, or reduce wave energy; or"***

***"(4) Significantly adverse effects of the discharge of pollutants on recreational, aesthetic, and economic values."***

The proposed activity is not expected to adversely affect ecosystems, diversity, productivity and stability, or recreational, aesthetic, and economic values primarily because it is a shore protection project that would protect property and would enhance the aesthetic and recreational values of the area.

"(d) ***Except as provided under Section 404(b)(2), no discharge of dredged or fill material shall be permitted unless appropriate and practical steps have been taken***

***which will minimize the potential adverse impacts of the discharge on the aquatic ecosystem."***

Construction and future periodic renourishment activities would be targeted to avoid the nesting season for sea turtles (1 May – 30 August) to the maximum extent practicable. Project construction dates are planned for November – April to avoid impacts to larval fish, shellfish and sea turtles to the extent practicable. Additional steps that will be taken to minimize the potential impacts of the project on threatened and endangered species are enumerated in the BATES and in the EA.

## 3.2 FACTUAL DETERMINATION

### 3.2.1 Physical Substrate Determinations

Since the substrate is common to the area and has been disturbed before, the proposed activities are not expected to have an adverse effect on the physical substrate of bottom sediments in the immediate project vicinity. The proposed project would protect the Federal Authorized Template consisting of a 40-foot berm at +11.2 feet MLLW, with a 1V:20H slope.

### 3.2.2 Water Circulation, Fluctuations, and Salinity Determinations

The proposed dredging is not expected to result in any adverse effects on water circulation, fluctuations, salinity or water quality degradation. Excavation of the borrow area is not expected to significantly alter the current patterns at the site. Extension of the borrow site in a northward direction was selected to avoid potential impacts to Little Tybee Island to the south.

### 3.2.3 Suspended Particulate/Turbidity Determinations

#### 3.2.3.1 Effects on Physical Properties of the Water Column

Effects on the water column are primarily those associated with a reduction on light transmission, aesthetic values, and direct destructive effects on nektonic and planktonic populations. The proposed shore protection project would have the following impacts on these factors:

a. **Reduction in light transmission.** Sediment which becomes suspended in the water column as a result of the shore protection project is expected to result in a temporary elevation in suspended solids along the shore until the fines are swept offshore by tidal action. This impact should be temporary in nature as the sediments will quickly settle out or be dispersed.

b. **Aesthetics.** The turbidity produced by operation of the pipeline dredge will result in minor adverse impacts on the aesthetic appeal of

the area. The decrease in aesthetics will be temporary and cease soon after construction is completed.

#### 3.2.3.2 Effects on Biota

There will be a temporary disruption in benthic communities at the borrow site and at the beach areas. The temporary increase in turbidity surrounding the construction site will also have a short-term and minor adverse impact on benthics in the vicinity of the project. No lasting changes in community structure are expected, as the beach areas have already experienced nourishment activities. The proposed project is expected to have little impact on dissolved oxygen because of the rapid aeration in the surf zone.

### 3.2.4 Contamination Determination

The sediments to be excavated have been evaluated. Potentially toxic materials detected in the sediments were found to be below toxic levels (See EA Section 2.2.6). Therefore, the material dredged during this project would impact neither the communities from which it is taken nor communities at the beach project.

### 3.2.5 Aquatic Ecosystem and Organism Determinations

There is expected to be a minor, short-lived impact on organisms associated with the borrow site and the beach areas. These effects would be temporary and no significant impacts are expected.

#### 3.2.5.1 Threatened and Endangered Species

The BATES concluded that the proposed project may affect wintering piping plovers and designated critical habitat unit GA-1. In addition, it was determined that if the renourishment extends past April 30 loggerhead and leatherback sea turtles are likely to be adversely affected. The District feels that the project, with special conditions included in any contract for dredging, will not be likely to adversely affect the other listed species in the area, including the Florida manatee and sturgeon species. While the renourishment actions may result in short-term adverse effects, it is our belief that the piping plover and designated critical habitat areas would ultimately benefit from them.

#### 3.2.5.2 Planktonic and Nektonic Species

Impacts to planktonic and nektonic species would be minor in scope, primarily due to increase in turbidity during the dredging operation and placement of material at the beach areas.

#### 3.2.5.3 Other Wildlife

The proposed project would have minimal impact on other wildlife.

#### 3.2.5.4 Effects on Benthos

There will be a temporary disruption in benthic communities at the borrow site and beach areas where some organisms would be lost by covering. Some organisms which inhabit the beach sites are capable of upward burrowing and lateral migration and results of the benthic monitoring showed evidence of some species survival. These organisms are subject to changes associated with daily and seasonal shifts in their habitat substrate and have been shown to recolonize nourished beaches.

#### 3.2.5.5 Wetlands

No special wetland sites have been identified at the project site that could be adversely affected by the proposed project.

### 3.2.6 Proposed Disposal Site Determination

Construction of this project has been found to be a practical and feasible alternative for shore protection for Tybee Island. The site has a history of erosion. Placement of suitable material on the site is expected to be beneficial to the beach as it would be expected to increase the width of the intertidal beach and to provide storm protection.

### 3.2.7 Determination of Cumulative Effects on the Aquatic Ecosystem

Construction of protective measures to control erosion at Tybee Island was undertaken as early as 1882 with the construction of three rock groins at the north end of the island. This was followed by many other features that have been damaged or destroyed by wind and wave action. The proposed work would allow for continued renourishment of the authorized Federal project. No significant adverse cumulative impacts have been identified.

## 4.0 FINDINGS OF COMPLIANCE OR NONCOMPLIANCE WITH RESTRICTIONS ON DISCHARGE

### 4.1 DETERMINATIONS

a. That an ecological evaluation of the discharge of dredged material associated with the proposed action has been made following the evaluation guidance in 40 CFR 230.6, in conjunction with the evaluation considerations at 40 CFR 230.5.

b. That potential short-term and long-term effects of the proposed action on the physical, chemical, and biological components of the aquatic ecosystem have been evaluated and it has been found that the proposed discharge will not result in significant degradation of the environmental values of the aquatic ecosystem.

c. That there are no less environmentally damaging practicable alternatives to the proposed work that would accomplish project goals and objectives.

(1) That the proposed action will not cause or contribute to violations of any applicable State water quality standards, will not violate any applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act, is not likely to adversely affect the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, and will not violate any requirement imposed by the Secretary of Commerce to protect any marine sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972.

(2) That the proposed work will not cause or contribute to significant degradation of the Waters of the United States.

(3) That the discharge includes all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem.

### 4.2 FINDINGS

Based on the determinations made in this Section 404(b)(1) evaluation, the finding is made that, with the conditions enumerated in this document, the proposed action complies with the Section 404(b)(1) Guidelines.

# APPENDIX B

# BIOLOGICAL ASSESSMENT OF THREATENED AND ENDANGERED SPECIES (BATES)

## TYBEE ISLAND, GEORGIA
## SHORELINE PROTECTION PROJECT
## 2019 HURRICANE HARVEY, IRMA, MARIA
## EMERGENCY SUPPLEMENTAL RENOURISHMENT

**U.S. ARMY CORPS OF ENGINEERS**
**SAVANNAH DISTRICT**

**APRIL 2019**

**Biological Assessment of Threatened and Endangered Species**
**for**
**Tybee Island, Georgia Beach Erosion Control Project**
**2019 Hurricane Harvey, Irma, Maria**
**Emergency Supplemental Renourishment**

## 1. Project History.

Tybee Island is located 17 miles east of Savannah at the mouth of the Savannah River on the Atlantic Ocean. Tybee Island is Georgia's most densely developed barrier island, bordered on the north by the South Channel of the Savannah River, on the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. Figure 1 shows the project location of Tybee Island.

The authorized project consists of nourishment of 13,200 linear feet of beach between two terminal groins (referred to as Oceanfront Beach); construction of a groin field along 1,100 linear feet of shoreline from the southern terminal groin around the South Tip to the mouth of Tybee Creek (also known as Back River) including periodic nourishment (referred to as South Tip Beach); and construction of a groin field and nourishment of 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach; Figure 1). The remaining shoreline from the fishing pier to the mouth of Horse Pen Creek, although included in the authorizing language of WRDA 1996, is relatively stable at this time and no hurricane and storm damage protection measures have been constructed in this reach. The beach was last renourished in 2015 and repaired in 2018. In 2019, there will be 5 years left in the project life (i.e. Federal participation). The 2015 renourishment was intended to provide material to maintain the beach and guard from potential erosion through 2024. After hurricanes Matthew in 2016 and Irma in 2017, supplemental nourishment was conducted in 2018 to add material that was lost due to storm damage. The Borrow Area Extension of 2008 (BAE 08) was used for the 2008 and 2015 renourishments and the 2018 hurricane repairs. BAE 08 has been exhausted, requiring an expansion of the borrow area.

Previous investigations have found that dunes within the federal footprint would protect the Federal investment, improve the storm protection benefits, decrease maintenance costs, and delay the need for subsequent renourishment projects (USACE 1988, USACE 1994). Historic erosion rates across the beach profile have shown high erosion in areas known as "hot spots" (Figure 2). The following is a quote from the Section 905(b) Study, dated Sept. 2004, "Since 1975, over 6.9 million CY of sand have been placed along Tybee's shoreline. The net erosion rate estimated for the beach erosion control project is approximately 78,000 CY/yr. However, hot spots alone that occur primarily at Second Street lose over 125,000 CY/yr". These hot spots create areas that are vulnerable to storm surge - causing damage to infrastructure, existing dunes and breaches in the design template.


Figure 1: Tybee Island Shore Protection Map Location


Figure 2: Tybee Island erosion hotspots.

2. Project Description

As proposed, the project will be constructed using a hydraulic cutterhead pipeline dredge and support equipment. A submerged pipeline will extend from the borrow site to the southerly tip of Tybee Island. Submerged pipeline shall rest on the ocean bottom and will not move. Shore pipe will be progressively added to perform fill placement along the shorefront or creekfront areas to be renourished. Temporary toe dikes will be utilized in a shore parallel direction to control the hydraulic effluent and reduce turbidity. The sand will be placed in the form of varying design templates based upon longshore volumetric fill requirements which reflect beach conditions at the time of construction.

South Tip Beach incurred a 50' wide breach in the construction template after Hurricane Matthew along with erosion to existing dunes. Surveys after Hurricanes Irma showed an increase in the breach and continued erosion of the dunes. A field examination in October of 2018 shows the breach has exposed the dunes to continuous erosion from wave action.

The proposed project template design is based on project performance and erosion rates since the last renourishment project in 2018, the calculated storm damage, and the proposed dune construction sites.

Project elevations for design and construction are established from NOAA tide gage Station 8670870 at Fort Pulaski, GA and based on MLLW in accordance with ER 110-2-8160 and EM 110-2-6056. Conversion from MLLW to NAVD88 at Station 9670870: +0' MLLW = +4.05' NAVD88.

Beach widths on the Oceanfront Beach will vary from a 25-foot width berm, to a berm approximately 350 feet wide at the elevation of +11.2 MLLW. Based on natural angle of repose on the existing beach, and experience with previous placement, a beach slope of 1 vertical on 25 horizontal will be required on the oceanfront beach. Figure 3 shows the proposed design template.

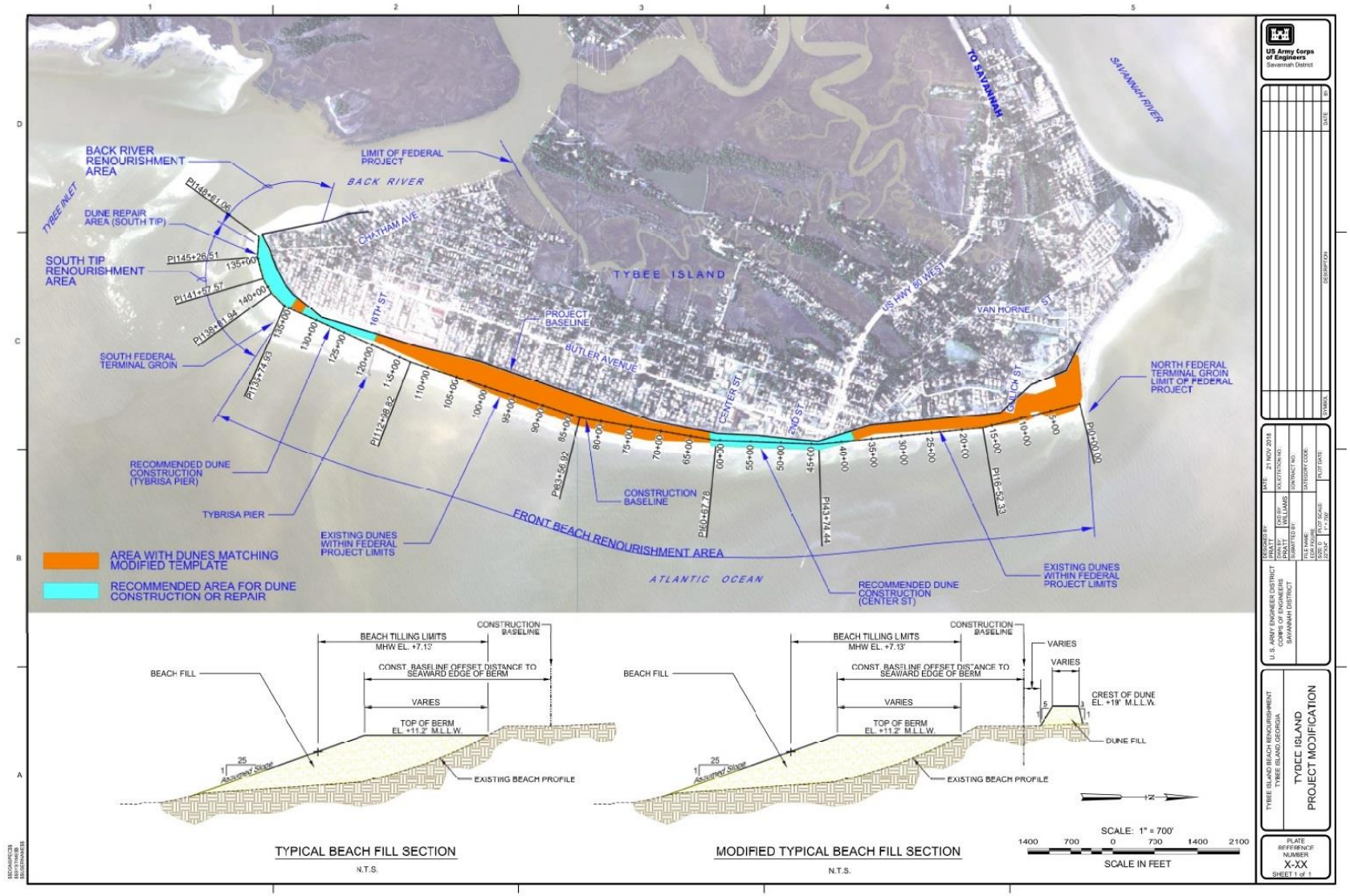


Figure 3: Tybee Island Project description. Typical Beach Fill (Action Alternative B). Modified Typical Beach Fill (Action Alternative C). Existing dunes within the federal project are shown in orange. Recommended dune construction areas (Action Alternative C) are shown in blue

The proposed sand source for this renourishment is the 2019 BAE (Figure 4). The original borrow area is located approximately 4,000 feet southeast of the southernmost Federal terminal groin. The borrow site limits need to be extended, principally in a northerly direction, since the volume of sand remaining within the previously permitted area was deemed insufficient to construct the 2019 HIM Sup renourishment project in its entirety. Extension of the borrow site in a northward direction was selected to avoid potential impacts to Little Tybee Island CBRA Unit No.1 to the south. Additionally, expansion of the borrow site to the east was not pursued due to the silty nature of the material to the east (i.e. seaward) of the previously authorized borrow site. The total area of the 2019 proposed borrow area extension is ~664 acres. Total area of the 2015 borrow area is ~213 acres. Total area of the 2008 borrow locations is ~256 acres. Total of yellow "original borrow area limits" is ~290 acres. The total area of the whole borrow area including the extension is ~1,380 acres.

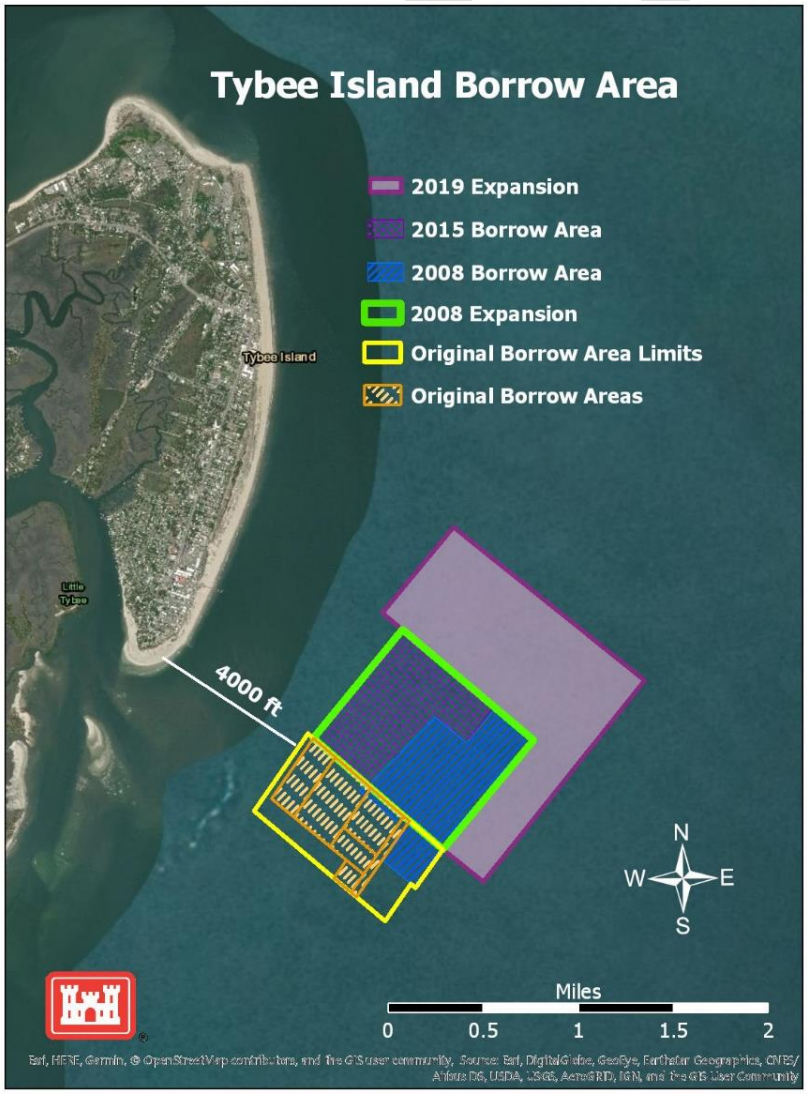


Figure 4: Tybee Island Borrow Area history and future expansion plans.

## 2.0 Environmental Setting.

The project area is located on Tybee Island, one of the most developed barrier islands on the coast of Georgia. The mainland of Chatham County is separated from the Atlantic Ocean by marsh and barrier islands. The islands are separated from one another by tidal creeks and inlets. Tybee Island is located south of the Savannah River entrance, about 17 miles east of the city of Savannah, Georgia. It is bounded on the north by the Savannah Harbor, to the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. The major portion of the land mass above high tide is occupied by the City of Tybee Island which is the only population center on the island.

- Historically, dune areas on Tybee Island have been replaced by sea walls and revetment. Construction of residences, hotels and other businesses has removed much of the natural areas on the island. Efforts to construct dunes on Tybee have been locally driven. Large dunes have formed in front of sand fencing and around catwalks along the oceanfront beach intermittently between 2nd street and the South end. Dunes have also formed along Back River. Dunes currently occur discontinuously along approximately 80% of the landward side of the federal project footprint. The average height of Tybee Island dunes is approximately 18.5 ft MLLW (Range: 12-23 ft MLLW).

- The proposed project will include the incorporation of the existing dunes in the project area as well the construction of additional dunes within the federal footprint. Recommended dune construction within the federal project includes 3,700 linear feet of the Front Beach renourishment area addressing hot spots (Figure 2). In addition, approximately 1,100 linear feet along the South Tip renourishment area would be considered for dune construction in order to rebuild dunes to meet the requirements of the recommended template.

- The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. The recommend dune portion of the template will use a 1:5 slope on the seaward side of the dune and a 1:3 slope on the landward side of the dune based off of the field data collected. Dune crest height of +19' MLLW is recommended to protect against storm surge with a 1% exceedance probability while taking into consideration sea level rise. A dune crest width of at least 15' is recommended allowing for construction of dunes within the federal foot print and maintaining a distance from the edge of the berm that will prevent erosion to the dunes from wave action. Sand fencing could be placed at the landward and seaward toe of the dune to limit pedestrian traffic.

- Primary influences on the morphology of Tybee Island include tidal fluctuations, tidal currents, and nearshore waves. The study area has a mean tidal range of 6.8 feet and a spring tide range of approximately 9.0 feet.

- The major wetland habitat types in the project area belong to the marine and estuarine systems (Cowardin et al., 1979). The marine system consists of the open ocean overlaying the continental shelf and its associated high-energy coastline. The sub-systems include: 1) the marine subtidal unconsolidated bottom, which is the sand bottom that is continuously submerged; and 2) the marine intertidal unconsolidated shore, which is the beach area. Estuarine systems consist of deepwater tidal wetlands and adjacent tidal wetlands along Back River and Horse Pen Creek. The estuarine subsystem includes subtidal unconsolidated bottom and aquatic bed and intertidal streambed, unconsolidated shore and emergent wetlands.

- The Oceanfront Beach has a wide, gently sloping shelf with a typical slope of 1 vertical on 20 horizontal in the intertidal zone along the front beach. Offshore depths drop off rapidly to 20 or 30 feet along the northern end of the Back River area, with a more gradual transition to the south.

- In efforts to control erosion on the oceanfront, numerous groins and revetments have been constructed as well as a seawall constructed between 1936 and 1941. This sea wall has a top elevation of 12.2 feet above MLLW. Although the seawall has provided some protection of property, it has also caused additional lowering of the beach profile due to reflected wave action.

- The State of Georgia and Georgia Port Authority placed sand material (285,000 c.y.) on the Oceanfront and 50,000 c.y. on the South Tip Beach in 1995 and constructed a series of three groins south of the Federal south groin in an effort to alleviate the extensive erosion at this portion of the beach and stop the potential for failure of the south end seawall.

**3.0 Threatened and Endangered Species**.

The species listed on Table 1 may be found in the general project area and have been classified as threatened or endangered pursuant to the Endangered Species Act of 1973 (ESA). As such, these species must be protected from adverse impacts that could be expected to cause damage either to the individuals or to habitat that has been found to be critical for their survival. In accordance with Section 7 of the ESA of 1973, Savannah District has evaluated the impacts the proposed action could have on any threatened or endangered species potentially occurring in the project area. Each of these species will be described in detail with respect to their sightings and habitat in Chatham County, Georgia. Manatees, right whales, piping plovers and loggerhead sea turtles are the species most likely to be impacted by the proposed project. A new Biological Opinion (BO) for the project was issued on July 18, 2008 by U.S. Fish and Wildlife Service (USFWS). The BO addresses project effects on nesting loggerhead and leatherback sea turtles, non-breeding piping plovers, and designated critical habitat unit GA-1. The Savannah District and USFWS concurred the 2008 renourishment was not likely to adversely affect the Florida manatee based on the inclusion of the special manatee conditions listed in this BATES (section 4.02, 8.00, and attachment EA-4) and the BO.

The USFWS reserves the right to issue an updated BO during the Pre-Construction Engineering and Design phase.

To ensure protection of individuals of threatened and endangered species, each dredging and construction contract for the Tybee Island Shore Protection Project (TISPP) contains special conditions to minimize adverse impacts.

Table 1: Federal Threatened and Endangered Species

| **U.S. Fish and Wildlife Service Jurisdiction** | | |
|---|---|---|
| **Common Name** | **Scientific Name** | **Status** |
| Florida manatee | *Trichechus manatus latirostris* | Endangered |
| Piping plover* | *Charadrius melodus* | Threatened |
| Red Knot | *Calidris canutus rufa* | Threatened |
| Wood stork | *Mycteria americana* | Endangered |
| Bachman's warbler | *Vermivora bachmanii* | Endangered |
| Kirtland's warbler | *Dendroica kirtlandii* | Endangered |
| Red-cockaded woodpecker | *Picoides borealis* | Endangered |
| Eastern Indigo snake | *Drymarshon corais couperi* | Threatened |
| Loggerhead sea turtle*+ | *Caretta caretta* | Threatened |
| Leatherback turtle+ | *Dermochelys coriacea* | Endangered |
| Flatwoods salamander | *Ambystoma cingulatum* | Threatened |
| Pondberry | *Lindera melissifolia* | Endangered |
| **National Marine Fisheries Service Jurisdiction** | | |
| North Atlantic Right Whale* | *Eubalaena glacialis* | Endangered |
| Sei Whale | *Balenoptera borealis* | Endangered |
| Blue whale | *Balaenoptera musculus* | Endangered |
| Sperm whale | *Physeter macrocephalus* | Endangered |
| Fin whale | *Balaenoptera physalus* | Endangered |
| Humpback whale | *Megaptera novaeangliae* | Endangered |
| Hawksbill turtle | *Eretmochelys imbricata* | Endangered |
| Green turtle | *Chelonia mydas* | Threatened |
| Kemp's Ridley turtle | *Lepidochelys kempii* | Endangered |
| Shortnose sturgeon | *Acipenser brevirostrum* | Endangered |
| Atlantic sturgeon* | *Acipenser oxyrhyncus* | Endangered |

*Critical Habitat for this species found within or near the project area.

+ Species also under the National Marine Fisheries Service Jurisdiction

NOTE: List developed by the USFWS, Information for Planning and Consultation (IPaC) Website, October 2018

## 4.0 Discussion of Potential Impacts.

The Savannah District reviewed information concerning each of these species and evaluated the potential for the proposed action to impact these species. The results of the evaluation are contained in the following paragraphs:

### U.S. Fish and Wildlife Service Jurisdiction

- **Manatee.**

Manatees inhabit sluggish rivers, sheltered marine bays, and shallow estuaries, eating most aquatic plants and any terrestrial plants they can reach. Records in Georgia are primarily random sightings and carcass finds and are not the result of systematic research. Systematic aerial surveys were initiated in 1976, and sight records have been increasing in south Georgia in recent years. The Georgia population is primarily migratory in nature and, therefore, fluctuates with season. The majority are sighted in the southern portions of the Georgia coast. Manatees are found in Georgia mainly during the warmer months of the year. During the winter months, most manatees are restricted to peninsular Florida. During the summer, manatees disperse with some individuals moving north along the Atlantic Coast and others west along the Gulf coast. Manatees are known to inhabit both salt and fresh water habitats throughout their range where sufficient depths are available (1-5.5 yards or more). Between October and April, manatees appear to concentrate in areas of warmer water; during other months, they appear to choose areas with an adequate food supply and water depth, often in close proximity to a source of fresh water.

The likelihood of an encounter with a manatee therefore, varies with season but is not likely to occur in the surf zone along the beach during project construction.

Georgia Department of Natural Resources (GA DNR) has records of manatees observed in the vicinity of Little Tybee and Tybee Island. This includes manatees observed in the Back River at Tybee Island, back side of Tybee Creek, and in Lazaretto Creek near Tybee Island. There are other records from the Wilmington and Bull Rivers that place manatees in the general vicinity of Little Tybee.

The proposed beach renourishment and dredging operations *may affect manatees* because the species does occur in the general vicinity of the proposed project area *but are not likely to adversely affect manatees* because any dredging contract issued would include the special conditions listed below to ensure protection of manatees (USACE, 1998) including that all submerged pipeline will be on the ocean bottom and not allowed to move.

- **Piping Plover.**

The piping plover (*Charadrius melodus*) is a migratory shorebird endemic to North America. This species is a small, stocky shorebird that resembles sandpipers. The piping plover was listed by the USFWS as threatened and endangered on December 11, 1985. Preferred habitats for the species are sandy beaches along the ocean and inland lakes, bare areas in dredge disposal sites, and natural alluvial islands in rivers. Shorelines with little vegetation are preferred for both nesting and feeding. These plovers feed primarily on fly larvae, beetles, crustaceans, mollusks, and other invertebrates that they pluck from the sand (Bent, 1929). Breeding grounds along the Atlantic Coast range from Newfoundland to North Carolina. Wintering areas on the

Atlantic Coast are from North Carolina southward through Florida and in the Bahamas and West Indies. This species occurs on Tybee Island as a winter resident. It departs its breeding grounds for wintering areas by early September and returns to its breeding grounds in late March or early April. This species has been observed as early as August on Wassaw Island and as early as October at Tybee Island where it is most often found on the north end of the island, west of the north jetty and outside the project area (Steve Calver, personal communication). The species generally avoids areas frequently disturbed by humans and pets. No work would be done in the area in which the species is most often observed. Therefore, disturbance to the species is expected to be minimal since this bird is highly mobile and feeds through the area. Newly deposited material may temporary enhance feeding opportunities, although the work is expected to later result in a temporary decline in some benthic organisms on which this species may feed (USACE, 1998).

USFWS designated critical habitat for the piping plover in its wintering range on July 10 2001 (66 FR 17; 36038-36143). Critical habitat includes the land from the seaward boundary of MLLW to where densely vegetated habitat, not used by the species, begins and where the constituent elements no longer occur. Paved areas such as parking lots are not considered critical habitat. The project area does contain habitat which has been designated as being critical for the species' survival. There are five critical habitat units for wintering piping plover within the vicinity of Tybee Island, extending from Unit GA-1 at the north end of the TISPP area south to Unit GA-5 on Ossabaw Island (Figure 5). Unit GA-2 is located immediately south of the project area on Little Tybee Island and Units GA-3 and GA-4 are located south of Little Tybee Island on Wassaw Island. A small portion of the north end of the project (approximately the first 2,300 feet south of the north jetty) is within the Critical Habitat Unit GA-1 for piping plovers (See Figures 5, 6, and 7). Piping plovers may be found on the north tip of Tybee Island between August and early April; therefore, project construction would occur during the months when wintering piping plover would be utilizing the critical habitat. Although the designated critical habitat contains a portion of the front beach south of the north jetty, the species generally favors tidal flats occurring west of the north jetty. Direct, short-term foraging habitat losses would occur along the beach during sand placement within Unit GA-1 during the winter months. However, since only a small portion of Critical Habitat Unit 1 will be directly affected by beach fill placement, adjacent foraging habitat would be available for wintering piping plover immediately west of the construction area within Unit GA-1. The majority of Unit GA-1 would remain undisturbed during construction activities, and high-quality foraging habitat for piping plover and other shorebird species located north and west of the beach fill placement area would not be impacted.

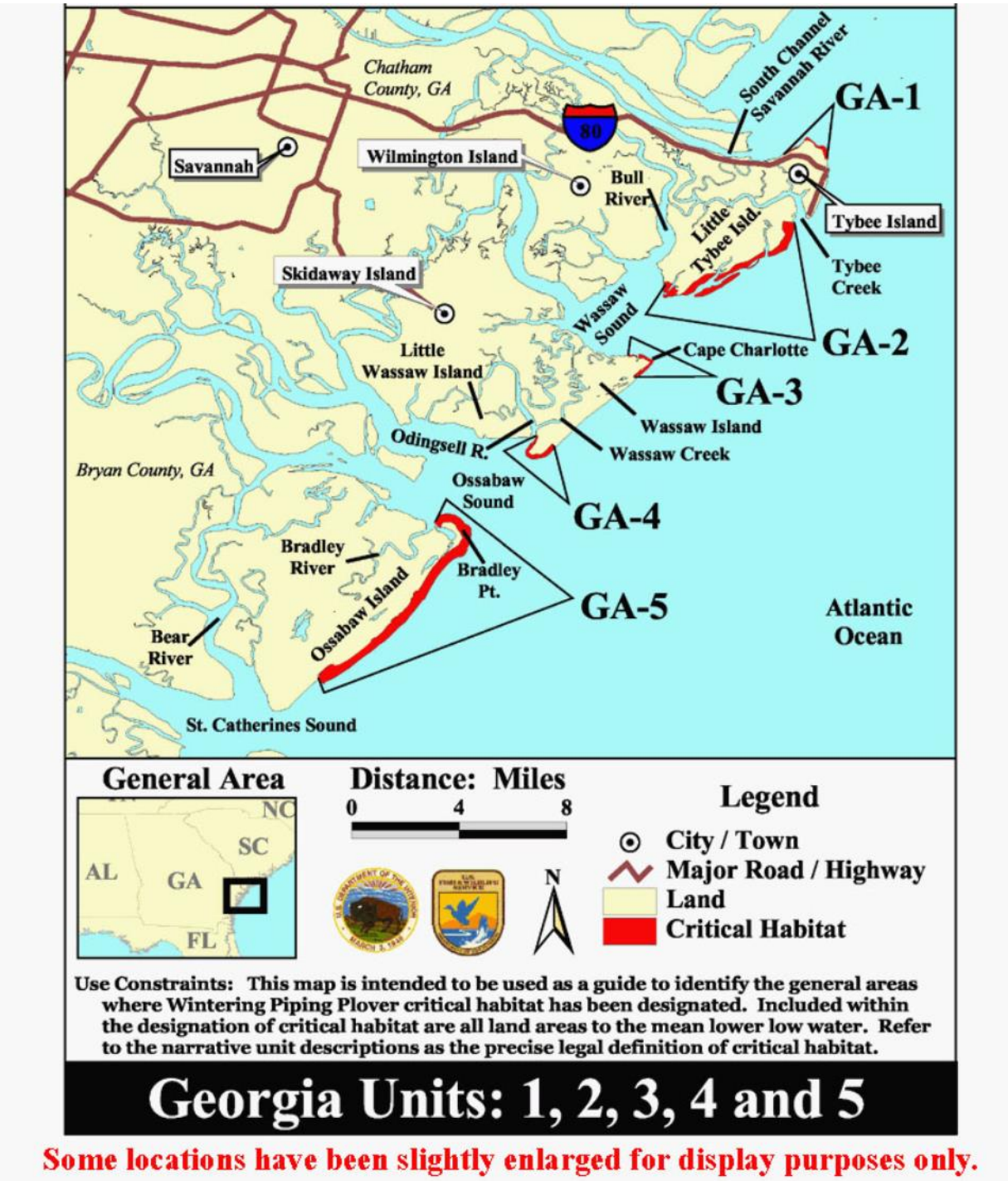


Figure 5: Piping Plover Critical Wintering Habitat: Unit GA-1, Tybee Island (Source: U.S. Fish & Wildlife Service)

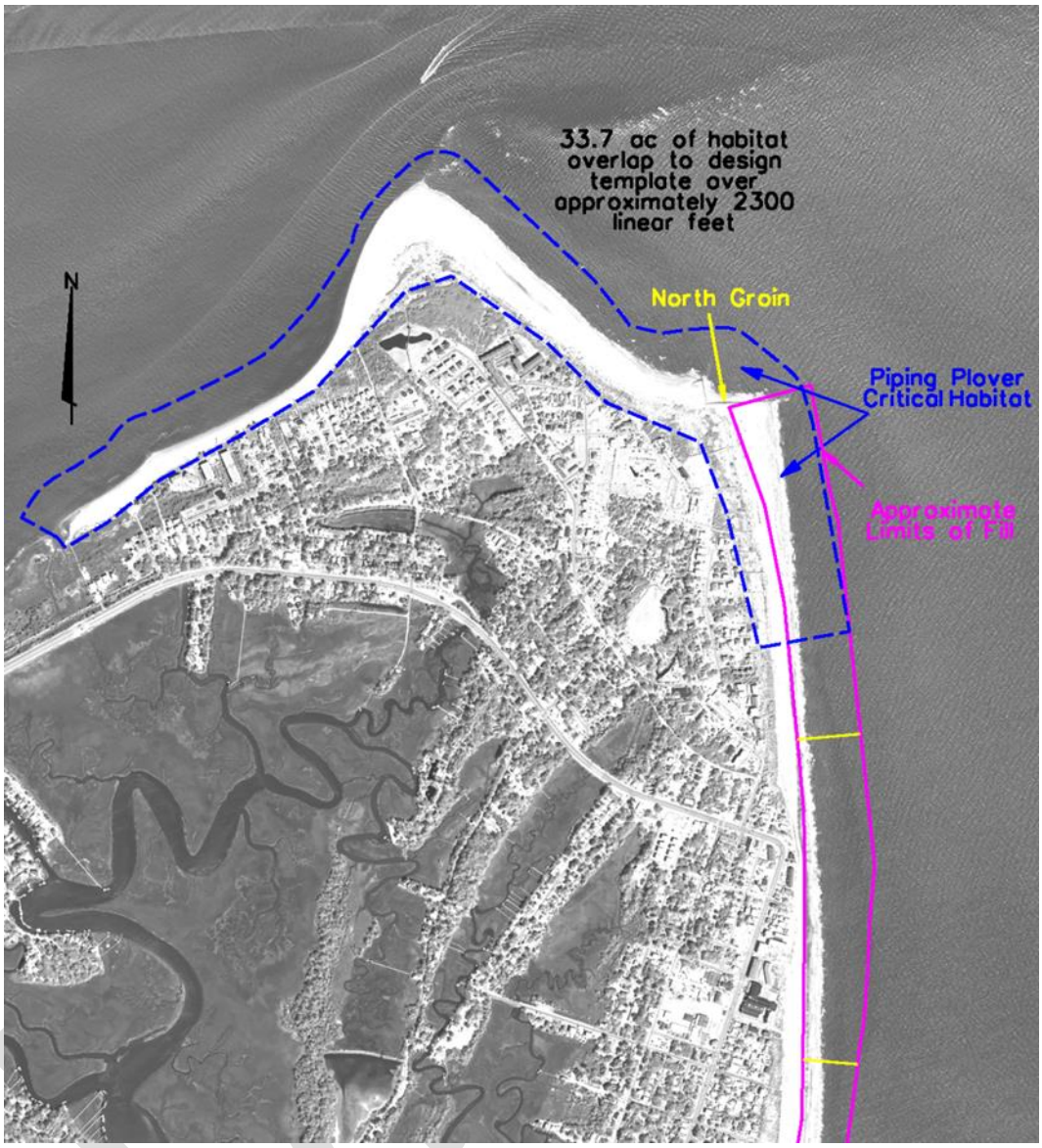


Figure 6: Fill limits for 2019 Tybee Island Beach Renourishment within piping plover Critical Habitat.

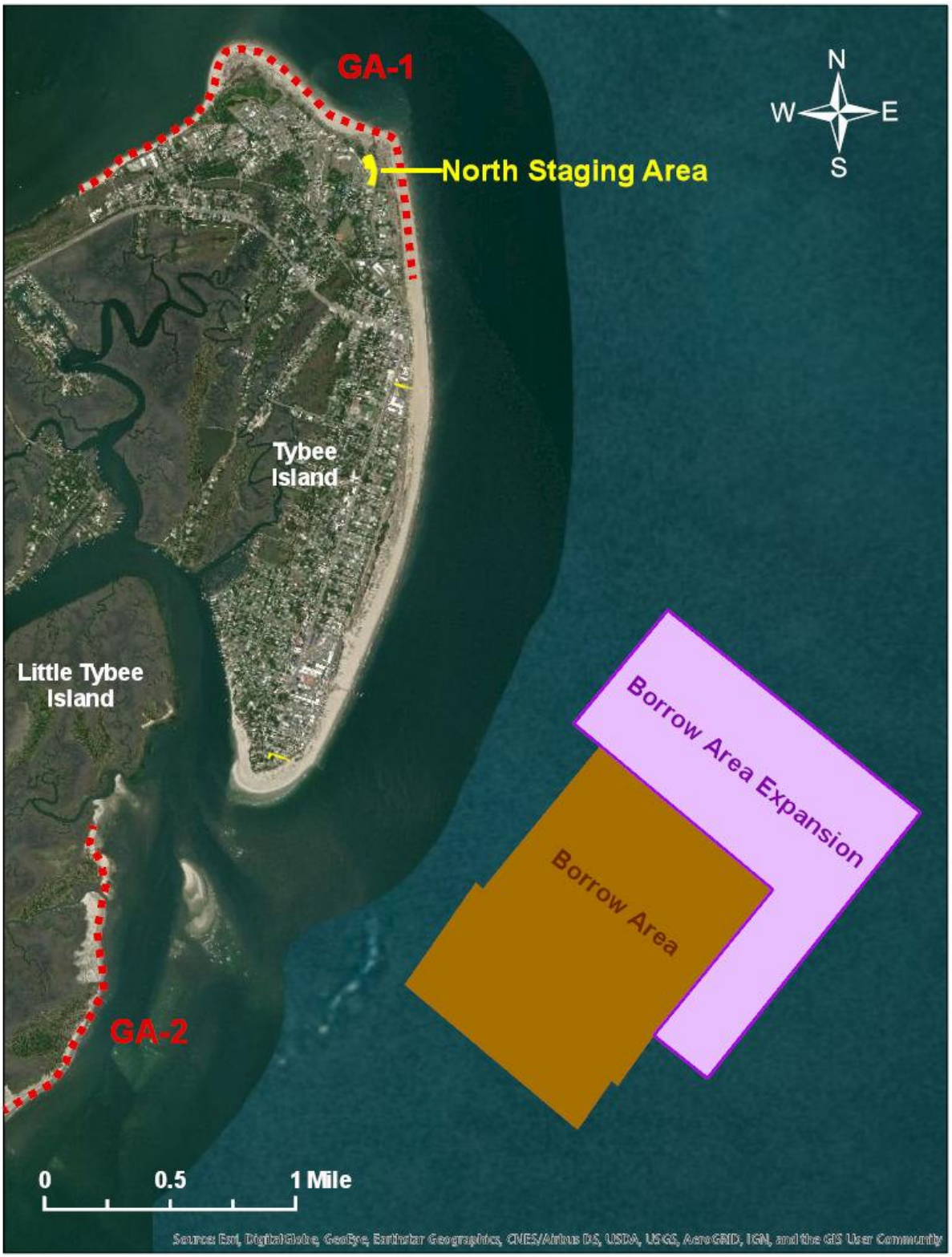


Figure 7: Piping Plover Critical Habitat (red dashed lines) in relation to the borrow area expansion.

During the 2008 renourishment a twice monthly bird survey was conducted pre, during, and post construction over a 9 month period. One of the two surveys per month was conducted of the entire Unit GA-1 between one hour before high tide and one hour after high tide. The other survey was conducted when birds were feeding either at low tide or on a falling tide of the entire beach. Results of the survey discovered Piping plovers were present in Critical Habitat Unit GA-1 during 80% of the north end surveys and during 20% of the entire beach surveys, with a higher abundance observed on the southern tip. No takes were observed or reported (USACE Tybee Island 2008 EA and Bird Survey). No piping plovers were observed near the active construction sites. Several gull species, sanderlings, boat tailed grackles, and at least one willet were observed gathering at the dredge pipe output area presumably to feed on any species coming through the pipe. Most birds avoided the pipeline output. During tilling operations, all bird species tended to avoid the active construction area.

During the 2015 renourishment, a similar bird survey was conducted pre, during, and post construction over a 12 month period by USACE Savannah District Biologists. Approximately 43 piping plovers were seen either foraging for food or roosting between the months of August 2014 and April 2015. According to the notes take at the time of the survey, none of the piping plovers seemed to be impacted by the renourishment construction. Only a few of the piping plovers observed seem to be disturbed by regular people on the beach, and some were even seen to be very tolerant of people walking by them.

The proposed project has the potential to adversely affect critical wintering habitat unit GA-1, as well as overwintering and migrating plovers within the proposed project area. The Savannah District will work closely with the USFWS to ensure special protection measures are implemented to minimize impacts to the Piping plovers. Since a small portion of the Critical Habitat will receive material that area may receive positive impacts from increased feeding and roosting areas although a decline in benthic organisms in the renourished segment is likely for a short time span due to covering by fill. It is expected benthic organisms will naturally re-populate the areas of fill over time. Additional minor disturbance of foraging activities is possible due to the location of a construction staging area located west of the beach/dune area in the vicinity of Fort Screven (North Staging Area; Figure 7). No equipment or supplies would be stored within the critical habitat area. Given that the construction staging area will be limited to the upland area in the vicinity of the north beach parking lot potential impacts should be temporary and minor. It is likely that the birds would avoid the immediate construction staging area and utilize the foraging habitat immediately adjacent to this area within Unit GA-1 (Miller et. al., 2008).

Required shorebird monitoring during construction activities in the vicinity of Unit GA-1 and establishment of buffer zones during construction operations should provide sufficient protection for wintering piping plover. Therefore, direct impacts to foraging activities along the beach shoreline should be minimal. Refer to the USFWS BO for a complete analysis of direct, indirect, and cumulative effects of the proposed action on

critical habitat for piping plover. A 200-foot buffer zone shall be established around feeding piping plovers. Any construction related activities that could potentially harass feeding piping plovers shall cease while piping plovers are in the buffer zone. Construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall be implemented if birds appear agitated or disturbed by construction related activities. Site-specific buffers shall be implemented adjacent to the travel corridors or staging area. The three staging areas that will be used during construction are shown on Figure 1.

Some activity would be maintained within the designated construction areas on a daily basis, without directly disturbing any shorebirds documented on site or interfering with sea turtle nesting, especially when those corridors are established prior to commencement of construction. The direct placement of sand within the project area will result in high mortality of benthic infauna at the beach fill site. The majority of infaunal loss will be in the shallow waters of the surf zone. Infaunal prey density has frequently been shown to affect habitat use in shorebirds (Goss-Custard et al. 1991). Research by Peterson et al. (2006) suggests that impacts to foraging habitat for shorebird species within the proposed Tybee Island project area would be short-term (less than one-year) (Miller et. al, 2008).

In order to minimize impacts to piping plovers during the beach renourishment effort, and while sand is being placed on the beach, a 200 foot buffer zone will be established around those piping plovers that are seen within the project area feeding. If necessary, construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. Any construction related activities that could potentially harass feeding piping plovers shall cease while piping plovers are in the buffer zone. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall also be considered if birds appear agitated or disturbed by construction related activities.

The proposed beach renourishment and dredging operations *may affect piping plovers and their critical habitat* because the species and a portion of its critical habitat does occur in the proposed project area *but are not likely to adversely affect piping plovers or adversely modify their critical habitat* because any dredging contract issued would include the special conditions mentioned above and listed below to ensure protection of piping plovers (USACE, 1998). It is the District's belief that the piping plover would ultimately benefit from the project due to erosion control of the bird's critical habitat area.

- **Red Knot.**

The red knot is another migratory shorebird endemic to North America. In the Western Hemisphere the red knot breeds in the mid to high arctic tundra of Alaska, Canada, and Greenland. Most breeding habitats are near coastal areas, often on islands. Nest sites are generally on dry, sunny, and slightly elevated areas of tundra, frequently on open gravel ridges or slopes. During migration this species switches to coastal beaches usually at or near the mouth of bays, estuaries, or tidal inlets. Staging sites are associated with high wave-energy coastal areas. Wintering sites are generally intertidal habitats such as beaches with significant wave action or currents.

As stated on the GA DNR, Biodiversity Portal Website for Rare and Natural Elements website, within the state of Georgia, red knots can be found on any Georgia barrier beach within the winter spring events. It has been found that the red knots have been seen on Little Tybee, Wassaw, St. Catherines, Blackbeard, Sapelo, Little St. Simons, and Cumberland Islands, as well as St. Catherines Island Bar most often during those timeframes, while Wolf Island, Little Egg Island Bar, and Little St. Simons Island at the mouth of the Altamaha River support the only known late summer and fall staging site on the east coast of the U.S., attracting as many as 12,000 knots at one time.

During the last major beach renourishment on Tybee Island, USACE Savannah District Biologist conducted bird counts approximately every 2 weeks between August 2014 and August 2015. During that timeframe red knots were seen within the project area between the months of January 2015 and May 2015 ranging from approximately 4 birds and 45 birds per site visit.

In order to minimize impacts to red knots during the beach renourishment effort, and while sand is being placed on the beach, a 200 foot buffer zone will be established around those red knots that are seen within the project area feeding. If necessary, construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. Any construction related activities that could potentially harass feeding red knots shall cease while red knots are in the buffer zone. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall also be considered if birds appear agitated or disturbed by construction related activities.

The proposed beach renourishment and dredging operations *may affect red knots* because the species does occur in the proposed project area *but are not likely to adversely affect red knots* because any dredging contract issued would include the special conditions mentioned above and listed below to ensure protection of red knots (USACE, 1998). It is the District's belief that the red knots would ultimately benefit from the project due to erosion control of their habitat area.

- **Wood Stork.**

Wood storks are known to frequent the more protected estuarine areas of the region for both feeding and nesting. Wood stork rookeries and nesting areas are located on hammocks and along the edges of the marsh behind the barrier islands. This species has been observed in the Savannah Harbor area, including the upland disposal areas, Wright River, and particularly the Savannah National Wildlife Refuge. These birds have a unique feeding technique and require higher prey concentrations than other wading birds. Optimal water regimes for the wood stork involve periods of flooding, during which prey (fish) populations' increase, alternating with drier periods during which receding water levels concentrate fish at high densities.

The proposed beach renourishment and dredging operations *will have no effect on wood storks* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Bachman's Warbler.**

The present distribution of Bachman's warbler is unknown. Some authors consider it to probably be extinct (Post and Gauthreaux, 1989). Sightings in the mid 70's came from Charleston County, South Carolina; several Louisiana locations; Kentucky; Maryland; and near the Long/McIntosh County line in Georgia. The last sighting in Georgia was in 1976. This species formerly bred mostly in swamps with an understory of cane. It is currently extremely rare with very few recent sightings. Most authorities agree that if the Bachman's warbler still exists it is most likely in the I'on Swamp area in Charleston and Berkeley Counties, South Carolina.

The proposed beach renourishment and dredging operations *will have no effect on Bachman's warbler* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Kirtland's Warbler.**

This very rare warbler breeds in Michigan and winters in the Bahamas. It is a rare transient along the Southern Atlantic Coast, including Georgia. We are aware of no estimate of the number of individuals migrating through the state. It would be expected to occur as a very rare migrant in coastal scrub and forest land, especially after storms.

The proposed beach renourishment and dredging operations *will have no effect on Kirtland's warbler* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Red-cockaded Woodpecker.**

This species requires forested habitat of at least 50 percent pine 30 years or older. No habitat that could potentially be used by this species would be impacted by the project. No known colony of these woodpeckers is located along Tybee Island.

The proposed beach renourishment and dredging operations *will have no effect on red-cockaded woodpeckers* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Eastern Indigo Snake.**

This snake seems to prefer high, well-drained sandy soils, such as the sandhill habitat preferred by the gopher tortoise. During the warmer months, these snakes also frequent streams, swamps, and occasionally flat woods.

The proposed beach renourishment and dredging operations *will have no effect on eastern indigo snakes* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Sea Turtles.**

Five species of threatened or endangered sea turtles are found along the Georgia coast. These include the Kemp's (Atlantic) Ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*), and Hawksbill turtle (*Eretomochelys imbricata*). Of these species only 2 have been known to nest on Tybee Island, the loggerhead and the leatherback therefore under the jurisdiction of USFWS. In 2012 Tybee had the highest nesting loggerhead record with 23 nests with an 83.2% mean hatch success rate. Georgia had its highest number of nests statewide during 2012 with 2,244 recorded (www.seaturtle.org). Further agency coordination will be conducted in during 2019 during the public and agency review of the draft EA. In addition, the District determined if the renourishment extends past April 30 loggerhead and leatherback sea turtles are likely to be adversely affected. With implementation of the project with the previous 2008 NMFS and USFWS conditions, this project is not likely to adversely affect sea turtles or their habitat.

The USFWS has designated about 685 miles of coastal beach habitat as important for the recovery of the threatened Northwest Atlantic Ocean population of loggerhead sea turtles, as directed by the ESA (Figure 8). Tybee Island is not included in the listing and does not contain habitat which has been previously designated as being critical for the species' survival. However, Little Tybee Island is designated as LOGG-T-GA-01in the critical habitat registry for USFWS (Figure 9).

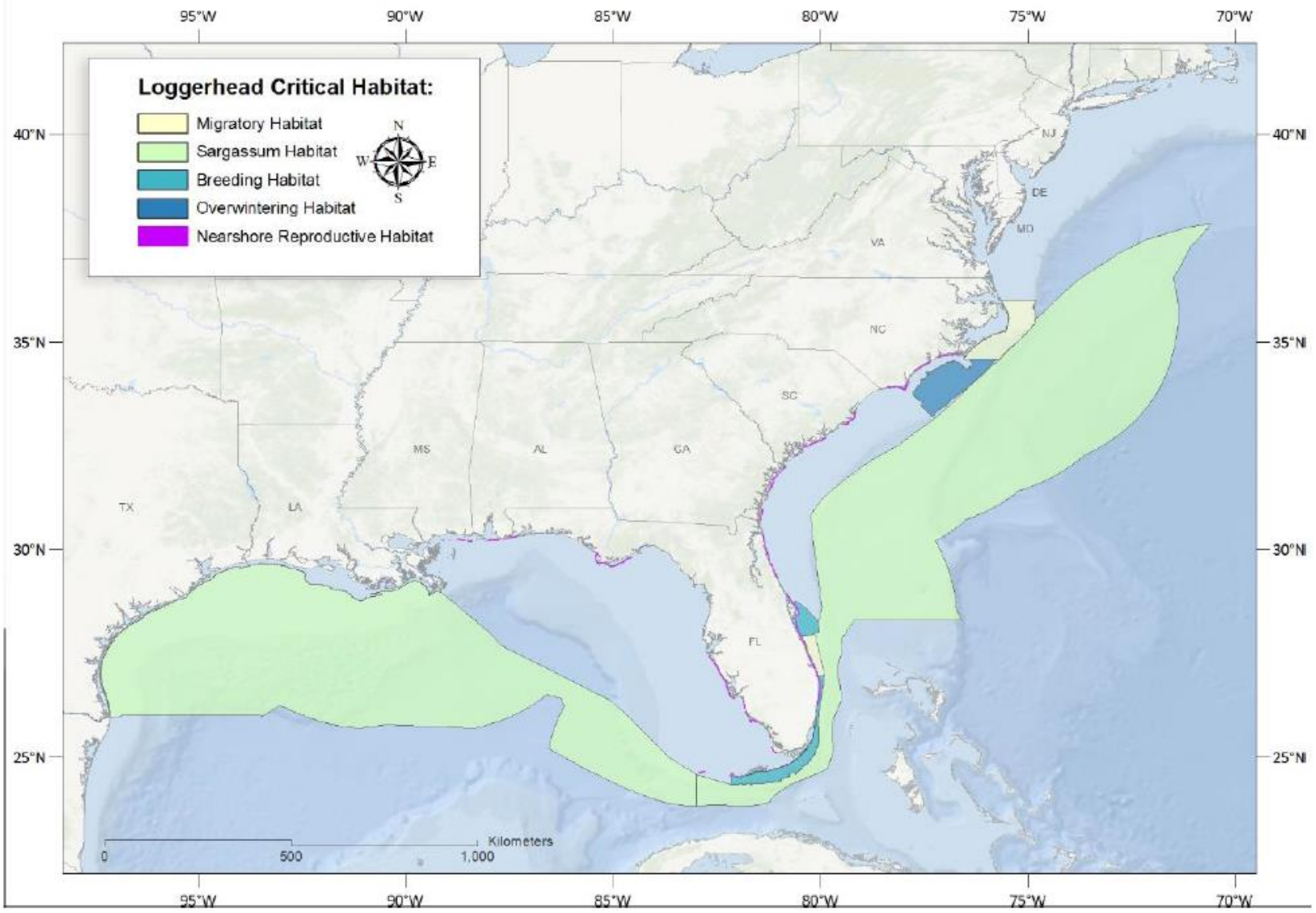


Figure 8: Loggerhead critical habitat designation by USFWS and NMFS.

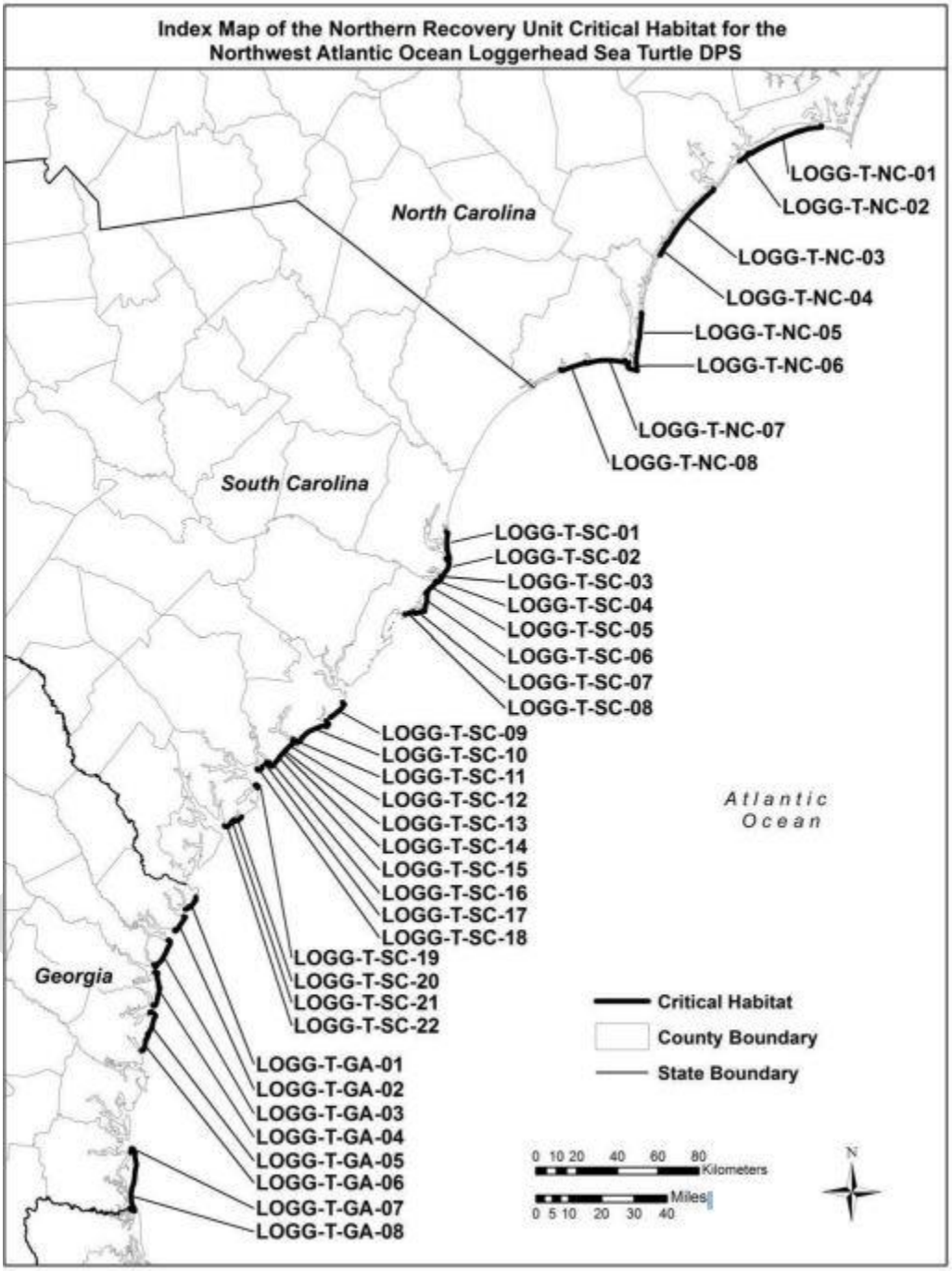

Figure 9: USFWS northern recovery unit critical habitat for the loggerhead sea turtle.

Loss of turtles could occur by means of broken eggs resulting from sand compaction after beach nourishment. Such an event is expected to be unlikely because the dredged material grain sizes are expected to match existing beach sand sufficiently to avoid major compaction problems. Any escarpments in excess of 18 inches extending

for more than 100 feet and exceeding 500 cone penetrometer index units (cpu) would be mechanically leveled to the natural beach contour for two consecutive turtle nesting seasons following renourishment. Only areas of compaction greater than 500 cpu and greater than 18 inches high by 100 feet long need to be mechanically leveled. Escarpments that are not compacted should not be mechanically leveled regardless of their size as they do not present a problem to sea turtles. Direct impacts to nesting and hatching sea turtles will be avoided by project construction outside of the turtle nesting season. The proposed construction window is between November 2019 and 30 April 2020 in order to avoid impacts to nesting and hatching sea turtles, larval fish, macroinvertebrate, and shrimp species. Between 1999 and 2007, the latest recorded hatching date was September 20.

The nesting season for loggerheads in this area extends from May 1 through August 30 and the hatching season extends to October 31. Project construction during sea turtle nesting season in Chatham County (May 1st through October 31st) would involve greater potential for mechanical destruction of nests and burial of nests, greater likelihood for encounters with construction equipment/pipes on the beach during nesting activities; increased beach sand compaction due to the presence of heavy equipment and sand deposition, and negative impacts associated with construction-related lighting. Loss of sea turtles would not be expected from the proposed project because of the conditions in the contract that would be in place to protect nesting turtles (Special Conditions section).

The Savannah District will seek coordination with GA DNR and National Oceanic and Atmospheric Administration (NOAA) Protected Resources Division for any activities which may affect sea turtle nesting. Requirements to minimize adverse impacts will include tilling after construction and monitoring beach profiles and compaction levels for at least 3 years after construction. The City will comply with tilling requirements for the first 3 years after construction. The renourishment project will be tilled to 36 inches and graded immediately after construction as part of the contract.

- GA DNR requires beach construction occur outside the sea turtle nesting season (May 1 – October 31). However, nesting data from Tybee indicate the season is generally over by mid-September.

- Tybee Island has passed a beachfront lighting ordinance that applies, with minor exceptions, to all public and private artificial exterior lights within direct line-of-sight of the beach during nesting season and hatching season. A copy of the ordinance can be found at Attachment EA-2 of this document. This ordinance seeks to minimize disturbance and disorientation to nesting turtles and hatchlings.

The proposed beach renourishment and dredging operations *may affect loggerhead and leatherback sea turtles and the loggerhead critical habitat* because these species and a portion of the loggerhead critical habitat does occur near the proposed project area *but are not likely to adversely affect loggerhead and leatherback sea turtles or*

*adversely modify loggerhead critical habitat* because any dredging contract issued would include the special conditions mentioned above and listed below to ensure protection of sea turtles (USACE, 1998). It is the District's belief that sea turtles would ultimately benefit from the project due to erosion control of the species' nesting areas.

- **Flatwoods Salamander.**

Adults and subadults prefer open mesic pine/wiregrass flatwoods dominated by longleaf or slash pine. During breeding season (Oct-Dec) salamanders move to isolated, shallow, small depression (forested with emergent vegetation) that dry on a cyclic basis.

The proposed beach renourishment and dredging operations *will have no effect on the flatwoods salamander* because no suitable habitat for this species would be impacted by beach nourishment activities.

- **Pondberry.**

Habitat includes shallow depression ponds of sandhills, margins of cypress ponds, and in seasonally wet low areas among bottomland hardwoods.

The proposed beach renourishment and dredging operations *will have no effect on pondberry* because no suitable habitat for this species would be impacted by beach nourishment activities.

**National Marine Fisheries Service Jurisdiction**

- **Whales.**

These are six species of whales listed as endangered in the State of Georgia: North Atlantic right whale *(Eubalaena glacialis*), sei whale (*Balenoptera borealis*), bue whale (*Balaenoptera musculus*), sperm whale (*Physeter macrocephalus*), fin whale (*Balaenoptera physalus*), and humpback whale (*Megaptera novaeangliae*). The proposed beach renourishment and dredging operations *will have no effect on* sei, fin, and humpback whales, because the North Atlantic right whale is the only species likely to be encountered during construction.

**Right Whales**

The National Recovery Plan for the Northern right whale, dated December, 1991 (NMFS, 1991), defines the coastal waters of the southeastern United States and, especially, the shallow waters from Savannah, Georgia, south to Cape Canaveral, Florida, as the wintering ground for a small but significant part of the Atlantic right whale population.

Right whales visit the coasts of Georgia and Florida to calve in shallow offshore coastal waters. The winter calving season for the right whale appears to begin as early as September and can end as late as April. The peak of right whale abundance off the coast of Georgia is from December through March. This coincides with the construction window for the proposed TISPP. Most right whales spotted in the southeast are found from 1 to 15 nautical miles offshore (Kraus et al. 1993; Ellis et al. 1993). A BO issued by the NMFS on 25 November 1991 concluded that pipeline dredges were not likely to adversely affect listed whale species. Therefore, no adverse impacts to right whales are expected while using pipeline dredges.

Accidental collisions with shipping vessels appear to be the most serious threat to right whales. To ensure that the proposed shore protection project would not impact right whales or other whale species and dolphins, the contractor shall be required to implement an endangered species watch plan during project construction. The Endangered Species Watch Plan shall be similar to previously approved watch plans for the Tybee Island Erosion Control Project detailed in the Biological Assessment of Threatened and Endangered Species for the South Tip Beach/Tybee Creek Project (USACE 1997 and 2008). The watch plan shall extend for the entire period of dredging and transportation of material from the borrow area to the beach project area. The Right Whale Early Warning Systems (RWEW) shall be in place during the period of project construction, and the dredging contractor would be required to abide by all operating rules emanating from the RWEW system.

NMFS issued a final rule to replace the critical habitat for right whales in the North Atlantic with two new areas in February 2016. The areas designated as critical habitat contain approximately 29,763 nm2 of marine habitat in the Gulf of Maine and Georges Bank region (Unit 1) and off the Southeast U.S. coast (Unit 2; Figure 10).

The proposed beach renourishment and dredging operations *may affect North Atlantic right whales and the their critical habitat* because the species and a portion of the North Atlantic right whale critical habitat does occur within the proposed project area *but are not likely to adversely affect North Atlantic right whales or adversely modify their critical habitat* because; any dredging contract issued would include the special conditions mentioned above and listed below to ensure protection of whales and their critical habitats, no other species of whales besides North Atlantic right whales are expected to occur with regularity in the project area where the proposed dredging would occur and exhibit behaviors that would make them susceptible to ship collisions.

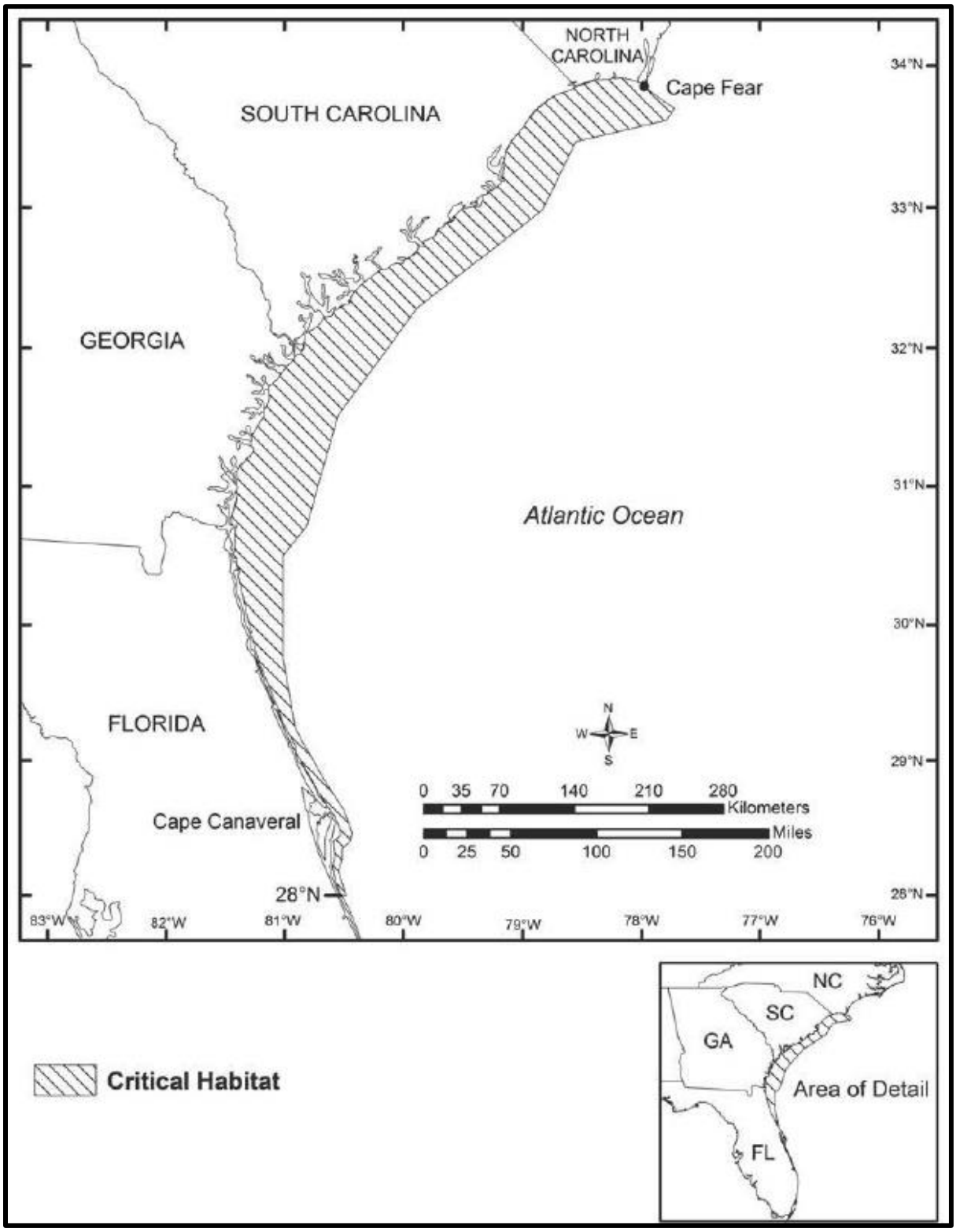


Figure 10: North Atlantic right whale critical habitat area representing the southeastern U.S. calving area.

- **Sea Turtles.**

Five species of threatened or endangered sea turtles are found along the Georgia coast. These include the Kemp's (Atlantic) Ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*), leatherback turtle (*Dermochelys coriacea*), loggerhead turtle (*Caretta caretta*), and Hawksbill turtle (*Eretomochelys imbricata*). Of these species only 2 have been known to nest on Tybee Island, the loggerhead and the leatherback. Further information can be found regarding sea turtles under the U.S. Fish and Wildlife Jurisdiction section above.

NMFS issued a final rule to designate critical habitat for the Northwest Atlantic Ocean Distinct Population Segment (DPS) of the loggerhead sea turtle (*Caretta caretta*) within the Atlantic Ocean and the Gulf of Mexico pursuant to the ESA of 1973, as amended in August 2014. Specific areas for designation include 38 occupied marine areas within the range of the Northwest Atlantic Ocean DPS. These areas contain one or a combination of habitat types: Nearshore reproductive habitat, winter area, breeding areas, constricted migratory corridors, and/or *Sargassum* habitat (Figure 8). Tybee Island is not included in the listing and does not contain habitat which has been previously designated as being critical for the species' survival. However, Little Tybee Island is designated as LOGG-N-10 in the critical habitat registry for NMFS (Figure 11).

The proposed beach renourishment and dredging operations *may affect sea turtles and the loggerhead critical habitat* because the species and a portion of the loggerhead critical habitat does occur near the proposed project area *but are not likely to adversely affect sea turtles or adversely modify loggerhead critical habitat* because any dredging contract issued would include the special conditions mentioned above and listed below to ensure protection of sea turtles (USACE, 1998). The 1997 National Marine Fisheries Service (NMFS) BO on hopper dredging in the southeast found that hopper dredging was much more likely than pipeline dredging to result in adverse impacts to sea turtles. Therefore, negative effects to sea turtles are not anticipated during dredging at the proposed offshore borrow site in association with the use of a hydraulic cutterhead pipeline dredge. To ensure that dredging operations are not likely to adversely affect sea turtles, all dredging operations would be done in compliance with the appropriate BO for navigation channels in the southeast issued by the NMFS. Informal consultation has been initiated with the USFWS in accordance with Section 7 of the ESA.

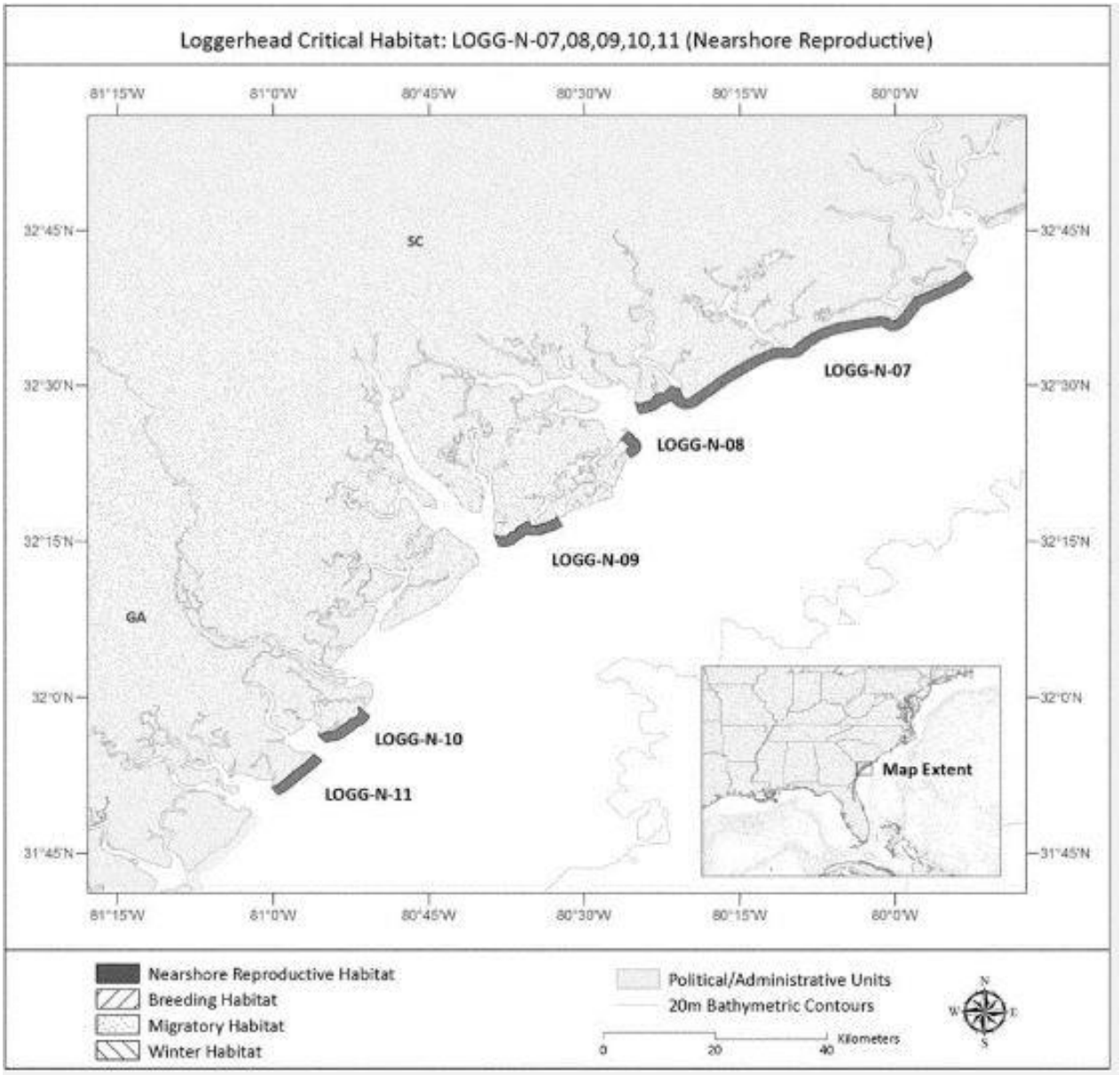


Figure 11: Loggerhead sea turtle critical habitat designation by NMFS.

- **Shortnose Stugeon.**

The shortnose sturgeon is an anadromous species restricted to the east coast of North America. They have been recorded from New Brunswick to Florida. Throughout its range, shortnose sturgeon occur in rivers, estuaries, and the sea. This species is known to occur in the Savannah, Ogeechee and Altamaha Rivers. The shortnose sturgeon is a suctorial feeder. The preferred prey is small gastropods (NMFS, 1984), but the species will feed on crustaceans, insect larvae, and mollusks (NMFS, 1995). Hall et al., 1991, mention the small clam *Corbicula* as being a possible prey item.

In the majority of the populations, the greatest abundance occurs in the lower portions of the estuary of their respective river systems (NMFS, 1984). They remain in the estuaries and at the interface of salt and freshwater until late winter, when they move upriver to spawn. The general pattern of seasonal movement appears to involve an upstream migration from late January through March when water temperatures range from 9°C to 12°C. Post-spawning fish begin moving back downstream in March and leave the freshwater reaches of the river in May. Juvenile and adult sturgeon use the area located 1 to 3 miles from the freshwater/saltwater interface throughout the year as a feeding ground. During the summer, this species tends to use deep holes at or just above the freshwater/saltwater boundary (Flournoy et al., 1992, Rogers and Weber, 1994, Hall et al., 1991).

The proposed beach renourishment and dredging operations *may affect shortnose sturgeon* because the species may occur near the proposed project area *but are not likely to adversely affect shortnose sturgeon* because; eggs and larvae would be expected to be found well upstream and would not be expected to be impacted by the project, juvenile shortnose sturgeon spend their first year in the upper freshwater reaches of the estuary, no shortnose sturgeon larvae (including ichthyoplankton and ichthyofauna) were found during a 2-year study in 2000 in the Savannah River estuary (Jennings and Weyers 2003) and no indication has been found that the shortnose sturgeon frequents barrier island beaches.

- **Atlantic Sturgeon.**

The Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) was listed as endangered on February 6, 2012 by NMFS. This listing applies to the South Atlantic and Carolina population segment (one of 5 Distinct Population Segments (DPS) off the US East Coast). This anadromous fish resembles the Shortnose sturgeon, with the most distinguishing physical differences being a longer more pointed snout and a larger maximum size. Atlantic sturgeon spawn in freshwater but primarily lead a marine existence.

The South Atlantic DPS includes all Atlantic sturgeon that spawn or are spawned in the watersheds (including all rivers and tributaries) of the Ashepoo, Combahee, and Edisto River (ACE) Basins southward along the South Carolina, Georgia, and Florida coastal areas to the St. Johns River, Florida. Rivers known to have current spawning populations within the range of the South Atlantic DPS include the Combahee, Edisto, Savannah, Ogeechee, Altamaha, and Satilla Rivers. NOAA has determined spawning was occurring if young-of-the-year were observed, or mature adults were present, in freshwater portions of a system. However, in some rivers, spawning by Atlantic sturgeon may not be contributing to population growth because of lack of suitable habitat and the presence of other stressors on juvenile survival and development. It has been clear that the various river systems are utilized by the South Atlantic DPS of Atlantic sturgeon for specific life functions, such as spawning, nursery habitat, and foraging. On August 17, 2017, NMFS designated areas in each of the distinct population

segments of Atlantic sturgeon as critical habitat (Figure 12). NMFS designated these areas because they protect spawning locations, rearing areas, water quality, and water quantity necessary for Atlantic sturgeon survival.

As stated in the 2017 Amendment to the Biologist Opinion for the Savannah Harbor Expansion Project, prior to the collapse of the fishery in the late 1800s, the sturgeon fishery was the third largest fishery in Georgia. Secor (2002) estimated from U.S. Fish Commission landing reports that approximately 11,000 spawning females were likely present in Georgia and 8,000 adult females were present in South Carolina prior to 1890. The Altamaha River population of the South Atlantic DPS, with an estimated 343 adults spawning annually, is believed to be the largest remaining population in the Southeast, yet is estimated to be only 6% of its historical population size. The abundances of the remaining river populations within the South Atlantic DPS, each estimated to have fewer than 300 annually spawning adults, are estimated to be less than 1% of what they were historically (ASSRT 2007). The NEAMAP model estimates a minimum ocean population of 14,911 South Atlantic DPS Atlantic sturgeon, of which 3,728 are adults.

Adult and juvenile sturgeons are believed to be very mobile, even when occupying resting areas during the summer months (deep holes and other deep areas). Based on the current understanding of the different dredging operations relative to sturgeon behavior, clamshell and hydraulic cutterhead dredges are still considered by NMFS as alternative dredge types to reduce potential entrainment impacts to sturgeon (NMFS, 1998). The 1995 NMFS BO on beach renourishment activities in the southeastern U.S. from North Carolina through Florida East Coast states "A formal consultation conducted on dredging and beach nourishment operation from North Carolina through Cape Canaveral, Florida, in 1991, and incorporated by reference, concluded that clamshell and pipeline dredges were not likely to adversely affect listed species. There is no new information to change the basis for that finding."

The proposed beach renourishment and dredging operations *may affect Atlantic sturgeon* because the species may occur near the proposed project area *but are not likely to adversely affect Atlantic sturgeon or adversely modify their critical habitat* because; it is not expected that Atlantic sturgeon would commonly use habitats, open nearshore ocean, where the project's activities would be performed, no impacts to sturgeon eggs or larvae are expected and the proposed work is not happening in Atlantic sturgeon critical habitat.

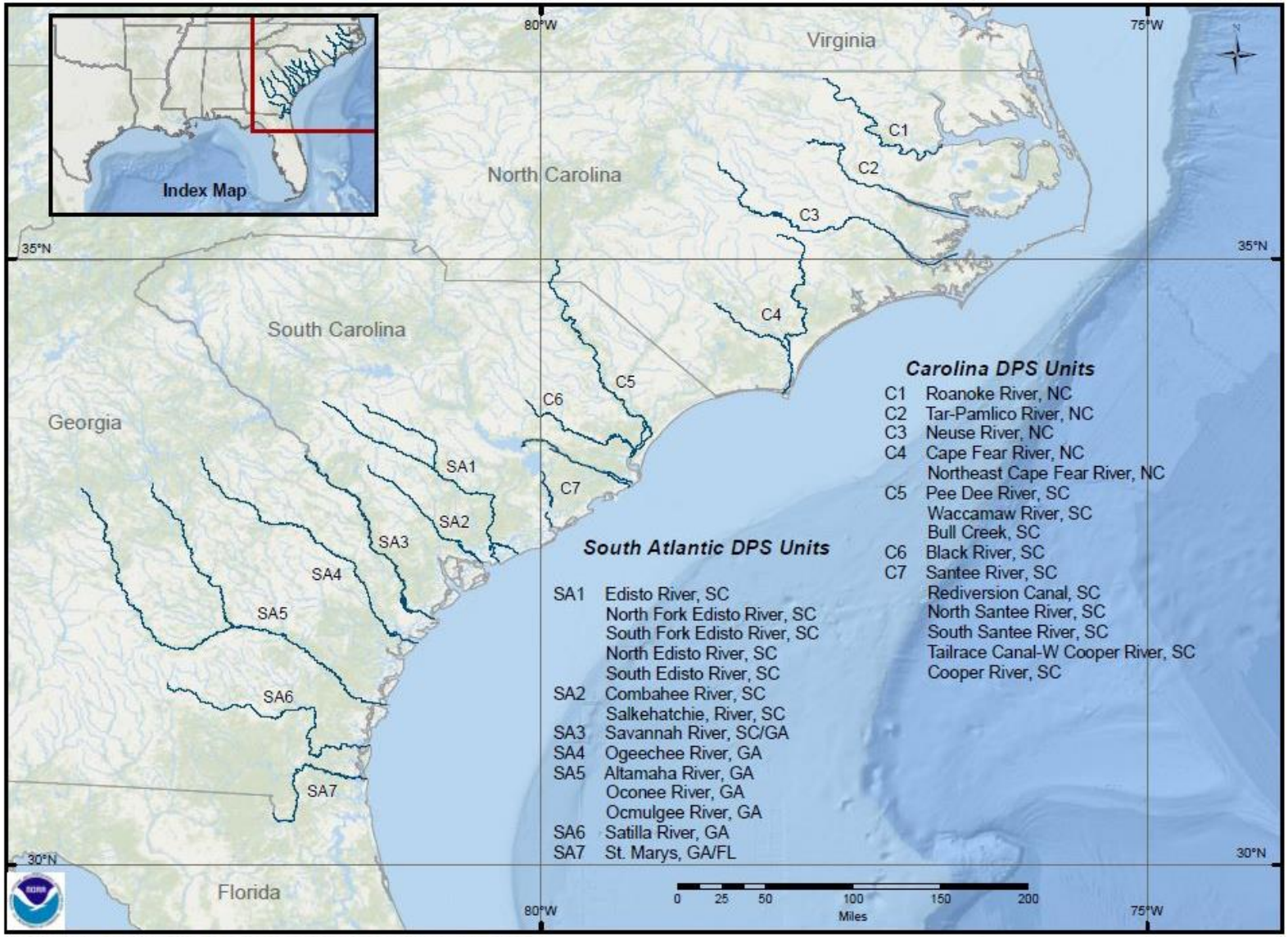


Figure 12: Atlantic Sturgeon critical habitat rivers in the Southeast U.S.

*Special Conditions*

To ensure that the proposed work would not impact whales, manatees, sea turtles, sturgeon, red knots or piping plovers, special conditions would be added to any contract issued. These conditions are described below.

1. Invasive Species Prevention Plan. U.S. Department of Agriculture (USDA) USDA Quarantine Requirements for Cleaning Equipment. USACE and the USDA have a compliance agreement requiring measures to prevent the spread of certain plant pests that may be present in the soil (ER 1110-1-5). Major portions of all southeastern states are in a quarantine area for such pests, including the imported fire ant. In addition, adjacent states to the north have introduced infestations resulting from movement of soil from infested southeastern states. The Contractor shall thoroughly clean all construction equipment and tools at the previous job site in a manner that ensures that these implements are free from residual soil, egg deposits from plant pests, noxious weeds, and plant seeds. Equipment shall be cleaned using water under pressure, and hand tools shall be thoroughly cleaned by brushing or other means to remove all soil. In addition, all construction equipment used for this USACE contract shall be thoroughly cleaned by the Contractor before it is removed from this job site. The Contractor shall consult with the USDA jurisdictional office for additional cleaning requirements that may be necessary.

2. Piping plover, red knots, sea turtles, whales and the Florida manatee have been sighted in the general vicinity of the project. The Contractor shall maintain a special watch for these species for the duration of this contract for these animals and any sightings will be reported to the Contracting Officer.

3. Endangered Species Watch Plan. A watch plan (see sample, Attachment E-1) that is adequate to protect endangered species from the impacts of the dredging and associated operations must be approved by the Contracting Officer before any dredging activities take place. The watch plan shall be for the entire period of dredging and transportation of material from the borrow area to the beach project area and shall include the following:

    a. Watch plan coordinator's name
    b. Names and qualifications of designated observers
    c. Name(s) of the person(s) responsible for reporting sightings.

4. The contractor will instruct all personnel associated with the dredging and renourishing of the beach of the potential presence of piping plover, red knots, manatees, dolphins, sturgeon, whales, and sea turtles, and the need to avoid collisions with these species.

5. All personnel associated with the dredging and renourishing of the beach will be advised that there are civil and criminal penalties for harming, harassing, or killing piping plover, red knots, manatees, sea turtles, and whales which are protected under the Marine Mammal Protection Act of 1972, and or the ESA of 1973. The contractor may be held responsible for any manatee harmed, harassed, or killed as a result of project activities.

6. Siltation or turbidity barriers will be made of material in which manatees cannot become entangled, be properly secured, and be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

7. All vessels associated with the project will operate at "no wake/idle" speeds at all times while in the immediate area and while in the water where the draft of the vessel provides less than four feet clearance from the bottom. All vessels will follow routes of deep water whenever possible.

8. Extreme care will be taken in lowering equipment or materials, including, but not limited to pipelines, dredging equipment, anchors, etc., below the water surface to the ocean floor; taking any precautions not to harm any manatee(s) that may have entered the project area undetected. All such equipment will be lowered at the lowest possible speed.

9. To prevent a crushing hazard to manatees, if plastic pipeline is used to transport material from the borrow site to the beach the pipeline will be secured to the ocean floor or to a fixed object along its length to prevent movement with the tides or wave action.

10. Dredge lighting must be shielded, or low-sodium, to prevent potential disruption of courtship or nesting by sea turtles during 1 May through 30 August.

11. The contractor agrees that any adverse interactions with piping plovers, red knots, manatee, sea turtle, sturgeon, whales or any other threatened or endangered species shall be reported immediately to the Corps of Engineers (912-652-5058), the USFWS Coastal Suboffice (912-832-8739), and the GA DNR (Weekdays: 912-264-7218 or 1-800-241-4113; nights and weekends: 1-800-241-4113). Notification will also be made to the above offices upon locating a dead, injured, or sick endangered or threatened species specimen. Care will be taken in handling dead specimens to preserve biological materials for later analysis of cause of death. Any dead manatee(s) found in the project area must be secured to a stable object to prevent the carcass from being moved by the current before the authorities arrive. The finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed. In the event of injury or mortality of a manatee, all aquatic activity in the project area must cease pending section 7 consultation under the ESA between the USFWS and the Corps of Engineers.

12. All on-site project personnel are responsible for observing water-related activities for the presence of manatee(s). All in-water operations, including vessels, must be shutdown if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

13. A minimum of two 3-feet by 4-feet temporary manatee awareness construction signs labeled "Manatee Habitat-Idle Speed In Construction Area" shall be installed and maintained at prominent locations within the construction area/docking facility prior to initiation of construction and removed upon completion of the project. One sign shall be placed visible to vessel operators and one shall be visible to water related dredging crews. See Attachment EA-4 Temporary Manatee Awareness Construction Signs.

14. Prior to each renourishment cycle, the Savannah District shall coordinate with the USFWS to review sea turtle nest records for Tybee Island and other pertinent data to determine if Section 7 consultation should be reinitiated.

15. The contractor will keep a log detailing sightings, collision, or injury to piping plover, red knots, manatees, sea turtles, sturgeon, whales, or other endangered species which have occurred during the contract period. Following project completion, a report summarizing the above incidents and sightings will be submitted to the USFWS, 4980 Wildlife Dr. NE, Townsend, Georgia 31331, to the GA DNR, Nongame Conservation Section, 1 Conservation Way, Brunswick, GA 31520, and to the U.S Army Corps of Engineers, Savannah District, Navigation Section, ATTN: CESAS-OP-SN, 100 W. Oglethorpe Ave., Savannah, Georgia 31401-3640.

16. All temporary project materials will be removed upon completion of the work. No construction debris or trash will be discarded into the water.

17. Shorebird monitoring will be conducted prior to and during construction activities in the vicinity of critical habitat unit GA-1 for piping plovers. A 200 foot buffer zone will be established around feeding piping plovers and red knots. If necessary, construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. Any construction related activities that could potentially harass feeding piping plovers or red knots shall cease while piping plovers and red knots are in the buffer zone. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall also be considered if birds appear agitated or disturbed by construction related activities.

**5.0 Quality of Dredged Material.**

Sediment testing was performed in the project area especially within the expanded borrow area to assess the potential for contaminant-related environmental impacts from the dredged material. The dredging material did not contain contaminants at an unacceptable level (see EA, Section 2.2.6).

**6.0 Project Timing.**

The project is proposed for construction beginning in November 2019 and completing in April 2020. However, various circumstances may occur which delay project implementation or completion.

**7.0 Coordination.**

In August 1995, the NMFS released a Regional BO covering dredging which includes beach renourishment projects. As a result, the proposed project is currently covered for Section 7 ESA under the existing NOAA/NMFS South Atlantic Regional Biological Opinion (SARBO). In July 2008, USFWS issued a new BO for this project on piping plovers and their critical habitat Unit-GA-1, and nesting loggerhead and leatherback sea turtles. This BATES incorporates the conditions included in those opinions.

This BATES will be submitted to the NMFS and the USFWS for review and comment during public review period of the draft EA.

**8.0 Determination.**

Based on the above evaluation, it is expected that the proposed project for Tybee Island Shore Protection as proposed in the EA and as outlined in this document will not have significant adverse impacts on these species provided the conditions listed below for the protection of manatees, right whales, piping plovers, red knots, sturgeon and sea turtles are made as a part of the dredging contracts:

a. The contractor will instruct all personnel associated with the dredging and construction of the presence of manatees, right whales, sturgeon and sea turtles and the need to avoid collisions with these species.

b. All personnel associated with the dredging and construction will be advised that there are civil and criminal penalties for harming, harassing, or killing manatees which are protected under the ESA of 1973 and the Marine Mammal Protection Act of 1972. The contractor may be held responsible for any manatee harmed, harassed, or killed as a result of construction activities.

c. Any collision with a manatee will be immediately reported to the Corps of Engineers' Contracting Officer's Representative (912-652-6086), the USFWS

Coastal Suboffice (912-832-8739), and the GA DNR (weekdays 8:00 a.m. - 4:30 p.m.; 912-264-7218 or 1-800-272-8363; nights and weekends: 1-800-241-4113).

d. All construction activities in open water will cease upon the sighting of manatees within 50 yards of the project area. Construction activities will not resume until the manatee has not been seen in the project area for at least 30 minutes. Upland construction activities will not be required to cease in the event of a manatee sighting.

e. The contractor will keep a log detailing sightings, collisions, or injury to manatees which occur during the dredging operations.

f. A report summarizing the above incidents will be provided to the Savannah District for coordination with the USFWS, 4980 Wildlife Dr. NE, Townsend, Georgia 31331.

g. All vessels associated with the project will operate at "no-wake" speeds at all times while in the water where the draft of the vessel provides less than four feet of clearance from the bottom and that vessels will follow routes of deep water to the extent possible.

h. The contractor will instruct all personnel associated with the dredging of the presence of Right Whales and the need to avoid collisions with these mammals. The contractor should also brief all personnel on the habits and behavior of the Right Whale.

i. The contractor shall restrict vessel speeds during the high risk season of December to March of each year such that collisions with adult or juvenile whales can be avoided.

j. The contractor shall be required to post a whale watch and submit a whale watch plan prior to conducting any dredging activities at the site. These measures apply to the dredge and any attendant vessel associated with the dredging activity with a length of over 20 feet.

k. Shorebird monitoring will be conducted during construction activities in the vicinity of critical habitat unit GA-1 for piping plovers. A 200 foot buffer zone will be established around feeding piping plovers and red knots. If necessary, construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. Any construction related activities that could potentially harass feeding piping plovers or red knots shall cease while piping plovers and red knots are in the buffer zone. Surveys to detect piping plovers and red knots or concentrations of other wintering or migratory shorebirds would begin prior to construction commencement and be conducted once every two weeks by the Contractor through April 30, or the end of construction, whichever

comes first. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall also be considered if birds appear agitated or disturbed by construction related activities.

l. Each dredging and construction contract for the Tybee Island Shore Protection Project will contain the following provisions:

1. Each contractor will be required to instruct all personnel associated with the dredging/construction project about the possible presence of endangered right whales, manatees, sturgeon and sea turtles in the area and the need to avoid collisions. Each contractor will also be required to brief his personnel concerning the civil and criminal penalties for harming, harassing or killing species that are protected under the ESA of 1973 and the Marine Mammal Protection Act of 1972.

2. Dredges and all other disposal and attendant vessels are required to stop, alter course, or otherwise maneuver to avoid approaching the known location of an endangered species.

3. The contractor will be required to submit an endangered species watch plan that is adequate to protect right whales, manatees, and sea turtles from the impacts of the proposed work. This plan will include provisions on board the dredge and all attendant vessels of trained observers ( in accordance with the NMFS Regional Opinion) to watch for right whales at all times the vessel is in motion. Observers would be required during those months when these species may be expected to be present in the area.

4. Contractors will be required to use daily available information on the presence of right whales, manatees, and sea turtles in the project area. The dredge operator must take necessary precautions to avoid whales. During evening hours or when there is limited visibility due to fog or sea states of greater than Beaufort 3, the dredge and attendant vessels must slow down to five knots or less when transiting between areas if whales have been spotted within 15nm of the vessel's path within the previous 24 hours. If a right whale is known to be within 15 nautical miles of the project area on a given day, dredges and any attendant vessels 20 feet or greater in length will be required to limit speeds that night to 5 knots or less when in the project area. The project area is defined as The Oceanfront Beach, South Tip Beach, Back River Beach, borrow area, and routes traveled between them.

5. If a Right Whale Early Warning System (RWEW) is in place, it will be used to provide adequate information on the presence of whales during dredging operations.

**9.0 References.**

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# BATES

# Attachment EA-1

# Endangered Species Watch Plan

# Tybee Island, Georgia Shore Protection Project 2019 Renourishment

# SAMPLE WATCH PLAN FOR ENDANGERED SPECIES

## NAME OF DREDGING COMPANY

## ENDANGERED SPECIES PROTECTION AND AWARENESS PROGRAM

## PROJECT NAME

**A. Purpose:** Protection of an endangered species (manatee, sea turtle, whale, bird, etc.) during dredging and disposal operations for the above project.

**B. Education of employees:** Prior to initial work, job site meetings will be conducted by an environmental consultant, who will familiarize all employees with the habits and habitats of the locally found endangered species, together with detailed instructions and procedures for reporting endangered species sightings. This environmental consultant shall be familiar with the endangered species listed in paragraph D below and Federal regulations regarding their protection. Additional meetings will be conducted by an onsite coordinator as needed.

**C. Awareness:** In order to provide a continuous reminder to employees of the endangered species program, graphics will be displayed about the operating equipment and employees provided with a visual display.

**D. Watch Plans:** A watch plan that is adequate to protect endangered species from the impacts of dredging must be approved by the Contracting Officer and used during know times of endangered species presence. This plan shall be submitted for approval prior to the pre-construction conference. The watch plan should cover an area adequate to protect the endangered species from impacts associated with all types of dredging activities (i.e., dredging, disposal, blasting, etc.). All activities should stop when an endangered species is in the impact zone and not resume until the species is no longer in the impact zone. Surveillance is mandatory for the following species which are most likely to be present during the following times:

**Right Whales**----------September through April
**Manatees**----------March through December
**Sea turtles**----------April through December
**Piping plovers**----------August through April
**Red Knots**----------August through April

Surveillance must be conducted to whatever extent (aerial, waterborne, etc.) necessary to detect the endangered species.

**E. Reports:** All sightings must be reported immediately to the dredge inspector within 24 hours of the sighting. Additionally, all sightings must be included in the daily report. Following completion of the project, copies of the daily reports with sightings shall be forwarded to the U.S. Army Corps of Engineers, Dredging Section, ATTN: CESAS-OP-NN, U.S. Army Engineer District, 100 W. Oglethorpe Avenue, Savannah, GA 31401-3640. All of the reports must be dated and signed by the Contractor or his/her representative including the name of the person making the sighting.

**F. Submittals:** The Contractor shall submit the Endangered Species protection and Awareness Program in the above format to the Contracting Officer for his/her approval before work is commenced in the times identified in Item D above. The submittal must identify the program's coordinator, surveillance personnel, and who will be responsible for reporting sightings.

## ENDANGERED SPECIES SIGHTING INFORMATION

**Date and Time:**

**Weather Conditions:**

**Oceanographic Conditions:**

**Location:**

**Species and Reliability of I.D. (sure, unsure):**

**Number of Animals:**

**Associated Organisms:**

**Characteristics Observed Which Resulted in Species Identification:**

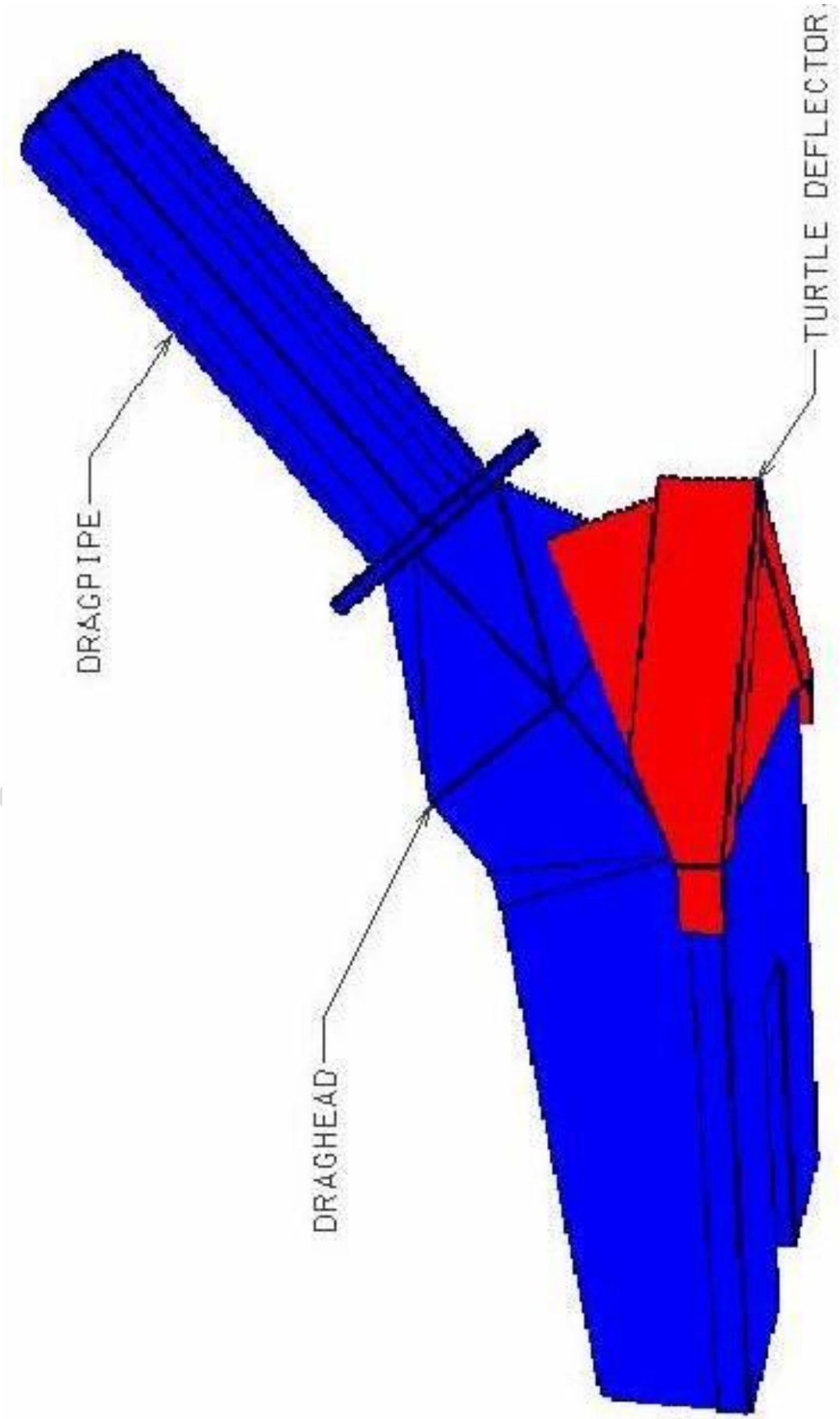
**Behavior of Animals:**

**Photos Available:**

**Send to US Department of Commerce, NOAA**
**National Marine Fisheries Service**
**9450 Koger Boulevard**
**St. Petersburgh, FL 33702**
**ATTN: F/SEP 23**

**Additional Remarks:**

**Name and Address of Observer (Ship or A/C):**


DRAGPIPE
DRAGHEAD
TURTLE DEFLECTOR

Endangered whale species, from top to bottom: northern right, southern right, humpback, blue, fin, sei and sperm

## Identification Guide

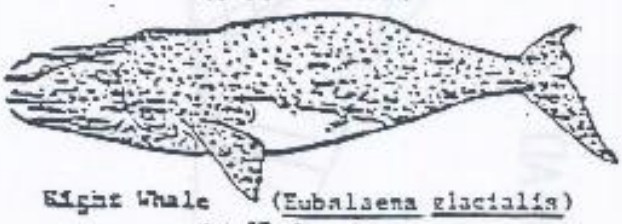
Sperm Whale (Physeter catodon) to 69 ft. long

Blue Whale (Balaenoptera musculus)
to 85 ft. long

Sei Whale (Balaenoptera borealis)
to 62 ft. long

Fin Whale (Balaenoptera physalus)
to 79 ft. long

Humpback Whale (Megaptera novaeangliae)
to 53 ft. long



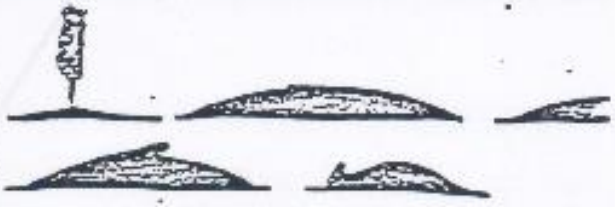
Right Whale (Eubalaena glacialis)
to 53 ft. long

## Diving Behavior

Sperm Whale

Blue Whale

Sei Whale



Fin Whale

Humpback Whale

Right Whale

## Whale Descriptions

**Right.** Rotund body without dorsal fin; distinctive bumps (callosities) on top of head; color black, brown or mottled with white region on chin and belly. Southern species almost indistinguishable from Northern but may be slightly larger and have minor differences in skull shape.

**Humpback.** Long nearly white flippers; lumpy dorsal fin; protuberances randomly distributed on the top of the head and lower jaw; distinctive patterns on flukes; color black with white region on belly.

**Blue.** Broad lat U-shaped head with single ridge from in front of paired blowholes almost to tip of snout; very small dorsal fin (13 inches tall); color bluish and often mottled.

**Fin.** Dorsal fin up to 24 inches tall located slightly more than 1/3 forward from tail; black on right side of lower jaw and white on the left; color dark gray to brownish gray.

**Sei**. Differs from other baleens by the very fine bristles (baleen); color dark steel gray on back and sides; often has a shiny or galvanized appearance due to ovid scars.

**Sperm**. Teeth in lower jaw; hump and ridges instead of dorsal fin; single blowhole to left of midline; large blunt head comprising 1/4 to 1/3 of total body; color bluish black.

NOTE - Whenever possible take photographs of your sightings. For right whales, photographs of the callosities on the snout are important because they allow individuals to be differentiated. Photographs of the flukes of humpback whales also allow for identification of individuals.

# BATES

# Attachment EA-2

# City of Tybee Lighting Code

# Tybee Island, Georgia Shore Protection Project 2019 Renourishment

**City of Tybee Lighting Code Sea Turtle Nesting Season 1 May through 31 October**

Sec. 3-230. Turtle nesting protection.

The beaches of Tybee Island serve as a prime nesting site for sea turtles, an endangered species. Coastal development threatens the survival of sea turtles because artificial lighting discourages nesting females and causes disorientation of hatchlings during the nesting season, which runs from May 1 through October 31 each year. It is the intention of the city to offer protection to these endangered sea turtles by providing standards for lighting in the shore protection area adjacent to the city's beaches. For the purposes of this section, the protected nesting area shall be the sand beaches of Tybee Island.

(A) Exceptions. The following point sources of artificial light are exempt from the provisions of this section:

(1) All lights necessary for the safe navigation of vessels utilizing the waters surrounding the city;

(2) All lights necessary to mark obstructions to the safe use of airspace over, above and around the city;

(3) All lights necessary for regulating the safe passage and movement of vehicular and pedestrian traffic within the city;

(4) Any light that has been specifically designated by the fire and/or police commissioner(s) as necessary for the security and safety of the human inhabitants of the city.

(B) New development. Building and electrical plans for new construction including parking lots, dune crossovers, and all other outdoor lighting that can be seen from the beach shall comply as follows:

(1) Floodlights shall be shielded and mounted so that no light illuminates the beach and the point source of light is not visible from the breach.

(2) Pole lighting shall be shielded and mounted so that light is directed away from the seaward side of the pole and the point source of light is not visible from the beach.

(3) Low profile luminaries shall be positioned so that no light shines directly onto the beach.

(4) Dune crossovers shall utilize low profile shielded lighting so that no light illuminates the beach and the point source of the light is not visible from the beach.

(5) Lights illuminating buildings and grounds shall be shielded or screened so that they do not illuminate the beach and the point source of light is not visible from the beach, or they shall be turned off from sunset to sunrise during the period of May 1 through October 31 of each year.

(6) Temporary security lights at construction sites shall not be mounted higher than 15 feet above ground and shall be positioned not to illuminate the beach.

(C) Existing development. All lighting shall come into compliance with the following standards:

(1) Lights illuminating buildings and grounds shall be shielded or screened so that they do not illuminate the beach and the point source of light is not visible from the beach, or they shall be turned off from sunset to sunrise during the period of May 1 through October 31 of each year.

(2) Lights illuminating crossovers shall be shielded or screened so that they do not illuminate the beach and the point source of light is not visible from the beach, or they shall be turned off during the period of May 1 through October 31 of each year.

(3) Security lighting shall be shielded or screened so that the beach is not illuminated and the point source of light is not visible from the beach, or low profile luminaries may be used.

(D) Publicly owned lighting. Streetlights and lighting of publicly owned beach access areas must be in compliance with the following:

(1) Wherever possible, streetlights shall be located, shielded or shaded so that they will not directly illuminate the beach and the point source of light is not visible from the beach.

(2) Lights at parks or other public beach access points shall be shielded or shaded so that they will not directly illuminate the beach and the point source of light is not visible from the beach or, if not necessary for security or public safety, utilization may be discontinued during the nesting season.

# BATES

# Attachment EA-3

# Turtle Monitoring Program



# Tybee Island, Georgia Shore Protection Project 2019 Renourishment

# DRAFT SCOPE OF WORK FOR MONITORING SEA TURTLE NESTING TYBEE ISLAND, GEORGIA

1. Purpose: The City of Tybee Island, in cooperation with the Georgia Department of Natural Resources, will monitor loggerhead sea turtle nesting efforts on Tybee Island. A monitoring program is necessary due to the Tybee Island Shore Protection Project 2019 Renourishment. Sediment from an offshore borrow area will be placed along the beaches of Tybee Island, Georgia. The entire construction area on the island will be monitored. Construction is scheduled to be completed by 1 May to avoid impacts to nesting turtles. All nests, false crawls and strandings will be recorded and nest relocations, if necessary, will be performed within 6 hours of the completion of the daily patrol. Monitoring under this work activity will commence on 1 May and will continue on a daily basis through the end of the nesting season, 30 August. Any unhatched nests remaining on the beach after the end of the nesting season will continue to be monitored to determine hatching success and orientation of emerging hatchlings. Currently the Tybee Island Marine Science Center (TIMSC), in collaboration with GA DNR, runs the sea turtle nest protection and management program and will continue to monitor sea turtle nesting in 2019/2020. The remainder of this document contains a sample sea turtle monitoring plan only and should not be used in place of TIMSC/DNR protocols.

2. Work Efforts: The following work efforts will be undertaken as a part of this activity:
    a. Patrol of the survey area will be made at sunrise each morning from 1 May through 30 August. The survey area incorporates all the ocean beach construction areas. It will be the responsibility of the surveyor to clear the use of survey vehicles with applicable State agencies and local authorities.

b. A daily log sheet (attached) will be completed for each day. All applicable parts of the log sheet should be completed.

c. Should a stranded sea turtle be encountered on the beach, a stranding form (attached) will be completed. If any species of stranded sea turtle is encountered, the Georgia sea turtle coordinator, Mr. Mark Dodd, Georgia Department of Natural Resources, Coastal Resources Division, will be contacted immediately (1-800-2-SAVE-ME (1-800-278-2969)).

d. A turtle nest data sheet (attached) will be completed for all turtle nests found. The locations of all nests discovered during the beach monitoring program will be carefully described and recorded in relation to existing structures. A wooden stake, marked with the nest number and date, will be placed a know distance landward of the nest. A map showing the nest location will be sketched on the back of the nest data sheet.

e. All nests which are located in the disposal area or within 500 feet of the limits of the disposal area which are likely to be impacted by future disposal and /or related construction activities will be relocated to an undeveloped portion of the beach north of the disposal site. This includes nests which are laid in the disposal area and are located so the nest is likely to be destroyed by erosion prior to hatching. All relocated nests will be staked as described in paragraph “d” above. Relocations will be conducted in accordance with the attached guidelines.

f. Efforts should be made to obscure evidence of loggerhead nesting where desirable and practicable. Tracks of crawls leading to a nest are best erased by sweeping or kicking sand. If questioned by onlookers, the nesting surveyor will state that he/she is performing environmental surveys associated with beach disposal operations.

g. Nests will be observed daily to monitor disturbance and predation. When nests show sign of emergence, the sand around the nests will be smoothed to improve observations of hatchling tracks. For those nests where hatchling tracks can be distinguished, the number and orientation of

hatchlings which emerged from the nest will be determined and enumerated. If hatchlings are disoriented, an effort will be made to identify lights which appear to have caused disorientation.

h. Nests will be excavated 3 days following signs of emergence or 65 days following deposition to determine hatchling success. The number of unhatched eggs, egg shells, and dead hatchlings will be determined and recorded.

3. Reporting: In addition to the reporting requirements mentioned above, a report of findings which incorporates the daily log sheets, stranding forms, turtle nest data sheets and other pertinent field data will be prepared and furnished to the Savannah District within 4 weeks of the completion of beach nourishment. If necessary; a revised report will be furnished to the Savannah District within 2 weeks of receipt of any District comments on the original report.

4. Schedule: The City of Tybee Island will be on site at sunrise on or about 1 May and will monitor daily through 30 August for each year. Relocation of nests within the impact area will continue until the nesting season is completed or on 30 August. Nest monitoring will continue until all nests have been hatched or until 65 days after the nest was laid.

# GEORGIA DEPARTMENT OF NATURAL RESOURCES MARINE TURTLE NEST DATA REPORT

Name:_____
Date:_____

Island:_____

Nest #:_____ Date of Deposition:_____

Description of Location (GPS Coordinates if available):

Predated: Y or N Date of Predation:_____ % Destroyed:_____

Type of Predator:_____

Date of First Emergence:_____ Date Excavated:_____

# Eggs:_____ # Hatched_____ # Dead or Deformed_____

Remarks:

**PLEASE PRINT CLEARLY AND FILL OUT ALL APPLICALBLE BLANKS**

Use codes below. Measurements may be straight line calipers and/or over the carapace curve (tape measure). Measure length from the center of the nuchal notch to the tip of the most posterior marginal. Measure width at the widest point of carapace. CIRCLE THE UNIT USED. See diagram below. Please give a specific location description, include latitude and longitude.

Observer's Full Name_____ Stranding Date_____

Address/Affiliation_____

Phone number_____ Species_____Turtle # by Day_____

Reliability of ID: (circle one) Unsure Probable Positive
Species verified by State Coordinator? Yes or no

Sex: (circle one) Female Male Undetermined How was sex determined?

State_____ County_____
Location_____

Latitude_____
Longitude_____

Condition of Turtle (use codes)_____Final disposition of turtle_____

Tag number, including tag return address and position of tag:
_____
_____
_____



## CODES

**Species:**
CC= Loggerhead
CM= Green
DC= Leatherback
EI= Hawksbill
LK= Kemp's Ridley
UN= Unidentified

**Condition of Turtle:**
0= Alive
1= Fresh dead
2= Moderately decomposed
3= Severely decomposed
4= Dried Carcass
5= Skeleton, bones only

**Final Disposition of Turtle:**
1= Painted, left on beach
2= Buried on beach
3= Salvaged specimen
4= Pulled up on beach
5= Unpainted, left on beach
6= Alive, released
7= Alive, taken to a holding facility

**MEASUREMENTS: CIRCLE UNITS**

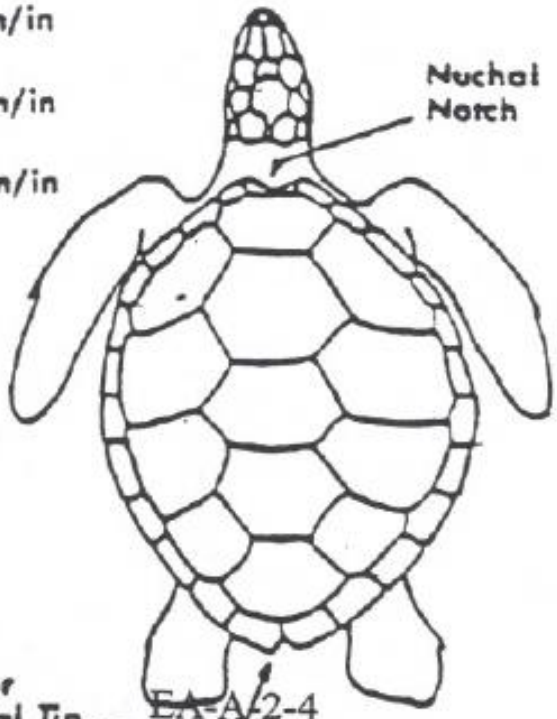
Straight Length _____ cm/in

Straight Width _____ cm/in

Curved Length _____ cm/in

Curved Width _____ cm/in

Mark wounds, abnormalities, and tag locations




EA-A2-4

Remarks: Note if turtle was involved with tar or oil, gear or debris entanglement, wounds or mutilations, propeller wounds/scars, papillomas, epizoa, barnacles, etc. Try to photograph turtle if possible.

CORPS OF ENGINEERS, SAVANNAH DISTRICT

GUIDELINES FOR SEA TURTLE NEST RELOCATION

Nests which are located in the disposal areas or within 500 feet of the limits of the disposal area which are likely to be impacted by future disposal and/or related construction activities must be relocated to the designated relocation area. Also, nests which are laid in the newly created beach in areas where they are likely to be destroyed by erosion before incubation is complete will be relocated. The following guidelines should be used:

1. Loggerhead eggs are frequently located on the seaward side of the nest, approximately one-half meter beneath the surface of the sand. Extreme care must be used in attempting to locate eggs. Eggs should be located by hand excavation whenever possible. A probe should be used only by experienced personnel and only after extensive digging by hand has failed to locate the nest (preferred probe would be dead spartina grass stem, or if not available, then a wood or metal rod about 0.75 centimeters in diameter and about 1 to ½ meters in length). If a probe results in broken eggs any broken eggs or spilled contents should be removed and discarded to prevent the clutch from rotting.

2. Once the eggs are located, excavate them by hand quickly and carefully. The size (depth, width, etc) of the nest chamber and its location in relation to the primary dune and high tide line should be recorded. Eggs should be placed in a rigid container on a layer of moist sand from the nest. The container should be large enough to allow for sand to “buffer” the eggs and the side of the container to prevent damage during transportation. Eggs should be shaded from the heat of the sun. Do not allow the eggs to become dry.

3. The hatching success of nests relocated within 6 hours of laying is higher than that for older nests. Efforts should be made to relocate nests as soon as possible after

laying, and care should be used in moving nests to maintain the axial orientation of the egg.

4. The relocation site should be located at a site which closely resembles the natural nest site (i.e. beach profile, relationship to the high-tide line and primary dune, etc.). A nest chamber should be excavated with shape and dimensions similar to that of the natural nest. (The pear shaped configuration of a natural nest can be most easily achieved by using posthole diggers to excavate the "neck" and then scraping out the egg chamber with a sea shell or other small digging implement). Once the eggs have been carefully placed in the chamber and the sand from the original nest put on top, the neck of the chamber should be filled and packed firmly.

5. A turtle nest data sheet should be completed for all relocated turtle nests. The locations of all original and relocated nest sites should be recorded by the method(s) described in the scope of work. The street addresses of residences of any structures used to describe the nest location should be recorded and utilized in the location map for each nest. A wooden stake, marked with the nest number and date, will be placed in a known distance landward of the nest.

# BATES

# Attachment EA-4

# Temporary Manatee Awareness Construction Signs

# Tybee Island, Georgia Beach Erosion Project 2019 Renourishment

**Attachment EA-4: Temporary Construction Signs**

**Approved Sign Suppliers:**

The signs are available through the companies listed below and may also be available from other local suppliers throughout the state. Permit/lease holders, marinas, and boat docking/launching facilities should contact sign companies directly to obtain pricing information and arrange for shipping and billing.

**Approved Suppliers of Manatee Signs:**

Grafix, Inc.
455 Montgomery Street
P.O. Box 1028
Savannah, GA 31402
Voice: 912-691-1117
Fax: 912-232-3845

Image Sign Company
785 King George Blvd., Bldg. 3
Savannah, GA 31419
Voice: 912-961-1444
Fax: 912-961-1499

Doug Bean Signs, Inc.
160 Dean Forest Rd
Savannah, GA 31408
Voice: 912-964-1900
Fax: 912-964-2900

Fendig Signs
411 Arnold Rd
St. Simons Island, GA 31522

Good & Associates
St. Simons Island, GA
(912) 638-7664

**Temporary Construction Sign**

# APPENDIX C

# STATE OF GEORGIA
# COASTAL ZONE MANAGEMENT DETERMINATION

## TYBEE ISLAND, GEORGIA
## SHORELINE PROTECTION PROJECT
## 2019 HURRICAN HARVEY, IRMA, MARIA
## EMERGENCY SUPPLEMENTAL RENOURISHMENT



## U.S. ARMY CORPS OF ENGINEERS
## SAVANNAH DISTRICT

## APRIL 2019

## COASTAL ZONE MANAGEMENT DETERMINATION

**Tybee Island Shoreline Protection Project, Georgia - 2019 Hurricane Harvey, Irma, Maria, Emergency Supplemental Renourishment**

### 1.0 INTRODUCTION

State federal consistency lists identify the federal agency, federal license or permit, and federal financial assistance activities that are subject to federal consistency review if the activities occur within a state's coastal zone pursuant to the applicable subparts of NOAA's regulations at 15 C.F.R. part 930. The following evaluation is prepared in accordance with the State of Georgia's Coastal Zone Management Program (CZM).

The authorized project consists of nourishment of 13,200 linear feet of beach between two terminal groins (referred to as Oceanfront Beach); construction of a groin field along 1,100 linear feet of shoreline from the southern terminal groin around the South Tip to the mouth of Tybee Creek (also known as Back River) including periodic nourishment (referred to as South Tip Beach); and construction of a groin field and nourishment of 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach; **Error! Reference source not found.**). The beach was last renourished in 2015 and repaired in 2018. In 2019, there will be 5 years left in the project life (i.e. Federal participation). The 2015 renourishment was intended to provide material to maintain the beach and guard from potential erosion through 2024. After hurricanes Matthew in 2016 and Irma in 2017, supplemental renourishment was conducted in 2018 to add material that was lost due to storm damage. The Borrow Area Extension of 2008 (BAE 08) was used for the 2008 and 2015 renourishments and the 2018 supplemental renourishment. BAE 08 has been exhausted, requiring an expansion of the borrow area.

Previous investigations have found that dunes within the federal footprint would protect the Federal investment, improve the storm protection benefits, decrease maintenance costs, and delay the need for subsequent renourishment projects (USACE 1988, USACE 1994). Historic erosion rates across the beach profile have shown high erosion in areas known as "hot spots" (Figure 2). The following is a quote from the Section 905(b) Study, dated Sept. 2004, "Since 1975, over 6.9 million cubic yards (cy) of sand have been placed along Tybee's shoreline. The net erosion rate estimated for the beach erosion control project is approximately 78,000 cy/yr. However, hot spots alone that occur primarily at Second Street lose over 125,000 cy/yr". These hot spots create areas that are vulnerable to storm surge - causing damage to infrastructure, existing dunes and breaches in the design template.


Figure 1: Tybee Island Shore Protection Project.

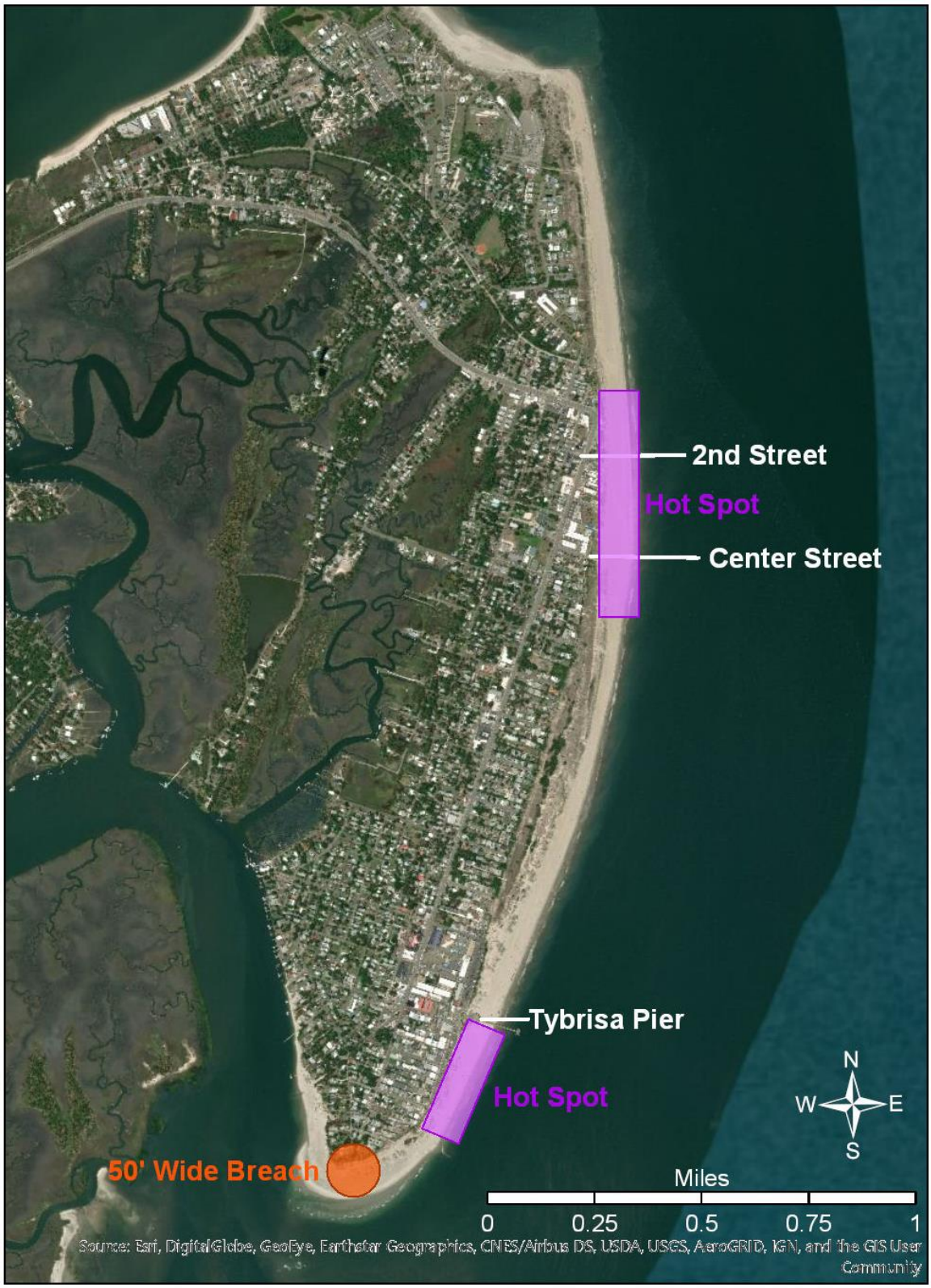



Figure 2: Tybee Island erosion hotspots.

## 2.0 PROPOSED ACTION

Project elevations for design and construction are established from NOAA tide gage Station 8670870 at Fort Pulaski, GA and based on Mean Lower Low Water (MLLW) in accordance with ER 110-2-8160 and EM 110-2-6056. Conversion from MLLW to NAVD88 at Station 9670870: +0' MLLW = +4.05' NAVD88.

As proposed, the project will be constructed using a hydraulic cutterhead pipeline dredge and support equipment. A submerged pipeline will extend from the borrow site to the southerly tip of Tybee Island. Submerged pipeline shall rest on the ocean bottom and will not move. Shore pipe will be progressively added to perform fill placement along the shorefront or creekfront areas to be renourished. Temporary toe dikes will be utilized in a shore parallel direction to control the hydraulic effluent and reduce turbidity. The sand will be placed in the form of varying design templates based upon longshore volumetric fill requirements which reflect beach conditions at the time of construction. Additional beach fill will be strategically placed in areas of documented highest erosional stress such as the 2nd Street "hot spot". Existing dunes are minimal in the hot spot areas.

The proposed sand source for this renourishment is the borrow area extension. The original borrow area is located approximately 4,000 feet southeast of the southernmost Federal terminal groin. Figure 3 shows the location of the borrow area with the borrow area extension. The Northwest facing side of the 2019 borrow location extension is ~3,090 ft (long edge toward Tybee). The Northeast facing side of the 2019 borrow location extension is ~6,800 ft (long edge facing the Savannah River navigation channel). The East facing side of the 2019 borrow location extension is ~7,160 ft (long edge facing the ocean.) The total area of the 2019 proposed borrow area extension is ~625 acres. Total area of the 2015 borrow area was ~213 acres. Total area of the 2008 borrow locations was ~256 acres. Total of yellow "original borrow area limits" was ~290 acres. The total area of the whole borrow area, including the extension, is ~1,340 acres.

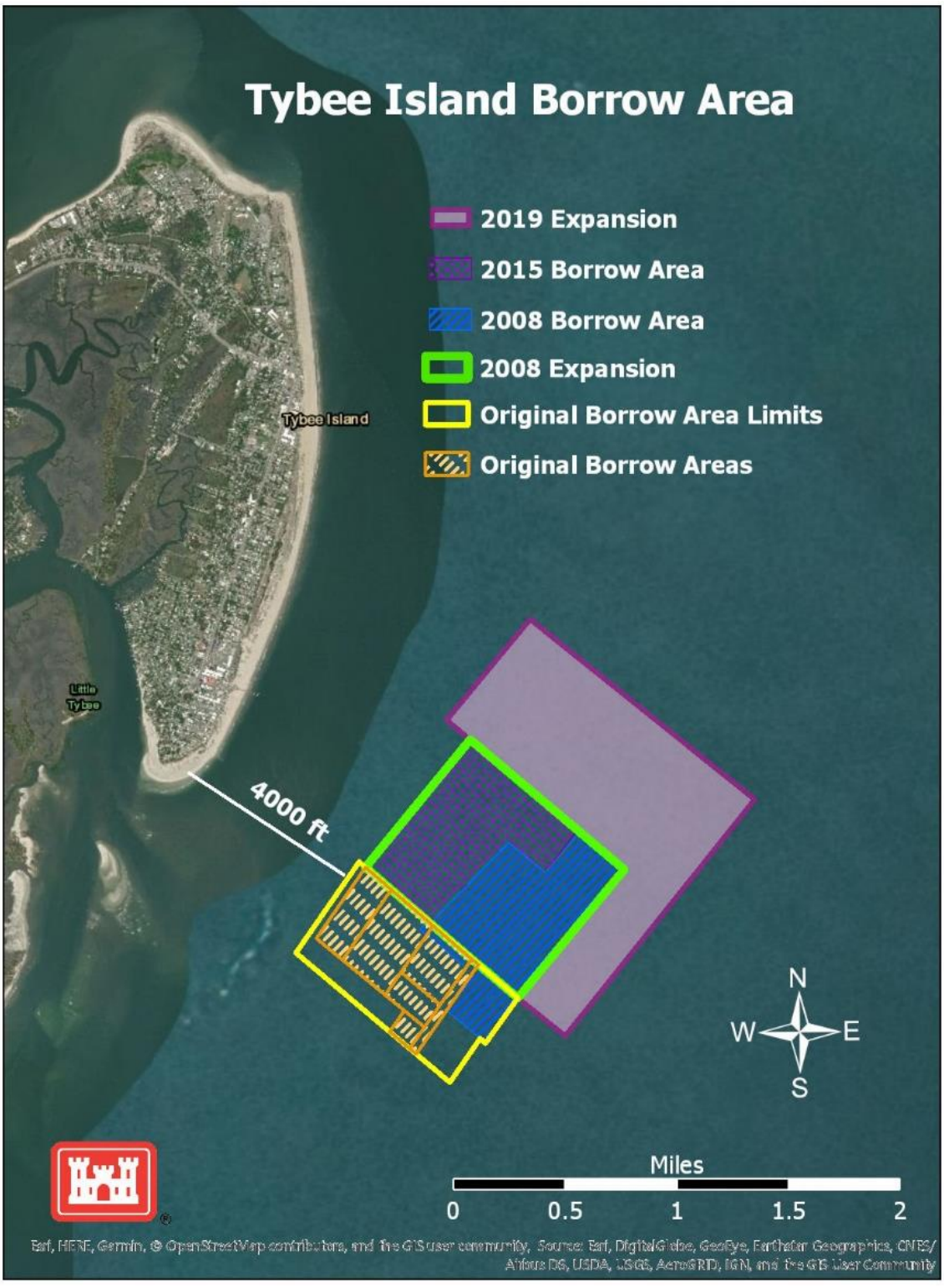



Figure 3: Tybee Island borrow area history and planned expansion.

The chosen alternative's proposed project template design is based on project performance and erosion rates since the last renourishment project in 2018, the calculated storm damage, and the proposed dune construction sites. Areas include the North Beach (North End Groin to Oceanview Court), Second Street area (Oceanview Court to Center Street), Middle Beach (Center Street to 11th Street), South Beach (11th Street to South End Groin), and the South Tip Groin Field. Additional fill will be placed between these areas to provide a more stable beach profile and to avoid some of the excessive losses in the 2nd Street "hot spot" from project end losses and offshore losses that resulted from the wide beach constructed at this location during the last renourishment. Beach widths on the Oceanfront Beach will vary from a 25-foot width berm, to a berm approximately 350 feet wide at the elevation of +11.2 MLLW. Based on natural angle of repose on the existing beach, and experience with previous placement, a beach slope of 1 vertical on 25 horizontal will be required on the oceanfront beach (Figure 4).

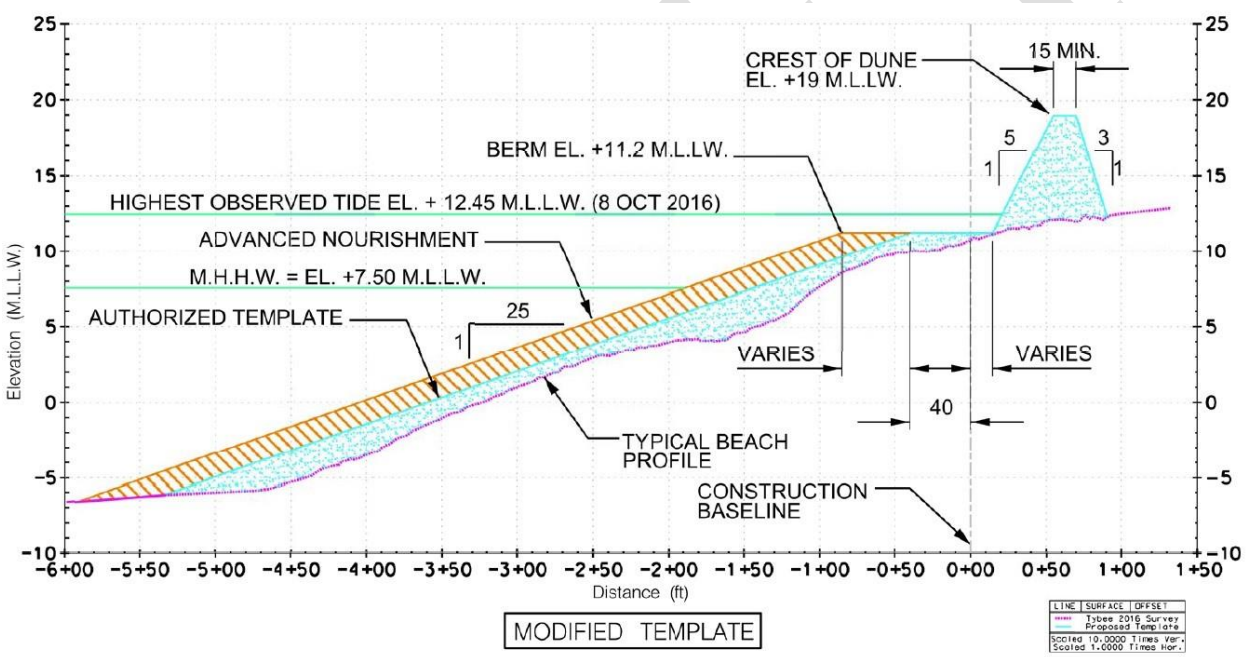



Figure 4: Tybee Island Modified Template.

Incorporation of existing dunes within the federal project would include approximately 9,500 linear feet of existing dunes meeting the requirements of the modified template along the Front Beach renourishment area. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. Existing dunes in the federal project are shown in Figure 5 in orange.

Recommended dune construction within the federal project includes 3,700 linear feet of the Front Beach renourishment area addressing hot spots (Figure 5; blue shaded area). In addition, approximately 1,100 linear feet along the South Tip renourishment area would be considered for dune construction in order to rebuild dunes to meet the

requirements of the recommended template. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. The recommend dune portion of the template will use a 1:5 slope on the seaward side of the dune and a 1:3 slope on the landward side of the dune based off of the field data collected. Dune crest height of +19' MLLW is recommended to protect against storm surge with a 1% exceedance probability while taking into consideration sea level rise. A dune crest width of 15' is recommended allowing for construction of dunes within the federal foot print and maintaining a distance from the edge of the berm that will prevent erosion to the dunes from wave action. Sand fencing could be placed at the seaward and landward toe of the dune to limit pedestrian traffic. Figures 4 and 5 shows the proposed design template.

The proposed offshore borrow site is an expansion of a presently defined and permitted area utilized for the construction of the 1994 Georgia Port Authority (GPA) South Beach project and the Savannah District 2000 renourishment (See Figure 3). It lies approximately one mile southeast of the southernmost federal terminal groin. The borrow site limits have been extended, principally in a northerly direction, since the volume of sand remaining within the previously permitted area was deemed insufficient to construct the 2019 HIM Supplemental renourishment project in its entirety. Extension of the borrow site in a northward direction was selected to avoid potential impacts to Little Tybee Island CBRA Unit No.1 to the south. Additionally, expansion of the borrow site to the east was not pursued due to the silty nature of the material to the east (i.e. seaward) of the previously authorized borrow site.

In order to support the expansion of the previously defined borrow site, geotechnical, environmental and cultural resources investigations were conducted for the proposed borrow site expansion. An updated hydrographic survey data for the borrow site was performed in August 2018.

Beach fill final placement will be based on physical conditions and funds available at the time of construction. The proposed project is expected to commence by November 2019, and be completed by April 30, 2020.

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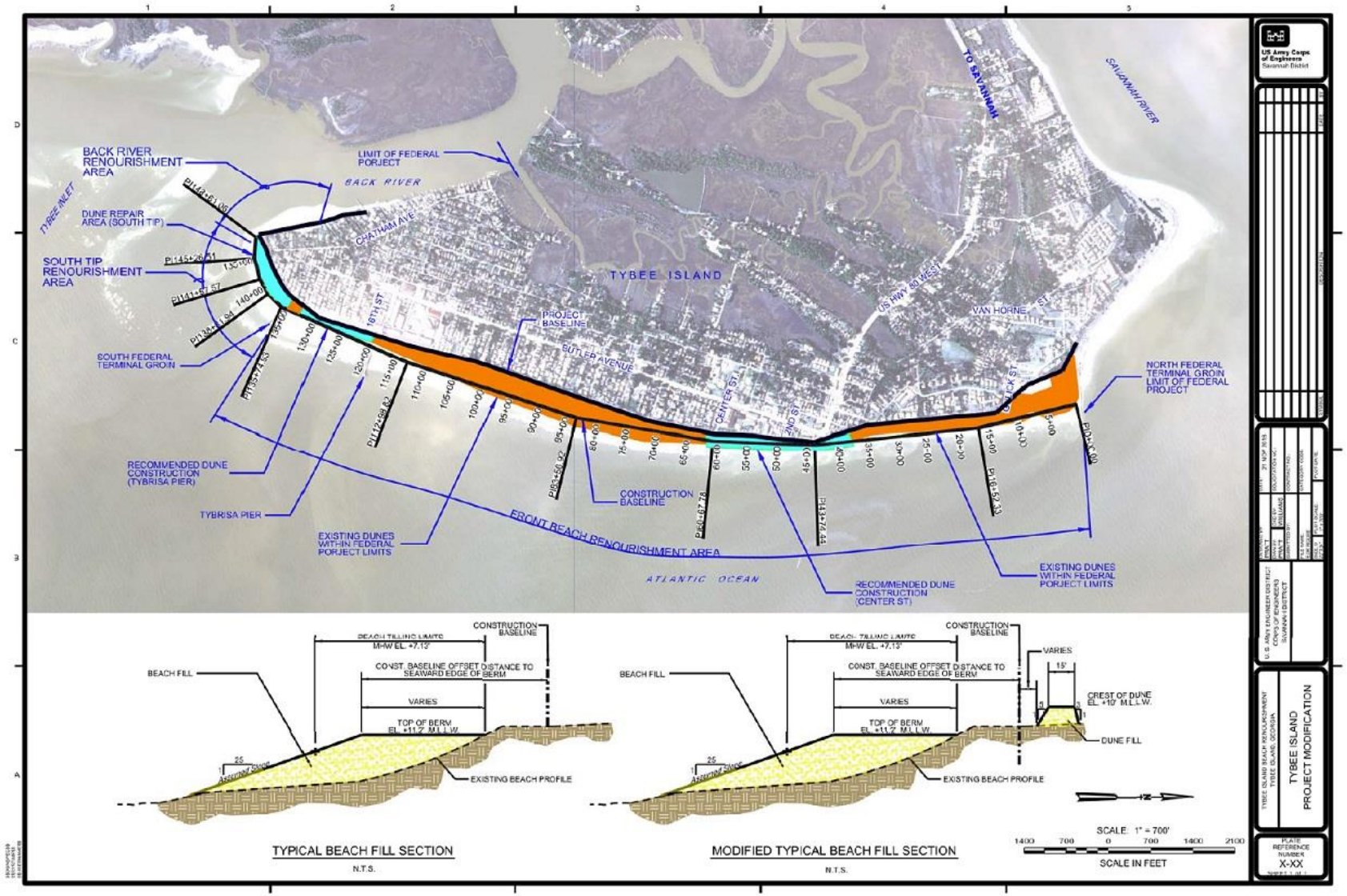



Figure 5: Tybee Island Project description. Existing dunes within the federal project are shown in orange. Recommended dune construction and dune repair areas are shown in blue.

## 3.0 SEDIMENT

### *Existing Beach Sediment*

In November 2018, 14 samples of the native beach sediment were collected from the same locations used during previous borrow area expansions in 1998 and 2007. It is important to note that although the existing beach sediment is referred to as "native", it is actually the result of several previous renourishment projects from different borrow areas. One sample each was collected from the beach berm and from the intertidal beach at seven sampling locations. Samples were collected from the upper 18 inches of sand Samples were transported to the USACE Environmental Material Unit in Marietta, Georgia for laboratory testing. Samples were washed and sieved according to ASTM Method D422. In addition, the Munsell color was determined by ASTM Method 1535, and the visual shell content was estimated.

In general, the native beach sediment consisted of light gray to very pale brown, moderately to poorly graded, fine to medium sized sand with an average shell content of approximately 4.5 percent. Mean grain size ranged from 0.18 to 0.63 mm, with an average value of 0.32 mm (Table 1). Samples with relatively high mean grain size also had relatively high shell content, indicating that the larger fraction of sediment is generally made up of shells. Sorting coefficients ranged from 0.33 to 1.29 phi, with an average value of 0.87 phi (phi: internal friction of soil - according to the Mohr-Coulomb criteria). The percentage of fines (i.e. sediment passing the No. 200 sieve) was less than or equal to 1 percent for all samples.

Sediment characteristics varied significantly along the beach. In general, the mean grain size, sorting coefficient, and percentage shell content were greater on the north-beach than on the south-beach, however these values were greatest at the mid-beach sample location (6$^{th}$ street). The trend of coarser, well graded sand at the north-beach, and finer, poorly graded sand at the south-beach was also observed in the 2007 study and likely reflects greater erosion at the north-beach. Mean grain size and sorting were fairly consistent between the berm and the intertidal beach, however the average shell content was slightly greater for the intertidal beach (5.8 percent) than for the berm (3.3 percent)

Native beach material from the 2018 study was slightly finer (mean grain size of 0.30 mm) than native beach material from the 2007 study (mean grain size of 0.35 mm). The 2018 native beach material was more poorly graded (well sorted) than the 2007 study, with an average sorting coefficient of 0.87 phi compared to 1.31 phi. In addition, the average shell content in 2018 (4.5 percent) was less than in 2007 (12.6 percent; Table 1).

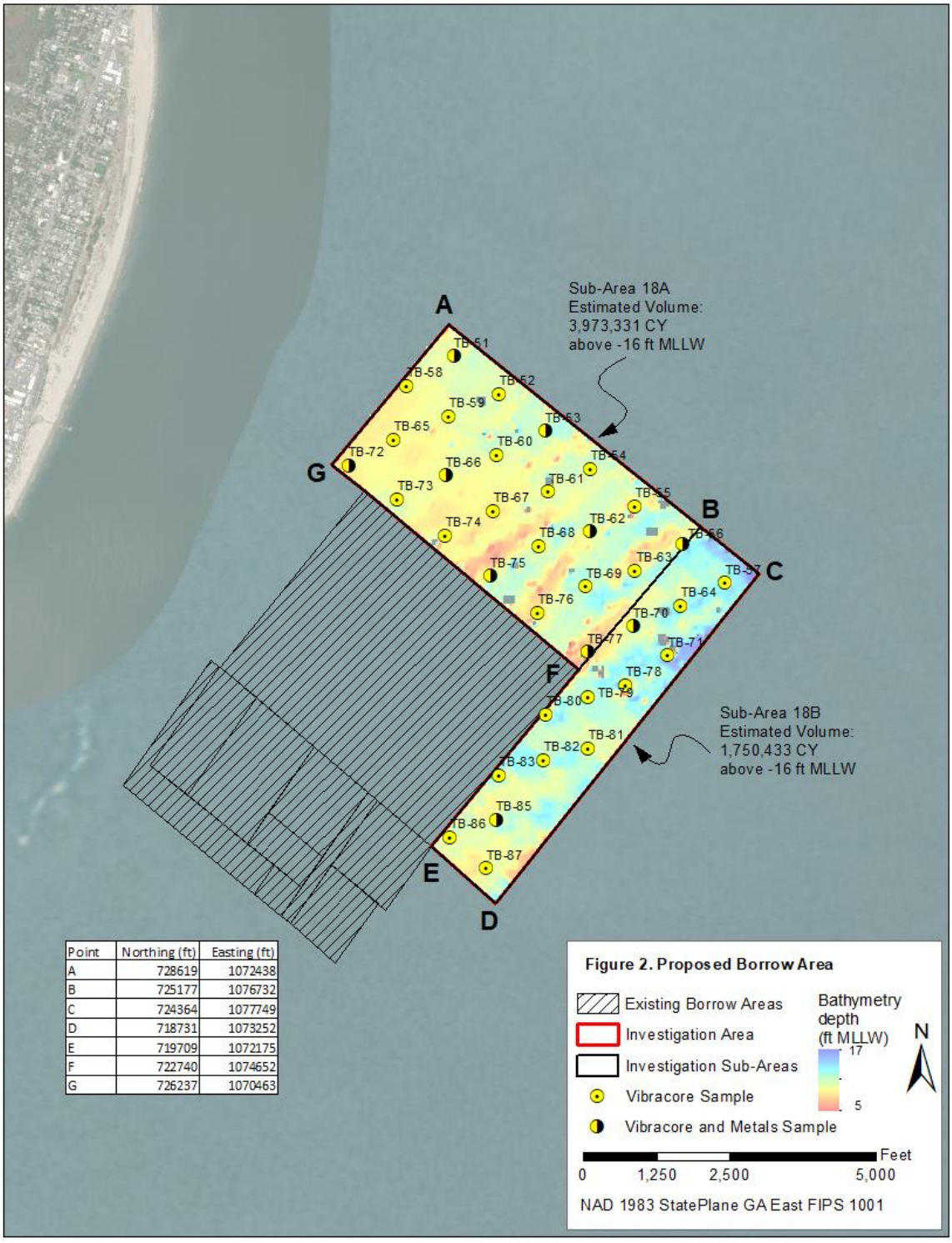
Table 1: Sediment characteristics of the native beach material. Fines content is based on the percentage passing a No. 200 sieve. Consistent with the 2007 geotechnical investigation, the north beach includes sample locations north of 6th St, mid-beach includes sample locations north of 6th street, mid-beach includes samples at 6th street, and south-beach consists of samples south of 6th street.

| Sample Location | Mean (mm) | Mean (phi) | Median (mm) | Median (phi) | Sorting coeff. (phi) | Percent Shell (est.) | Percent Fines | Color |
|---|---|---|---|---|---|---|---|---|
| Gulick Street - Berm | 0.46 | 1.11 | 0.49 | 1.04 | 1.11 | 4.50 | 0.60 | 10YR-7/2 & 7/4 |
| Gulick Street - Intertidal Beach | 0.24 | 2.03 | 0.22 | 2.16 | 0.82 | 5.40 | 1.00 | 10YR-6/1 & 7/4 |
| 2nd Avenue - Berm | 0.31 | 1.69 | 0.24 | 2.06 | 1.20 | 6.90 | 0.70 | 10YR-7/1 |
| 2nd Avenue - Intertidal Beach | 0.44 | 1.19 | 0.34 | 1.54 | 1.45 | 13.20 | 0.40 | 10YR-7/2 & 7/4 |
| 2nd Street - Berm | 0.24 | 2.07 | 0.21 | 2.24 | 0.90 | 6.40 | 0.40 | 10YR-7/1 |
| 2nd Street - Intertidal Beach | 0.18 | 2.47 | 0.18 | 2.45 | 0.36 | 0.00 | 1.00 | 10YR-7/1 |
| 6th Street - Berm | 0.35 | 1.51 | 0.35 | 1.53 | 0.97 | 2.60 | 0.50 | 10YR-7/1 |
| 6th Street - Intertidal Beach | 0.63 | 0.67 | 0.68 | 0.57 | 1.29 | 10.00 | 0.20 | 10YR-7/2 & 7/4 |
| 11th Street - Berm | 0.36 | 1.46 | 0.34 | 1.54 | 1.10 | 2.10 | 0.30 | 10YR-7/2 & 7/4 |
| 11th Street - Intertidal Beach | 0.51 | 0.98 | 0.51 | 0.99 | 1.15 | 11.70 | 0.50 | 10YR-7/2 & 7/4 |
| 17th Street - Berm | 0.21 | 2.22 | 0.20 | 2.31 | 0.60 | 0.40 | 0.30 | 10YR-7/1 |
| 17th Street - Intertidal Beach | 0.19 | 2.37 | 0.19 | 2.37 | 0.44 | 0.00 | 0.70 | 10YR-7/1 |
| Back River - Berm | 0.19 | 2.43 | 0.19 | 2.43 | 0.33 | 0.00 | 0.20 | 10YR-7/1 |
| Back River - Intertidal Beach | 0.19 | 2.37 | 0.19 | 2.37 | 0.39 | 0.30 | 0.10 | 10YR-7/1 |
| **Average of All Samples** | 0.30 | 1.75 | 0.28 | 1.83 | 0.87 | 4.54 | 0.49 | |
| **Berm Average** | 0.29 | 1.78 | 0.27 | 1.88 | 0.89 | 3.27 | 0.43 | |
| **Intertidal Beach Average** | 0.30 | 1.73 | 0.29 | 1.78 | 0.84 | 5.80 | 0.56 | |
| **North Beach Average** | 0.30 | 1.76 | 0.27 | 1.92 | 0.97 | 6.07 | 0.68 | |
| **Mid Beach Average** | 0.47 | 1.09 | 0.48 | 1.05 | 1.13 | 6.30 | 0.35 | |
| **South Beach Average** | 0.25 | 1.97 | 0.25 | 2.00 | 0.67 | 2.42 | 0.35 | |

***Offshore Borrow Site***

Material to be placed on the beach will be obtained from an offshore borrow area located approximately one mile off the coast of Tybee Island (Figure 6). The proposed offshore borrow site is an expansion of a presently defined and permitted area utilized for construction of the 2008, 2014, and 2018 Tybee Island renourishment projects. The borrow area is located adjacent to, and to the northeast of the existing borrow areas. Sediment in the proposed borrow area was characterized using hydrographic survey, vibracore borings, and materials testing. In general, a package of approximately 5.72 million cubic yards (MCY) of beach-compatible sand is readily available above an elevation of -16 feet MLLW. The cut depth of -16 feet MLLW is consistent with adjacent borrow areas and would be the scenario most likely to maximize the volume of beach-compatible material while minimizing the likelihood of disturbing layers of sediment with greater than 10 percent fines content. The compatible sand above -16 feet MLLW ranges in thickness across the study area from approximately 2 to 10 feet thick.

The offshore borrow site was divided into two sub-areas based on proximity to the beach and estimated thickness of beach-compatible material. These sub-areas are shown in Figure 6. Greater volumes were estimated to be available in sub-area 18A (3.97 MCY above -16 feet MLLW) compared to sub-area 18B (1.75 MCY above 16 feet MLLW). A summary of sediment characteristics for the proposed borrow area is provided in Table 2. In general, the sediment consists of light gray to light brownish gray, well graded (poorly sorted), fine sized sand with a shell content of approximately 8 percent. The average percentage of fines (sediment passing the No. 200 sieve) was 3.27 percent, which is well within the state requirement of less than 10 percent. In addition, the shell content was within the state requirement of less than 15 percent of total volume. A portion of the moist samples tested were outside of the desired Munsell color range of 10YR6.5/1 to 10YR7/1, however, once the sand is placed on the beach, the color will lighten as the sediment is dried by the sun. Oven dried samples were roughly two values lighter and ranged from white to very pale brown, consistent with existing beach sediment.




| Point | Northing (ft) | Easting (ft) |
|---|---|---|
| A | 728619 | 1072438 |
| B | 725177 | 1076732 |
| C | 724364 | 1077749 |
| D | 718731 | 1073252 |
| E | 719709 | 1072175 |
| F | 722740 | 1074652 |
| G | 726237 | 1070463 |

Figure 6: Proposed borrow area with bathymetry and location of vibracore samples.

Table 2: Sediment Characteristics for composite profiles measured above -16 feet MLLW and native beach material.

| Area | Median (phi) | Median (mm) | Percent Fines | Percent Shell | Mean (phi) | Sorting Coefficient (phi) | Overfill Factor | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | SPM[a] | Dean (1974)[b] |
| Area 18A | 2.28 | 0.21 | 3.70[c] | 8.23 | 2.05 | 1.19 | 1.40 | 1.20 |
| Area 18B | 2.31 | 0.20 | 2.51[c] | 8.09 | 2.14 | 1.05 | 1.60 | 1.30 |
| Entire Study Area | 2.29 | 0.20 | 3.27[c] | 8.18 | 2.09 | 1.13 | 1.45 | 1.25 |
| 2018 Native Beach Material | 1.83 | 0.28 | 0.49[c] | 4.54 | 1.75 | 0.87 | -- | -- |
| 2008 Borrow Area Material | 2.13 | 0.23 | 0.23[d] | 9.0 | 1.71 | 1.39 | 1.14 | 1.06 |
| 2007 Native Beach Material | 2.02 | 0.25 | 0.05[d] | 12.6 | 1.53 | 1.31 | -- | -- |

[a] Overfill factor was calculated according to the method described in the Short Protection Manual and USACE (2008)
[b] Overfill factor was calculated according to the method described in Dean (1974)
[c] Percent passing the #200 sieve
[d] Percent passing the #230 sieve

### *Sediment Compatibility*

An evaluation of the compatibility of borrow area material above -16 feet MLLW was performed in a manner consistent with previous Tybee Island borrow area investigations (Olsen, 2008). The grain size distribution of the borrow area material was compared with the native beach material and overfill factors were determined. The overfill factor is a parameter that describes how much fill is required, taking into account the differences in grain size distribution between the borrow area and the native beach material. Application of the overfill factor assumes that borrow material placed on the beach will undergo sorting as a result of coastal processes, and over time, will approach the grain size distribution of the native material (USACE, 2008). The overfill factor is determined by comparing mean sediment diameter and sorting values of the native beach and borrow area sediments. The overfill calculation is only an approximate volume estimation, and design volumes will be based on equilibrium beach profile concepts (which take into account borrow and native material grain size) and assessment of historical erosion rates.

Two different methods were used to calculate the overfill factor: the modified Shore Protection Manual (SPM) method and the Dean (1974) method. Each method emphasizes different aspects of the grain size distributions of the borrow area and native beach. The SPM method is generally more conservative (i.e. resulting in a greater overfill factor) than the Dean (1974) method. Calculated overfill factors ranged from 1.2 to 1.4 for sub-area 18A and from 1.3 to 1.6 for sub-area 18B (Table 2). For comparison, the overfill factors from the 2008 borrow area expansion ranged from 1.06 to 1.14. The higher overfill factors for the proposed borrow area reflect that the sediment is somewhat finer (mean grain size of 0.23 mm) than both the native beach sediment (mean grain size of 0.30 mm) and sediment from the 2008 borrow area (mean grain

size of 0.31 mm). Because of this, it is recommended that an appropriate volume of overfill be added in order to account for variations in the grain size distribution of the borrow area sediment and the native beach sediment. This will likely result in dredged volumes greater than what have been needed for previous Tybee Island beach renourishment projects. A comparison of the grain size distribution of the native beach material and proposed borrow areas is shown in Figure 7.

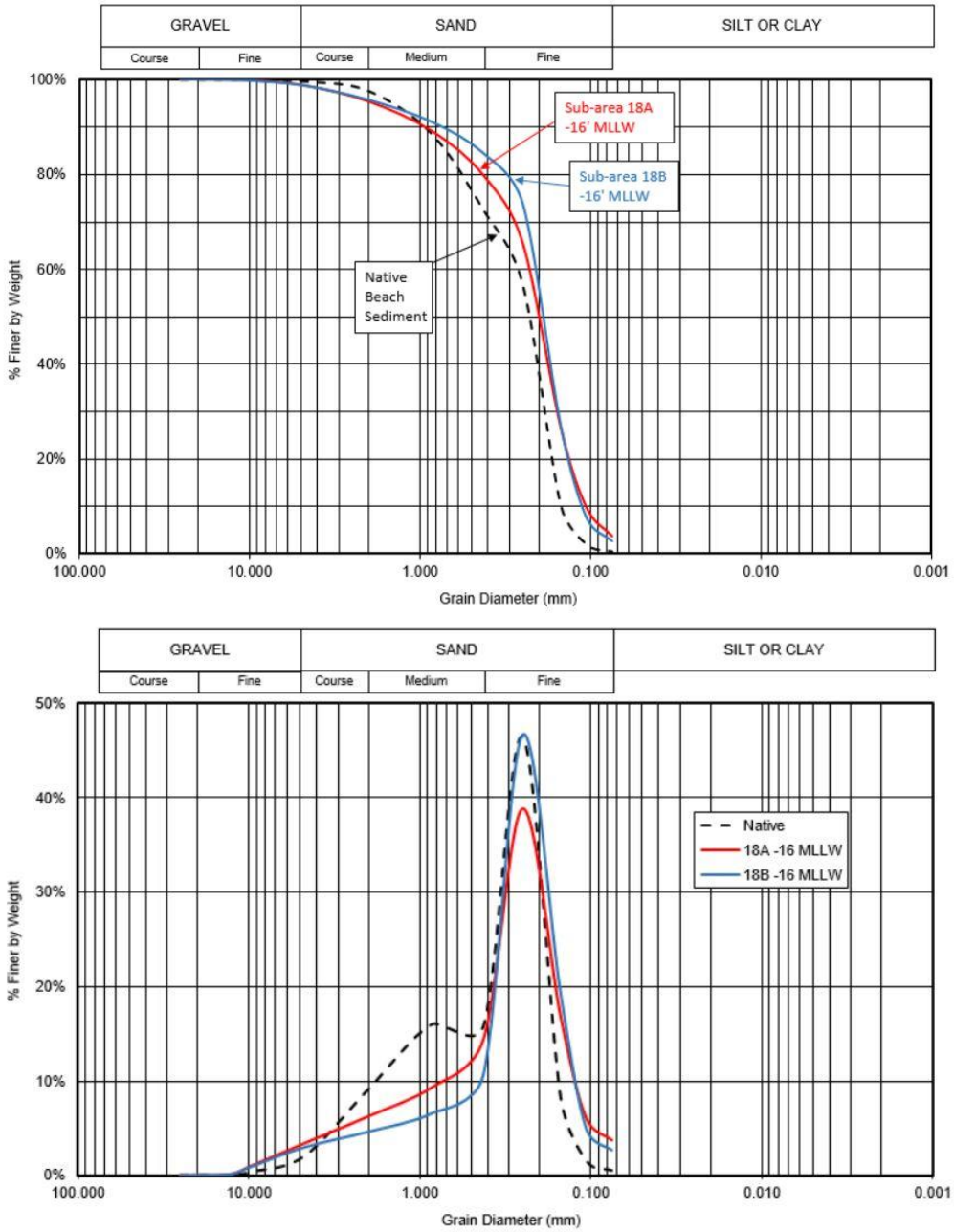



Figure 7: Grain size distribution of native beach material (black dashed line), sub-area 18A fill material (red line), and sub-area 18B (blue line).

As stated previously, the grain size distribution varies considerably between the north-beach and the south-beach. This bi-modal distribution makes it difficult to compare the average values of the borrow material to those of the native beach material. The borrow area sediment has a mean grain size (0.23 mm) that is closer to the mean grain size of the south-beach (0.25 mm) than the north-beach (0.30 mm), and a sorting coefficient (1.13 phi) that is closer to the sorting coefficient of the north beach (0.97 phi) than the south-beach (0.67 phi). Despite this uncertainty, it is important to note that previous renourishment projects have used similarly compatible material from nearby borrow areas with satisfactory results. It is expected that material from the proposed borrow area will perform similarly well to past renourishment projects.

### *Contaminant Testing*

Sediment from the proposed borrow area was tested for heavy metals, consistent with previous borrow area investigations. In November 2018, ten sediment samples were collected according to USEPA Region 4 guidance (USEPA, 2014) from selected vibracore borings at a depth above -16 feet MLLW (see Figure 4). Sediment samples were transferred to laboratory provided containers and immediately stored on ice prior to shipment to the analytical laboratory. All samples were analyzed for heavy metals using USEPA Method 6010D by a National Laboratory Accreditation Program (NELAP) certified laboratory (Test America in Savannah, GA).

Previous sediment testing at adjacent borrow area sites have revealed no issues of concern. Similarly, no contaminants were found during the current investigation that exceed sediment ecological screening values set forth in the USEPA Region 4 Ecological Risk Assessment Supplemental Guidance (USEPA, 2015). A summary of metals results is shown in Table 3.

Table 3: Summary of metals results.

| Sample | Units | Arsenic | Cadmium | Chromium | Lead | Mercury | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|
| TB-51 | mg/kg | 1.2 J | 0.11 U | 4.7 | 1.8 | 0.0094 U | 1.0 U | 0.064 U |
| TB-53 | mg/kg | 1.4 J | 0.10 U | 3.4 | 0.97 J | 0.0097 U | 1.0 U | 0.063 U |
| TB-56 | mg/kg | 2.6 | 0.11 U | 2.3 | 0.99 J | 0.0094 U | 1.2 J | 0.064 U |
| TB-62 | mg/kg | 1.6 J | 0.10 U | 3.3 | 1.4 | 0.0082 U | 1.0 U | 0.062 U |
| TB-66 | mg/kg | 1.9 J | 0.10 U | 3.9 | 1.5 | 0.0084 U | 1.0 U | 0.062 U |
| TB-70 | mg/kg | 1.2 J | 0.10 U | 4.8 | 1.8 | 0.0080 U | 1.0 U | 0.063 U |
| TB-72 | mg/kg | 4.4 | 0.10 U | 2.9 | 1.3 | 0.0091 U | 0.99 U | 0.061 U |
| TB-75 | mg/kg | 0.88 U | 0.11 U | 3.5 | 1.2 | 0.010 U | 1.1 U | 0.066 U |
| TB-77 | mg/kg | 3.1 | 0.11 U | 2.6 | 1.2 | 0.0098 U | 1.1 U | 0.068 U |
| TB-85 | mg/kg | 2.1 | 0.10 U | 3.4 | 0.98 J | 0.0094 U | 0.99 U | 0.061 U |
| Maximum Value | mg/kg | 4.4 | 0.11 U | 4.8 | 1.8 | 0.010 U | 1.2 J | 0.068 U |
| Screening Level [a] | mg/kg | 7.24 | 0.68 | 52.3 | 30.2 | 0.13 | NL | 0.73 |

[a] Screening level for metals based on the Georgia Ecological Screening Value for Marine/Estuarine Sediment (USEPA, 2015).
NL – Not listed
U – The analyte was not detected at the method limit of detection
J – The analyte was positively identified; the quantitation is an estimation

## 4.0 IMPACTS TO PROTECTED SPECIES AND ESSENTIAL FISH HABITAT

The proposed action would occur within the coastal zone, so consistency with Georgia's CZM Program is required. The proposed action would result in only minor temporary direct and indirect impacts to Tybee beach and the surrounding coastal zone. Species of concern that may be impacted by the proposed action are listed in Table 4. Table 5 shows Essential Fish Habitat (EFH) as identified in Fishery Management Plan Amendments for the South Atlantic and Mid-Atlantic Fishery Management Councils, geographically defined areas of particular concern and whether or not these areas/habitats occur within the project vicinity or if areas will be impacted by project activities.

Table 4: Species of concern that may be impacted by the proposed action.

| **Species** | **Federal** | **State** | **Habitat** |
|---|---|---|---|
| Florida Manatee (*Trichechus manatus latirostris*) | Threatened | Endangered | Estuaries; tidal rivers, nearshore ocean waters |
| North Atlantic Right Whale (*Eubalaena glacialis*) | Endangered | Endangered | Inshore and offshore ocean waters |
| Sei Whale (*Balenoptera borealis*) | Endangered | Not Listed | Inshore and offshore ocean waters |
| Blue Whale (*Balaena musculus*) | Endangered | Not Listed | Inshore and offshore ocean waters |
| Sperm Whale (*Physeter catodon*) | Endangered | Not Listed | Inshore and offshore ocean waters |
| Finback Whale (*Balaenoptera physalus*) | Endangered | Not LIsted | Inshore and offshore ocean waters |
| Humpback Whale (*Megaptera novaeangliae*) | Endangered | Not Listed | Inshore and offshore ocean waters |
| Piping Plover (*Charadrius melodus*) | Threatened | Threatened | Sandy beaches; tidal flats, inlets |
| Wilson's Plover (*Charadrius wilsonia*) | Not Listed | Threatened | Sandy beaches; tidal flats |
| Red Knot (*Calidris canutus rufa*) | Threatened | Threatened | Beaches and exposed mudflats |
| Gull-billed Tern (*Gelochelidon nilotica*) | Not Listed | Threatened | Salt marshes; fields; sandy beaches, interdune, dredge islands |
| Loggerhead Sea Turtle (*Caretta caretta*) | Threatened | Endangered | Open ocean; sounds; coastal rivers; beaches |
| Leatherback Sea Turtle (*Dermochelys coriacea*) | Endangered | Endangered | Open ocean; sounds; coastal beaches |
| Green Sea Turtle (*Chelonia mydas*) | Threatened | Threatened | Open ocean; sounds; coastal rivers; beaches |
| Kemp's Ridley Sea Turtle (*Lepidochelys kempii*) | Endangered | Endangered | Open ocean; sounds; coastal rivers; beaches |
| Atlantic Sturgeon (*Acipenser oxyrhyncus*) | Endangered | Endangered | Estuaries; lower end of large rivers in deep pools with soft substrates; spawn as far inland as Macon, GA on the Ocmulgee |

| Table 5: Essential Fish Habitat. | | | | |
|---|---|---|---|---|
| **Essential Fish Habitat** | **Potential Presence** | | **Potential Impacts** | |
| | **In/Near Project Vicinity** | **Project Impact Area** | **Dredge Plant Operation** | **Beach Disposal Activities** |
| **Estuarine Areas** | | | | |
| Estuarine Emergent Wetlands | Yes | No | No | No |
| Estuarine Scrub/ Shrub Mangroves | No | No | No | No |
| Submerged Aquatic Vegetation (SAV) | No | No | No | No |
| Oyster Reefs & Shell Banks | Yes | No | No | No |
| Intertidal Flats | Yes | Yes | No | No |
| Palustrine Emergent & Forested Wetlands | No | No | No | No |
| Aquatic Beds | No | No | No | No |
| Estuarine Water Column | Yes | Yes | Yes | Yes |
| **Marine Areas** | | | | |
| Live/Hard Bottoms | No | No | No | No |
| Coral & Coral Reefs | No | No | No | No |
| Artificial/ Manmade Reefs | No | No | No | No |
| *Sargassum* | No | No | No | No |
| Water Column | Yes | Yes | Yes | Yes |
| **Geographically Defined Habitat Areas of Particular Concern** | | | | |
| **Area-Wide** | | | | |
| Council designated Artificial Reef Special Management Areas | No | No | No | No |
| Hermatypic (reef-forming) Coral Habitats & Reefs | No | No | No | No |
| Hoyt Hills | No | No | No | No |
| *Sargassum* Habitat | No | No | No | No |
| State Designated Areas of Importance of Managed Species (PNAs) | No | No | No | No |
| Submerged Aquatic Vegetation (SAV) | No | No | No | No |
| **Georgia** | | | | |
| Gray's Reef | No | No | No | No |

While all of the species listed in Table 4 have been known to be seen within the project area, the species most likely to be adversely impacted includes the Florida manatee, North Atlantic Right Whales, sea turtles, piping plovers, and the newly listed red knot.

Dredging activities are not expected to affect the other species of listed whales for two reasons: (1) No other species of whales are expected to occur with regularity in the project area where the proposed dredging and beach nourishment would occur, (2) Other whales are not known to exhibit behaviors that would make them susceptible to ship collisions, as is known to be the case for the right whale.

It is not expected that Atlantic sturgeon would commonly use open nearshore ocean habitats where the project's activities would be performed. No impacts to sturgeon eggs

or larvae are expected. The proposed work will not impact Atlantic sturgeon critical habitat in the Savannah River. Due to these reasons, the proposed project may affect but is not likely to adversely affect Atlantic sturgeon or their preferred habitats.

Intertidal areas and mudflats are important dwelling habitat and feeding areas for benthic macroinvertebrates, juvenile fish species, arthropods, mollusks, and predatory organisms that feed on these species. The proposed project will place fill in areas of Tybee's intertidal flats burying some organisms while others more motile will likely avoid and survive the dispersal event. Impacts to intertidal areas are expected to be temporary and minor in nature. Although intertidal areas will experience some negative effects the habitat will increase in size due to the fill placement resulting in an overall benefit.

Total suspended particulate matter produced by this activity is expected to be similar to that produced by other authorized forms of dredging. These effects are expected to be temporary and minor. Temporary toe dikes will constructed parallel with the shore to control the hydraulic effluent and reduce turbidity. In addition, the quality of dredged material used during this renourishment is primarily fine grained poorly graded SP sands. This material is appropriate for beach placement and should produce very little turbidity.

Although no work is occurring directly in the estuarine water column, it is possible turbidity effects resulting from work within the marine water column may impact estuarine waters upstream in the Savannah River due to incoming tides. These impacts would be considered temporary and minor in nature.

## 5.0 ACTIONS TO REDUCE IMPACTS

Detailed below, the USACE, Savannah District will take the following steps to reduce impacts to species and communities within Georgia's coastal zone.

- The Contractor shall maintain a special watch for piping plover, red knots, sea turtles, whales and Florida manatee for the duration of this contract and report any sightings to the Contracting Officer. Endangered Species Watch Plan. A watch plan that is adequate to protect endangered species from the impacts of the dredging and associated operations must be approved by the Contracting Officer before any dredging activities take place. The watch plan shall be for the entire period of dredging and transportation of material from the borrow area to the beach project area.

- All in-water operations, including vessels, must be shut down if a manatee(s) comes within 50 feet of the operation. Activities will not resume until the manatee(s) has moved beyond the 50-foot radius of the project operation, or until 30 minutes elapses if the manatee(s) has not reappeared within 50 feet of the operation. Animals must not be herded away or harassed into leaving.

- The contractor will instruct all personnel associated with the dredging and renourishing of the beach of the potential presence of piping plover, red knots, manatees, dolphins, sturgeon, whales, and sea turtles, and the need to avoid collisions with these species and educate the personal on the civil and criminal penalties for harming, harassing, or killing manatees, sea turtles, and whales which are protected under the Marine Mammal Protection Act of 1972, and or the Endangered Species Act of 1973.

- Siltation or turbidity barriers placed around project sites (borrow and placement) will be made of material in which manatees cannot become entangled, be properly secured, and be regularly monitored to avoid manatee entanglement or entrapment. Barriers must not impede manatee movement.

- All vessels associated with the project will operate at "no wake/idle" speeds at all times while in the immediate area and while in the water where the draft of the vessel provides less than four feet clearance from the bottom. All vessels will follow routes of deep water whenever possible.

- Extreme care will be taken in lowering equipment or materials, including, but not limited to pipelines, dredging equipment, anchors, etc., below the water surface to the ocean floor; taking any precautions not to harm any manatees that may have entered the project area undetected. All such equipment will be lowered at the lowest possible speed.

- To prevent a crushing hazard to manatees, if plastic pipeline is used to transport material from the borrow site to the beach the pipeline will be secured to the ocean floor or to a fixed object along its length to prevent movement with the tides or wave action.

- The proposed construction window is between November 2015 and 30 April 2016 in order to avoid impacts to nesting and hatching sea turtles, larval fish, macroinvertebrate, and shrimp species.

- Shorebird monitoring will be conducted prior to and during construction activities in the vicinity of critical habitat unit GA-1. A 200 foot buffer zone will be established around feeding piping plovers and red knots. If necessary, construction activities would be modified to minimize any disturbance to wintering or migratory shorebirds on site. Any construction related activities that could potentially harass feeding piping plovers or red knots shall cease while piping plovers or red knots are in the buffer zone. If birds settle into designated construction areas such as truck routes, the creation of alternate truck routes would avoid disturbance to the birds. Relocation of the travel corridor shall also be considered if birds appear agitated or disturbed by construction related activities.

- All temporary project materials will be removed upon completion of the work. No construction debris or trash will be discarded into the water.

## 6.0 CONCLUSIONS

The proposed emergency supplemental funds renourishment is within the same footprint as to what has previously been performed at Tybee Island during the first periodic renourishment in 1987 by the Savannah District, the subsequent 1995 work by Georgia Ports Authority (GPA), and the renourishments in 2000, 2008, 2015, and 2018 also conducted by the Savannah District. Also, similar techniques and equipment will be used. All previous renourishments at Tybee Island received required environmental approvals.

The proposed actions are meant to alleviate erosion impacts to the Tybee Island beach that occurred during Hurricane Irma as well as add resiliency to the Tybee Island Shoreline Protection Project. The borrow sites materials are within Georgia's guidelines for beach nourishment projects. Beyond the window of November 2019 – April 2020, several other efforts will be made to reduce negative impacts to listed species and essential fish habitat. The extension of the borrow area north also reduces impacts to Little Tybee Island. With the above requirements, USACE Savannah District believes this project is fully consistent with the enforceable policies of the State of Georgia's Coastal Zone Management Program.

## 7.0 REFERENCES

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# APPENDIX D

# ESSENTIAL FISH HABITAT

# TYBEE ISLAND, GEORGIA
# SHORELINE PROTECTION PROJECT
# 2019 HURRICAN HARVEY, IRMA, MARIA
# EMERGENCY SUPPLEMENTAL
# RENOURISHMENT

# U.S. ARMY CORPS OF ENGINEERS
# SAVANNAH DISTRICT

# APRIL 2019

## 1.0 INTRODUCTION

The purpose of this assessment is to fulfill obligations written in the 2005 Limited Reevaluation Report (LRR) for Tybee Island, Georgia which states that “Conduct of an environmental assessment during the Plans and Specifications stage will provide an opportunity to assess the project’s impact on Essential Fish Habitat” and complies with the Savannah District’s commitment in the FONSI for the 934 Project to “address environmental concerns present at the time of successive renourishments.”

This evaluation is conducted in accordance with Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (As Amended Through October 11, 1996). That provision states: "Each Federal agency shall consult with the Secretary with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken, by such agency that may adversely affect any essential fish habitat identified under this Act." It is also done in accordance with the Interim Final Rule (par. 600.920(g)) that requires an EFH Assessment contain the following: (1) Description of the Proposed Action, (2) An Analysis of the Effects, including cumulative effects, of the action on EFH, the managed species, and associated species by life history stage, (3) The Federal agency's views regarding the effects of the action on EFH, and (4) Proposed mitigation, if applicable.

Tybee Island is located 17 miles east of Savannah at the mouth of the Savannah River on the Atlantic Ocean (Figure 1). Tybee Island is Georgia’s most densely developed barrier island, bordered on the north by the South Channel of the Savannah River, on the east by the Atlantic Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system.

The authorized project consists of nourishment of 13,200 linear feet of beach between two terminal groins (referred to as Oceanfront Beach); construction of a groin field along 1,100 linear feet of shoreline from the southern terminal groin around the South Tip to the mouth of Tybee Creek (also known as Back River) including periodic nourishment (referred to as South Tip Beach); and construction of a groin field and nourishment of 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach). The beach was last renourished in 2015 and repaired in 2018. In 2019, there will be 5 years left in the project life (i.e. Federal participation). The 2015 renourishment was intended to provide material to maintain the beach and guard from potential erosion through 2024. After hurricanes Matthew in 2016 and Irma in 2017, supplemental nourishment was conducted in 2018 to add material that was lost due to storm damage. The Borrow Area Extension of 2008 (BAE 08) was used for the 2008 and 2015 renourishments and the 2018 hurricane repairs. BAE 08 has been exhausted, requiring an expansion of the borrow area.


Figure 1: Tybee Island Shore Protection Map.

Previous investigations have found that dunes within the federal footprint would protect the Federal investment, improve the storm protection benefits, decrease maintenance costs, and delay the need for subsequent renourishment projects (USACE 1988, USACE 1994). Historic erosion rates across the beach profile have shown high erosion in areas known as "hot spots" (Figure 2). The following is a quote from the Section 905(b) Study, dated Sept. 2004, "Since 1975, over 6.9 million cubic yards (CY) of sand have been placed along Tybee's shoreline. The net erosion rate estimated for the beach erosion control project is approximately 78,000 CY/yr. However, hot spots alone that occur primarily at Second Street lose over 125,000 CY/yr". These hot spots create areas that are vulnerable to storm surge - causing damage to infrastructure, existing dunes and breaches in the design template.

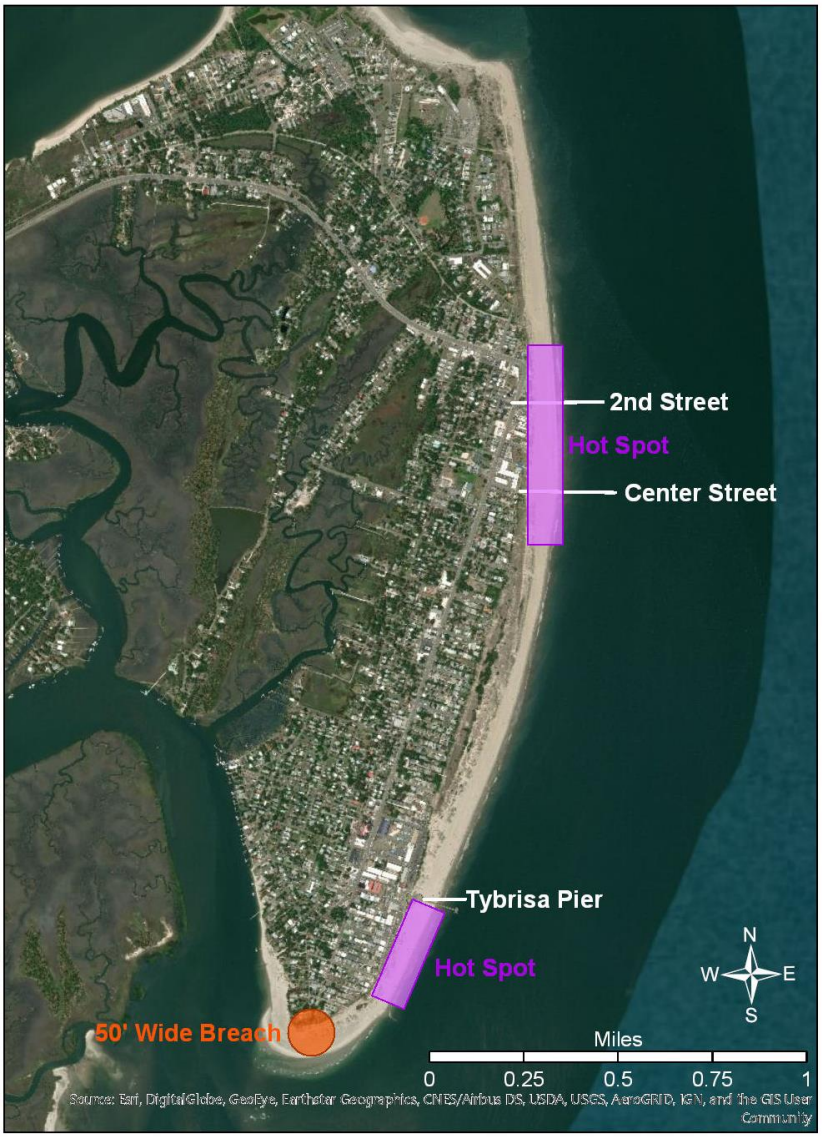


Figure 2: Tybee Island Erosion Hotspots

## 2.0 COORDINATION

Savannah District has initiated informal consultation of the proposed project with the National Oceanic and Atmospheric Administration (NOAA) Fisheries Habitat Conservation Division and is now requesting concurrence with the effects analysis.

## 3.0 DESCRIPTION OF PROPOSED ACTION

Project elevations for design and construction are established from NOAA tide gage Station 8670870 at Fort Pulaski, GA and based on mean lower low water (MLLW) in accordance with ER 110-2-8160 and EM 110-2-6056. Conversion from MLLW to NAVD88 at Station 9670870: +0' MLLW = +4.05' NAVD88

As proposed, the project will be constructed using a hydraulic cutterhead pipeline dredge and support equipment. A submerged pipeline will extend from the borrow site to the southerly tip of Tybee Island. Shore pipe will be progressively added to perform fill placement along the shorefront or creekfront areas to be renourished. Temporary toe dikes will be utilized in a shore parallel direction to control the hydraulic effluent and reduce turbidity. The sand will be placed in the form of varying design templates based upon longshore volumetric fill requirements which reflect beach conditions at the time of construction. Additional beach fill will be strategically placed in areas of documented highest erosional stress such as the 2nd Street "hot spot". Existing dunes are minimal in the hot spot areas.

The proposed sand source for this renourishment is the borrow area extension. The original borrow area is located approximately 4,000 feet southeast of the southernmost Federal terminal groin. Figure 3**Error! Reference source not found.** shows the location of the borrow area with the borrow area extension. The borrow site limits have been extended, principally in a northerly direction, since the volume of sand remaining within the previously permitted area was deemed insufficient to construct the 2019 HIM Supplemental renourishment project in its entirety. Extension of the borrow site in a northward direction was selected to avoid potential impacts to Little Tybee Island CBRA Unit No.1 to the south. Additionally, expansion of the borrow site to the east was not pursued due to the silty nature of the material to the east (i.e. seaward) of the previously authorized borrow site.

The Northwest facing side of the 2019 borrow location extension is ~3,090 ft (long edge toward Tybee). The Northeast facing side of the 2019 borrow location extension is ~6,800 ft (long edge facing the Savannah River navigation channel). The East facing side of the 2019 borrow location extension is ~7,160 ft (long edge facing the ocean.) The total area of the 2019 proposed borrow area extension is ~625 acres. Total area of the 2015 borrow area was ~213 acres. Total area of the 2008 borrow locations was ~256 acres. Total of yellow "original borrow area limits" was ~290 acres. The total area of the whole borrow area, including the extension, is ~1,340 acres.

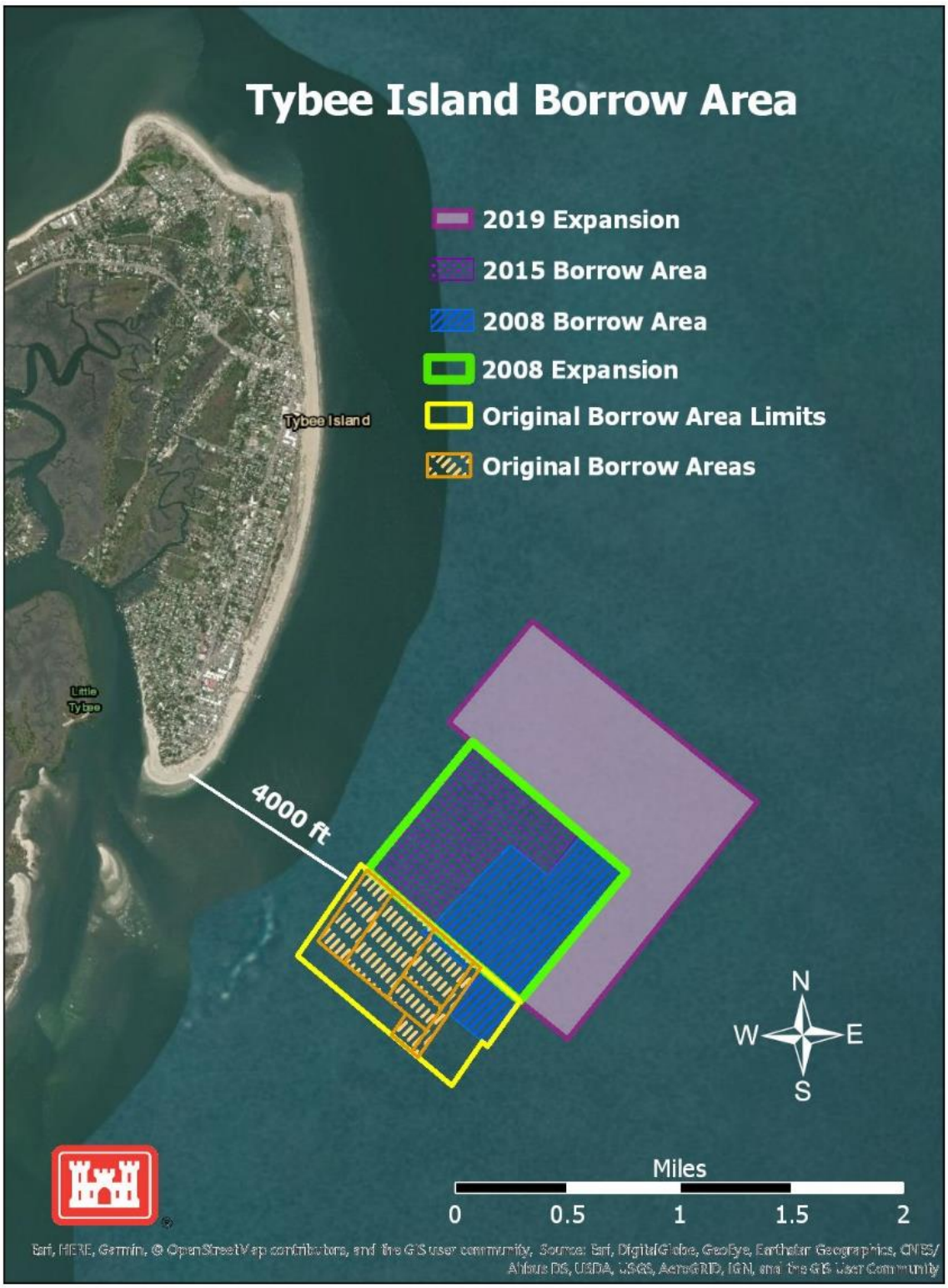


Figure 3: Tybee Island borrow area history and planned expansion.

The proposed project template design is based on project performance and erosion rates since the last renourishment project in 2018, the calculated storm damage, and the proposed dune construction sites. Areas include the North Beach (North End Groin to Oceanview Court), Second Street area (Oceanview Court to Center Street), Middle Beach (Center Street to 11th Street), South Beach (11th Street to South End Groin), and the South Tip Groin Field. Additional fill will be placed between these areas to provide a more stable beach profile and to avoid some of the excessive losses in the 2nd Street "hot spot" from project end losses and offshore losses that resulted from the wide beach constructed at this location during the last renourishment. Beach widths on the Oceanfront Beach will vary from a 25-foot width berm, to a berm approximately 350 feet wide at the elevation of +11.2 MLLW. Based on natural angle of repose on the existing beach, and experience with previous placement, a beach slope of 1 vertical on 25 horizontal will be required on the oceanfront beach (Figure 4).

Incorporation of existing dunes within the federal project would include approximately 9,500 linear feet of existing dunes meeting the requirements of the modified template along the Front Beach renourishment area. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. Existing dunes in the federal project are shown in Figure 5 in orange.

Recommended dune construction within the federal project includes 3,700 linear feet of the Front Beach renourishment area addressing hot spots (Figure 5; blue shaded area). In addition, approximately 1,100 linear feet along the South Tip renourishment area would be considered for dune construction in order to rebuild dunes to meet the requirements of the recommended template. The angle of repose of existing dunes with matching characterization of available sand was measured throughout the project. The recommend dune portion of the template will use a 1:5 slope on the seaward side of the dune and a 1:3 slope on the landward side of the dune based off of the field data collected. Dune crest height of +19' MLLW is recommended to protect against storm surge with a one percent exceedance probability while taking into consideration sea level rise. A dune crest width of at least 15' is recommended allowing for construction of dunes within the federal foot print and maintaining a distance from the edge of the berm that will prevent erosion to the dunes from wave action. Sand fencing could be placed at the seaward and landward toes of the dune to limit pedestrian traffic. Figures 4 and 5 show the proposed design template.

In order to support the expansion of the previously defined borrow site, geotechnical, environmental and cultural resources investigations were conducted for the proposed borrow site expansion. An updated hydrographic survey data for the borrow site was performed in August 2018.

Beach fill final placement will be based on physical conditions and funds available at the time of construction. The proposed project is expected to commence by November 2019, and be completed by April 30, 2020.

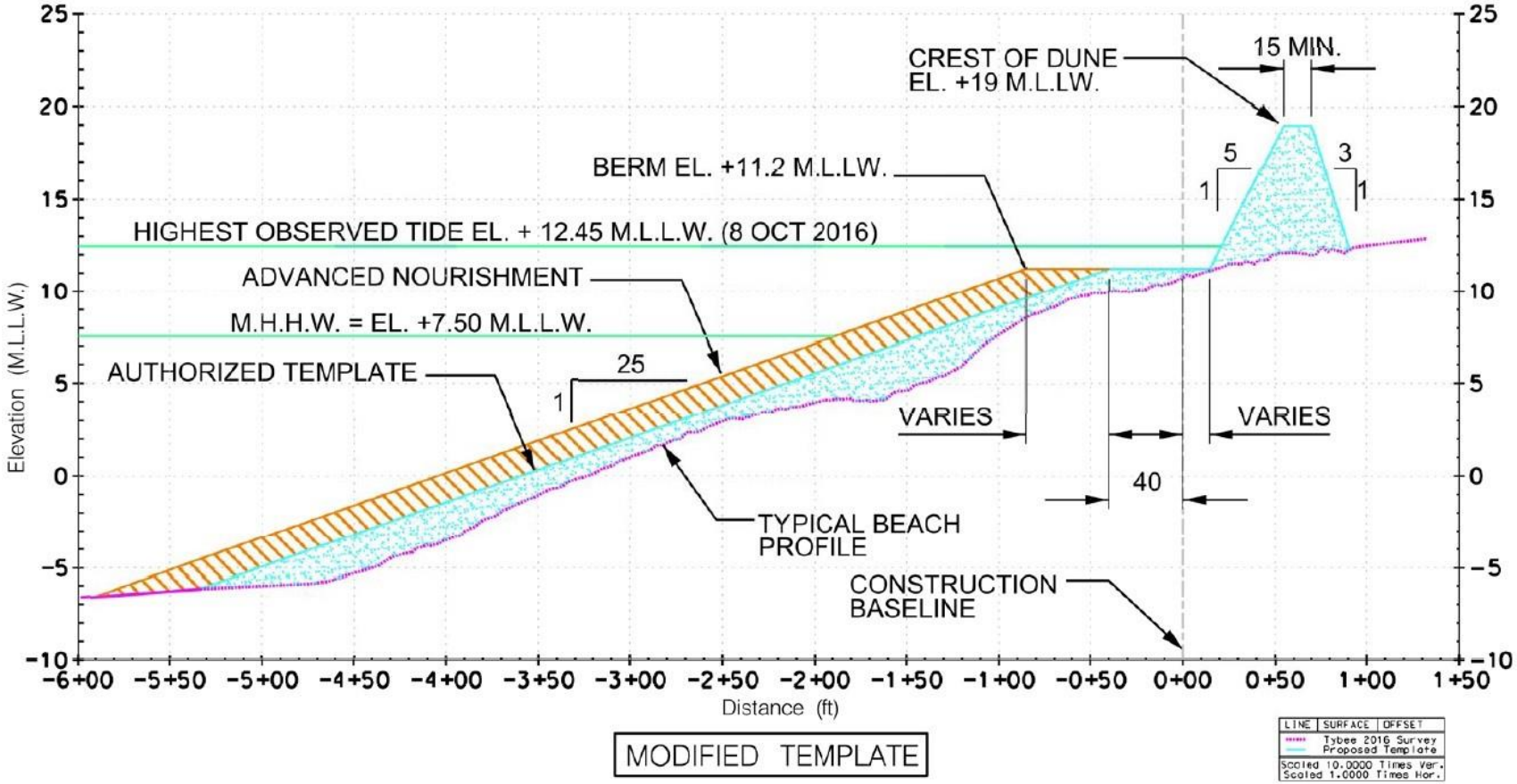


Figure 4: Tybee Island Modified Template.

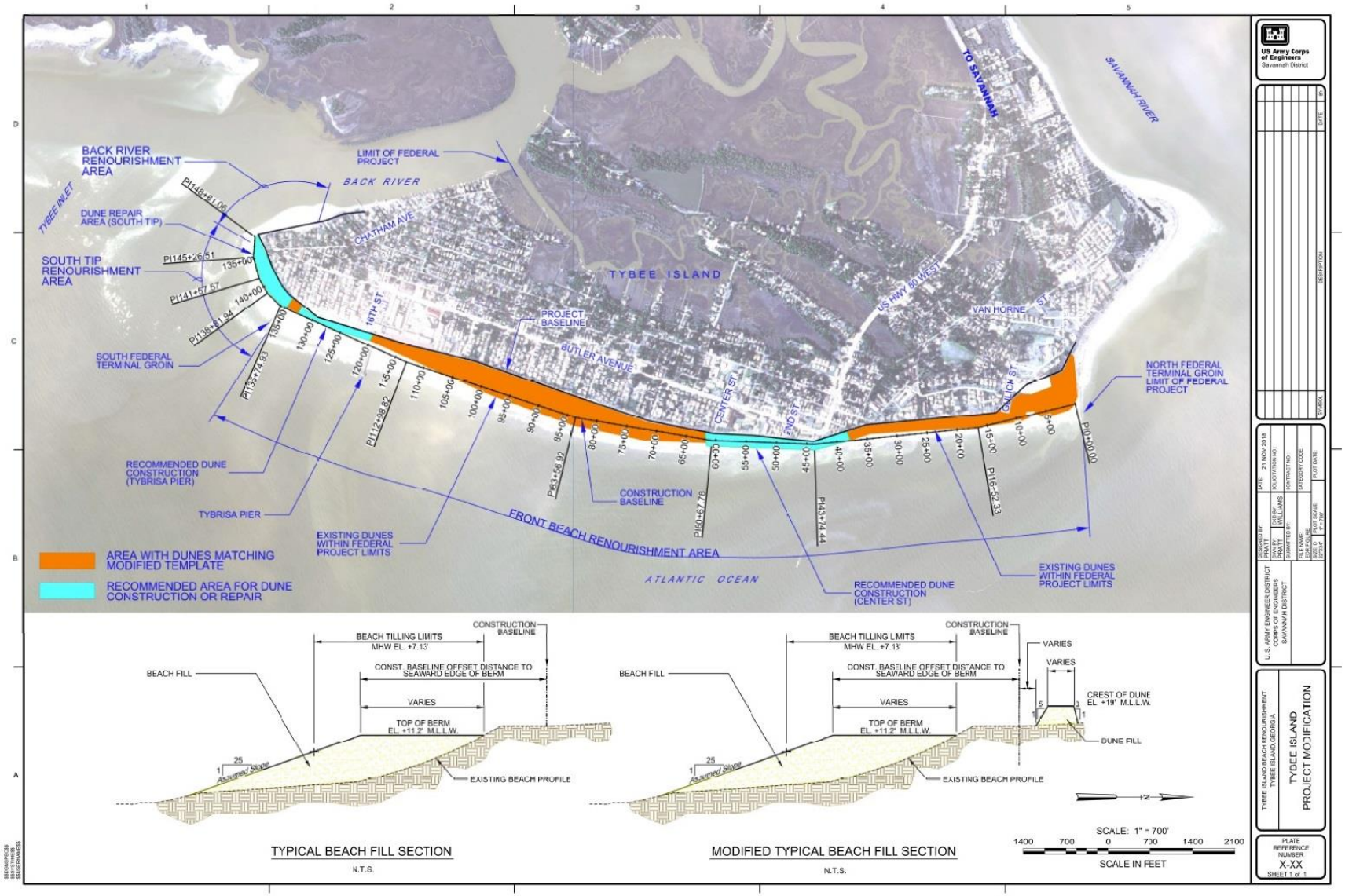


Figure 5: Tybee Island Project description. Existing dunes within the federal project are shown in orange. Recommended dune construction areas are shown in blue.

## 4.0 ANALYSIS OF THE EFFECTS OF THE PROPOSED WORK ON EFH

### 4.1 IDENTIFY APPLICABLE EFH

EFH habitat applicable to this proposal includes intertidal flats and marine and estuarine water column.

#### 4.1.1 Generalized Areas Designated by the South Atlantic Fisheries Management Council

Table 1 shows EFH as identified in Fishery Management Plan Amendments for the South Atlantic and Mid-Atlantic Fishery Management Councils, geographically defined areas of particular concern and whether or not these areas/habitats occur within the project vicinity or if areas will be impacted by project activities. Areas listed in this table were derived from Essential Fish Habitat: A Marine Fish Habitat Conservation Mandate for Federal Agencies. February 1999 (Revised 10/2001; Appendices 4 and 5).

Table 1: Essential Fish Habitat Areas.

| Essential Fish Habitat | Potential Presence | | Potential Impacts | |
|---|---|---|---|---|
| | In/Near Project Vicinity | Project Impact Area | Dredge Plant Operation | Beach Disposal Activities |
| **Estuarine Areas** | | | | |
| Estuarine Emergent Wetlands | Yes | No | No | No |
| Estuarine Scrub/ Shrub Mangroves | No | No | No | No |
| Submerged Aquatic Vegetation | No | No | No | No |
| Oyster Reefs & Shell Banks | Yes | No | No | No |
| Intertidal Flats | Yes | Yes | No | No |
| Palustrine Emergent & Forested Wetlands | No | No | No | No |
| Aquatic Beds | No | No | No | No |
| Estuarine Water Column | Yes | Yes | Yes | Yes |
| **Marine Areas** | | | | |
| Live/Hard Bottoms | No | No | No | No |
| Coral & Coral Reefs | No | No | No | No |
| Artificial/ Manmade Reefs | No | No | No | No |
| *Sargassum* | No | No | No | No |
| Water Column | Yes | Yes | Yes | Yes |
| **Geographically Defined Habitat Areas of Particular Concern** | | | | |
| **Area-Wide** | | | | |
| Council designated Artificial Reef Special Management Areas | No | No | No | No |
| Hermatypic Coral Habitats & Reefs | No | No | No | No |
| Hoyt Hills | No | No | No | No |
| *Sargassum* Habitat | No | No | No | No |
| State Designated Areas of Importance of Managed Species | No | No | No | No |
| Submerged Aquatic Vegetation | No | No | No | No |
| **Georgia** | | | | |
| Gray's Reef | No | No | No | No |

#### 4.1.1.2 Intertidal Flats

Intertidal areas and mudflats are important dwelling habitat and feeding areas for benthic macroinvertebrates, juvenile fish species, arthropods, mollusks, and predatory organisms that feed on these species. The proposed project will place fill in areas of Tybee's intertidal flats burying some organisms while others more motile will likely avoid and survive the dispersal event. Impacts to intertidal areas are expected to be temporary and minor in nature. Although intertidal areas will experience some negative effects the habitat will increase in size due to the fill placement resulting in an overall benefit.

#### 4.1.1.3 Estuarine Water Column

Although no work is occurring directly in the estuarine water column it is possible turbidity effects resulting from work within the marine water column may impact estuarine waters upstream in the Savannah River. These impacts would be considered temporary and minor in nature.

#### 4.1.1.4 Marine Water Column

Total suspended particulate matter produced by this activity is expected to be similar to that produced by other authorized forms of dredging. These effects are expected to be temporary and minor. Temporary toe dikes will constructed parallel with the shore to control the hydraulic effluent and reduce turbidity. In addition the quality of dredged material used during this renourishment is primarily fine grained poorly graded SP sands. This material is appropriate for beach placement and should produce very little turbidity.

#### 4.1.1.5 Areas Identified Under Specific Plans for Managed Species

Federally managed species that inhabit the marine water column area offshore of Tybee Island include blue fish (*Pomatomus saltatrix*), brown shrimp (*Penaeus aztecus*), pink shrimp (*P. duorarum*), white shrimp (*P. setiferus*), cobia (*Rachycentron canadum*), dolphin (*Coryphaena hippurus*), Atlantic sturgeon (*Acipenser oxyrhynchus*) (managed by ASMFC and NOAA), red snapper (*Lutjanus campechanus),* gag grouper (*Mycteroperca microlepis*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorus maculatus*), spot (*Leiostomus xanthurus*), Summer Flounder (*Paralichthys dentatus*) and red drum (*Sciaenops ocellatus*) (SAFMC 1998; ASMFC, www.asmfc.org; accessed on 12 December 2018). A summary of managed species and their potential occurrence within the Tybee Island area is provided in Table 2.

Table 2: Summary of managed species potential occurrence in the Tybee Island area.

| **Species** | **Scientific name** | **Habitat/Occurrence in Project Area** |
|---|---|---|
| King mackerel | *Scomberomorous cavalla* | Migratory pelagic, nearshore and offshore marine |
| Spanish mackerel | *S. maculatus* | Migratory pelagic, nearshore and offshore marine |
| Bluefish | *Pomatomus saltatrix* | Migratory pelagic, nearshore and offshore marine |
| Gag grouper | *Mycteroperca microlepis* | Migratory demersal; nearshore and offshore marine; hardbottom |
| Red drum | *Sciaenops ocellatus* | Resident demersal; nearshore marine, Tybee Inlet; estuarine |
| Shrimp (brown, white and pink) | *Penaeus aztecus, P.setiferous, P. duoarum* | Migratory decapods crustacean; nearshore and offshore marine; Tybee Inlet; estuarine |
| Cobia | *Rachycentron canadum* | Migratory pelagic; nearshore and offshore marine; Adults-summer water column |
| Atlantic sturgeon | *Acipenser oxyrhynchus* | Migratory; nearshore marine; estuarine; Tybee Inlet; riverine |
| Dolphin | *Coryphaena hippurus* | Oceanic species, offshore marine; larval habitat is coastal pelagic |
| Summer Flounder | *Paralichthys dentatus* | Migratory pelagic; nearshore and offshore marine; Adults nearshore during summer months |
| Spot | *Leiostomus xanthurus* | Migratory; estuarine and marine; spawning offshore in winter; Adults nearshore in fall |
| Red snapper | *Lutjanus campechanus* | Resident demersal species; nearshore and offshore marine. Juveniles-year round softbottom. Adults-hardbottom of moderate to high relief; sloping soft-bottom area |

The South Atlantic Fishery Management Council is responsible for the conservation and management of many species found in Federal waters in the South Atlantic Region. The Council currently has fishery management plans for eight fisheries. These fisheries include: (1) Coastal Migratory Pelagics (including king and Spanish mackerel), (2) Coral, coral reef and live bottom habitat, (3) Dolphinfish and Wahoo, (4) Golden Crab, (5) Shrimp (penaeid and rock shrimp), (6) Snapper-Grouper (55 species), (7) Spiny Lobster, and (8) Sargassum. Of these fisheries Snapper-Grouper contain species that are overfished. Both the recreational and commercial snapper grouper fisheries are highly regulated and progress continues to be made as more species are removed from the overfished list each year. The other fisheries are expected to continue into the future at productive sustainable levels (www.safmc.net).

EFH for red drum includes unconsolidated bottom and ocean high salinity surf zones. Red drum migrate inshore to spawn in the spring and offshore to wintering grounds during the fall. Spawning occurs primarily in the nearshore area during late September/October. Eggs and pelagic larvae utilize high salinity waters inside estuaries. Juveniles utilize a variety of inshore habitats including oyster reefs and unconsolidated bottom. Sub-adults are found throughout southeastern estuaries.

During fall migrations, adults use hard/live bottom areas and artificial reefs off South Carolina and Georgia (www.asmfc.org).

EFH for bluefish and summer flounder includes coastal waters over the Continental Shelf and inshore waters. Summer flounder adults are likely to be present in the area during the summer months and move offshore to depths of 500 feet or more during winter months. Bluefish migrate south when water temperatures drop. Spawning occurs in open ocean waters when temperatures are between 18 – 22 degrees Celsius. Juveniles migrate from the continental shelf to nearshore waters as they develop. Juveniles are more common in the Mid Atlantic Bight than the South Atlantic Bight as they prefer sandy substrates over silts and clays. Adults use both offshore and inshore areas for foraging but favor warmer temperatures. The proposed renourishment is scheduled to occur during November 2019 to April 2020 which would prevent impacts to spawning populations.

Brown and white shrimp (juvenile and adult) and juvenile Spanish mackerel utilize the nearshore areas of Georgia's coastal waters for feeding but are not expected to be adversely affected due to the availability of other suitable habitat nearby.

Historically Atlantic sturgeon supported commercial fisheries of varying magnitude. In the late 1800s, they were second only to lobster among important fisheries, with landings estimated at seven million pounds per year just prior to the turn of the century. Overharvesting of sturgeon for flesh and eggs (known as caviar) continued through the 1990s until the Commission and federal government implemented a coastwide moratorium in late 1997 and early 1998. The Commission's Fishery Management Plan for Atlantic Sturgeon called for a coastwide moratorium through at least 2038, in order to build up 20 year classes. In October 2009 the Natural Resources Defense Council (NRDC) petitioned NOAA to list Atlantic sturgeon under the Endangered Species Act (ESA) and designate critical habitat. In January 2010 NOAA Fisheries published a positive 90-day finding in the *Federal* Register. The Atlantic sturgeon was listed as endangered on April 6, 2012. This listing included five distinct population segments (DPS) one of which is the South Atlantic and Carolina population. In 2013, NOAA Fisheries published an Interim Final Rule for the threatened GOM DPS which essentially provides the same protection as an endangered listing. In April 2017, NOAA Fisheries published a final rule to designate Atlantic sturgeon critical habitat (i.e., specific areas that are considered essential to the conservation of the species) in each of the DPSs. Spawning occurs in tidal freshwater regions of large estuaries of waters where the temperatures range from 13.2 – 23 degrees Celsius. EFH for Atlantic sturgeon includes nearshore subtidal bottoms (for juveniles) (www.asmfc.org). The NMFS 1995 BO on hopper dredging and beach renourishment activities in the southeastern US from North Carolina through Florida East Coast concluded that pipeline dredges were not likely to adversely affect listed species. However no impacts to spawning populations would occur as the spawning occurs in freshwater rivers. It would not be expected that Atlantic sturgeon would commonly utilize habitats where this

project's activities would be performed, open nearshore areas of the ocean and beaches.

#### 4.1.1.6 Geographically Defined Habitat Areas of Particular Concern

These include special management zones, hard bottoms, and State-designated areas of importance to managed species, and submerged aquatic vegetation. None of these areas would be impacted by the proposed work.

## 5.0 THE DISTRICT'S VIEWS ON THE EFFECT OF THE PROPOSED WORK ON EFH

As discussed above under each type of identified EFH, when taking into account the overall effect of the proposed work, Savannah District expects the proposed renourishment to have no more than minimal negative impacts to EFH or the aquatic ecosystem and is not likely to adversely affect listed species.

## 6.0 PREVIOUS MONITORING

As part of the 2008 renourishment NMFS recommended monitoring both the fill and borrow area to document changes relative to a control area and assess long-term recovery. Savannah District coordinated this monitoring with South Carolina Department of Natural Resources and a Before After Control Impact (BACI) monitoring program was conducted to address concerns relayed by NMFS on the lack of bathymetric and benthic data in Georgia where beach renourishment occurs. Results of the monitoring are summarized below and discussed in the EA under section 4.18.

Borrow area monitoring:

- The content of fine silts and clays as well as finer silts increased in the borrow area relative to an undredged reference site and remained elevated one year after.

- Infaunal communities changed significantly following dredging but appeared to be a product of seasonal changes more so than dredging.

- Biological communities changed the greatest during the six and twelve months post-dredging period, rather than immediately after dredging in the borrow area.

- The borrow area amphipod community, which normally responds quickly in a negative manner to dredging, exhibited very little change immediately after dredging and decreased in the six and twelve month survey.

- Polychaete worm populations increased in the borrow area (an opportunistic species).

Beach monitoring:

- Beach sediment characteristics changed very little after renourishment, supporting the findings that the borrow area sediments used were of a good match to existing beach sediments.

- Little evidence was found that ghost crab populations decreased significantly in the nourished segments compared to un-nourished reference sites.

- Data suggested that adult ghost crabs avoided the areas of active renourishment and successfully recolonized the affected beach system afterward.

- A decline in juvenile ghost crabs was evident across the entire beach system though adult populations remained relatively stable.

- The small size of Tybee Island made it difficult to distinguish significant changes in ghost crab populations.

- Bean clam densities declined during renourishment.

- There was low recruitment of juvenile clams to the renourished areas during the post-nourishment monitoring period.

- During 2010 a mass mortality of bean clams and other infaunal bivalves occurred at beaches along South Carolina and Georgia. However, the study could not definitively attribute the decline to the beach renourishment.

- Declines in the bean clams may also have affected ghost crab recruitment as the clam is one of the major prey sources.

Consultation occurred 6 November 2018 with USFWS to determine if benthic monitoring is appropriate for this renourishment. Benthic monitoring was deemed unnecessary for this renourishment with the following statement issued from USFWS, "The executive summary from the SCDNR final report for the swash zone on the renourished beach for the last Tybee renourishment states: *The impact and recovery trajectories of benthic macroinfauna in response to the placement of sand on Tybee Island appear to be within the range of similar studies.*" Suspended particulate may be expected to have some adverse impact on filter feeders, but those impacts are expected to be temporary. Where appropriate, construction activities would be timed so that possible turbidity impacts to larval estuarine fish and shellfish would be minimized. To minimize these impacts, the proposed actions in this area would not take place during the critical reproductive season for estuarine fish and shellfish.

## 6.0 PROPOSED MITIGATION

Results of the last renourishment monitoring did not show significant adverse impacts to benthic organisms in the borrow area or on the beach. Based on the time of year construction is scheduled, the short duration, and the protective measures in place (type of equipment, endangered species watch plans, etc.) the Savannah District has identified no need for mitigation.

## 8.0 REFERENCES

EFH Guidance (Essential Fish Habitat: New Marine Fish Habitat Conservation mandate for Federal Agencies, National Marine Fisheries Service, Habitat Conservation Division, Southeast Regional Office, St. Petersburg, FL, February 1999).

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U.S. Department of Commerce (DOC), National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS). 2012. 77 FR 5880, Rules and Regulations, (DOC), 50 CFR Parts 223 and 224, RIN 0648-XJ00 [Docket No. 100903414-1762-02], Endangered and Threatened Wildlife and Plants; Threatened and Endangered Status for Distinct Population Segments of Atlantic Sturgeon in the Northeast Region, Part II, ACTION: Final rule.

# APPENDIX E

# 8-Step Process for EO 11988: Flood Plain Management

## TYBEE ISLAND, GEORGIA
## SHORELINE PROTECTION PROJECT
## 2019 HURRICAN HARVEY, IRMA, MARIA
## EMERGENCY SUPPLEMENTAL RENOURISHMENT

**U.S. ARMY CORPS OF ENGINEERS**
**SAVANNAH DISTRICT**

**APRIL 2019**

# 8-Step Process for
# EO 11988: Flood Plain Management
# Tybee Island Shoreline Protection Project
# 2019 Hurricane Harvey, Irma, Maria
# Emergency Supplemental Renourishment

Decision Process for Executive Order (EO) 11988 as Provided by 24 CFR §55.20
E.O. 11988 requires Federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of flood plain development wherever there is a practicable alternative.

## Step 1: *Determine whether the action is located in a 100-year flood plain (or a 500-year flood plain for critical actions).*

Since the proposed action is located on a barrier island, the entire island is inherently located within a 100-year flood plain.

As a barrier island, this action is designed to protect existing resources (both natural and man-made) within the 100-year flood plain. This project, as designed will protect the existing dune ecosystem from future storm damage.

## Step 2: *Notify the public for early review of the proposal and involve the affected and interested public in the decision making process.*

Savannah District has coordinated this project with Federal and State resources agencies and the interested public and issued a Notice of Availability of the draft Environmental Assessment (EA) in order to:

- Inform agencies and individuals of the proposed work and the environmental evaluation contained in the draft EA, and
- Provide an opportunity for comments on that evaluation and findings.

## Step 3: *Identify and evaluate practicable alternatives.*

**No Action Alternative (NAA)**: The NAA (Alternative A) would result in continued erosion to the Tybee Island Shore Protection Project (an authorized Federal project), including the loss of property and structures, as well as the dune ecosystem. Since December 2008 an average loss of approximately 164,000 cy/yr has occurred on the oceanfront beach. The majority of erosion occurred at the Second Street “hot spot” with a lesser degree of erosion in the vicinity of the Tybrisa Pier. With no renourishment, the beach would continue to erode, with a concomitant loss in storm damage protection and recreational benefits. In addition, if

erosion were to be allowed to continue unimpeded, seawall and dune damage would be expected to occur at an accelerated rate.

**Action Alternatives**: Under both of the two action alternatives, this barrier island dune ecosystem would be protected and enhanced from past and future storm damages. The proposed action (Alternative C) is almost identical to Alternative B, differing only by the addition of dune construction within the Federal project. This dune construction will occur throughout the federal footprint to tie together existing dune communities, fill in hotspot (flood prone) areas, and build resiliency into the federal project.

Therefore, Alternative C will be more effective in providing protection to existing development (homes and commercial real estate) within the flood plain on this barrier island (it does not include additional developments within the flood plain). In addition, Alternative C for this project would protect, enhance, and maintain the ecological functions of the sand dune ecosystem, with consequential benefits to the native flora and fauna that inhabit this ecosystem. Benefits to flora and fauna as detailed in Section 4.7.

## Step 4: *Identify Potential Direct and Indirect Impacts Associated with Flood Plain Development.*

This proposed emergency supplemental funds renourishment is within the same footprint and will use similar techniques and equipment as to what has previously been performed at Tybee Island during the first periodic renourishment in 1987 by the Savannah District, the subsequent 1995 work by Georgia Ports Authority (GPA), and the USACE renourishments in 2000, 2008, 2015 and 2018. In addition to the routine renourishment practices, dune construction will occur throughout the federal footprint to tie together existing dune communities, fill in hotspot (flood prone) areas, and build resiliency into the federal project. All previous renourishments at Tybee Island received all of the required environmental approvals.

This project will be in compliance with all environmental laws; and all environmental approvals/requirements will be contained within the Final EA. Unavoidable adverse impacts to benthic communities would occur as a result of the proposed project, but this would only be a temporary effect. Individual organisms within the benthic communities would be temporarily lost as a result of the proposed renourishment activities. However, benthic organisms would be expected to recolonize the beach resulting in no long term adverse impacts.

A minimum dune crest width of 15 feet matching existing dunes is recommended allowing for construction of dunes within the Federal foot print and maintaining a distance from the edge of the berm that will prevent erosion to the dunes from wave action. Vegetation would be planted on the dunes for stabilization and sand fencing would be placed at the toe of the dune to limit pedestrian traffic.

Overall, the adverse environmental impacts of implementing the proposed action are expected to be minor in scope and temporary in duration. All of the beneficial environmental impacts of implementing the proposed action are expected to be long term in duration. These beneficial impacts include protecting, enhancing, and maintaining the ecological functions of the sand dune ecosystem, with consequential benefits to the native flora and fauna that inhabit this ecosystem, as detailed in Section 4.

Since all of the components of the proposed action are designed to optimize protection of existing human development and ecological functions within the flood plain, no long term adverse flood plain impacts have been identified in this NEPA study. In further compliance with this Executive Order, the proposed action avoids direct and indirect support of additional flood plain development.

## Step 5: *Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the flood plain and to restore, and preserve the values of the flood plain.*

Since all of the components of the proposed action are designed to protect this barrier island from the loss of existing property, structures, human life, and the ecological functions of the existing dune ecosystem, there are no adverse flood plain impacts to minimize.

## Step 6: *Reevaluate the Alternatives.*

Although this project is located within a flood plain, the project is designed to protect all existing flood plain property values and ecological values.

The no action alternative is impracticable because it will not satisfy the need to prevent adverse impacts to existing property, structures, human life, and the ecological functions of the existing dune ecosystem.

## Step 7: *Determination of No Practicable Alternative*

It is our determination that there is no practicable alternative for locating the project out of the flood zone. Since Tybee Island is a barrier island, the entire island is inherently located within the flood plain. Therefore, all of the resources (both man-made and natural) to be protected are all located within the flood plain.

A final notice will be published during the public review of the project documents.

## Step 8: *Implement the Proposed Action*

USACE will assure that this plan is executed and necessary language will be included in all agreements with participating parties. USACE will also take an active role in monitoring the construction process (as described above) to ensure no unnecessary impacts occur nor unnecessary risks are taken.

# APPENDIX F

# REAL ESTATE SUMMARY

# TYBEE ISLAND, GEORGIA
# SHORELINE PROTECTION PROJECT
# 2019 HURRICAN HARVEY, IRMA, MARIA
# EMERGENCY SUPPLEMENTAL
# RENOURISHMENT



# U.S. ARMY CORPS OF ENGINEERS
# SAVANNAH DISTRICT

# APRIL 2019

# REAL ESTATE SUMMARY

## Table of Contents



### Figures

## SECTION 1. THE REAL ESTATE REPORT

### 1.1 Statement of Purpose

This Environmental Assessment (EA) and Finding of No Significant Impact Report (FONSI) demonstrates that incorporating existing dunes, repairing damaged dunes that were damaged by major storm and meteorological events (i.e., Nor'easter events) and constructing dunes all within the Tybee Island Shoreline Project are consistent with the project purposes and meet the requirements of the Hurricanes Harvey, Irma and Maria Supplemental (HIM Sup) authorization for construction. Tybee Island Shoreline Protection Project (TISPP) is a Federally-designed and constructed Coastal Storm Risk Management project to reduce risk from waves, erosion, and inundation within the Tybee Island Shoreline Protection Project area. The recommended plan presented in the Feasibility Report was selected as the plan that "maximized National Economic Development (NED) benefits" and has no explicit or implied "level of protection" associated with it.

The Real Estate Appendix is intended to support the detailed Environmental Assessment and Finding of No Significant Impact Report for the project. The author of this report is familiar with the Project area. The City of Tybee Island is the non-Federal sponsor for the project. Date of this report is March 2019.

### 1.2 Project Authorization

The Federal TISPP was authorized in June 1971 by Senate and House resolutions pursuant to Section 201 of the Flood Control Act of 1965 (Public Law (PL) 89-298), as presented in House Document No. 92-105, for a life of 10 years. Section 201 provided a procedure for authorization of projects with, at that time, an estimated Federal first cost of construction of less than $10 million. The authorizing language reads as follows:

*"RESOLVED BY THE COMMITTEE ON PUBLIC WORKS OF THE UNITED STATES SENATE, That pursuant to the provisions of Section 201 of Public Law 298, Eighty-ninth Congress, (79 Stat. 1073; 42 U.S.C. 1962d-5) the project providing for beach erosion control on Tybee Island, Georgia, is hereby approved substantially in accordance with the recommendations of the Secretary of the Army and the Chief of Engineers in House Document Numbered 105, Ninety-second Congress, at an estimated cost of $404,000."*

The authority for Federal participation in periodic nourishment of beach projects was increased from 10 years to 15 years by Section 156 WRDA 1976, which reads as follows:

*"The Secretary of the Army, acting through the Chief of Engineers, is authorized to provide periodic beach nourishment in the case of each water resources development project where such nourishment has been authorized for a limited period for such additional periods as he determines necessary but in no event shall such additional period extend beyond the fifteenth year which begins after the date of initiation of construction of such project."*

Section 934 of WRDA 1986 modified Section 156 of WRDA 1976 by extending the authority for Federal participation in periodic nourishment from 15 years to 50 years and reads as follows:

*"Section 156 of the Water Resources Development Act of 1976 (42 U.S.C. 1962d-5f) is amended by striking out "fifteenth" and inserting in lieu thereof "fiftieth."*

Following the passage of WRDA 1986, a "Section 934" report was prepared which concluded that the authorized Federal project for Tybee Island was economically feasible under the current policy and economic guidelines, and the project should be extended for the remaining life of 30 years (from 1994). The study was initiated in 1990, completed in October 1994 and the "Tybee Island Beach Erosion Control Project, Section 934 Reevaluation Report" was approved in June 1995. Accordingly, the project life of the Tybee Island project was established in September 1974, with the initiation of construction of the North Terminal Groin and Federal participation in the project cost sharing. The project will terminate in September 2024.

The TISPP was further modified by Section 301 of WRDA 1996, which amended the authorized project as follows:

*"The project for beach erosion control, Tybee Island, Georgia, authorized pursuant to section 201 of the Flood Control Act of 1968 (42 U.S.C. 1962d-5; 79 Stat. 1073-1074) is modified to include as an integral part of the project the portion of Tybee Island located south of the existing south terminal groin between 18th and 19th Streets, including the east bank of Tybee Creek up to Horse Pen Creek."*

By letter dated 14 March 1997, Headquarters, US Army Corps of Engineers (HQUSACE) authorized a study to determine if the South Tip Beach and Tybee Creek up to Horse Pen Creek should be added to the authorized TISPP. The "Special Report on South Tip Beach/Tybee Creek" was completed in May 1998 in response to this authority and was approved by HQUSACE in August 1998. The report recommended extending the southern limits of the authorized project for an additional 1,100 feet to provide protection for structures along the South Tip and another 1,800 feet to provide protection to the eastern bank of the Back River/Tybee Creek. Another name for Tybee Creek is Back River. Both names are used throughout this report due to the long history of addressing this area by both names.

Currently a Beach Renourishment Evaluation Study is taking place evaluating the feasibility of extending the period of nourishment an additional 15 years beyond the 50 year completion of the TISPP. Section 1037 of WRDA 2014 extending the authority for Federal participation in periodic renourishment an additional 15 years beyond the 50 year completion reads as follows:

*"to provide that, at the request of the non-Federal interest, the Secretary shall carry out, for any coastal storm risk management project for which periodic renourishment is authorized for a maximum period of 50 years, a study to determine the feasibility of extending the period of nourishment for a period not to exceed 15 additional years beyond the 50 year maximum period of federal participation in cost shared renourishment"*

The TISPP, City of Tybee Island, Chatham County, Georgia, HIM Sup was authorized in the Bipartisan Budget Act of 2018 (PL 115-123), Division B, Subdivision 1, Title IV. PL 115-123 provides Construction funding to address emergency situations at Corps of Engineers projects, and to construct, and to rehabilitate and repair damages caused by natural disasters to Corps projects.

### 1.3 Project Description

Tybee Island, Georgia, is one of a series of barrier islands lying along the Atlantic coast from Florida to North Carolina. The island is located about 18 miles east of the city of Savannah, Chatham County, Georgia. It is bounded on the north by the Savannah River, to the east by the Atlantic

Ocean, and on the south and west by Tybee Creek and a vast tidal marsh system. **Figure 1: Tybee Island Shoreline Protection Project Map**

The authorized project for Tybee Island consists of renourishment of 13,200 linear feet of beach between two terminal groins (referred to as Front Beach); construction of a groin field along 1,100 linear feet of shoreline from the southern terminal groin around the South Tip to the mouth of Tybee Creek (also known as Back River) including periodic renourishment (referred to as South Tip Beach); and construction of a groin field and renourishment of 1,800 linear feet of the eastern bank of Tybee Creek to the city fishing pier (referred to as Back River Beach). The remaining shoreline from the fishing pier to the mouth of Horse Pen Creek, although included in the authorizing language of WRDA 1996, is relatively stable at this time and no renourishment has occurred. Due to variable erosion rates along the project, some areas of the beach require significantly more advance renourishment than other areas. **Figure 2: Project Features**

Front Beach:

A substantial dune system exists from stations 00+00 to 35+00 and from 55+00 to 110+00. The area between stations 35+00 to 55+00, in the proximity of Center Street, and stations 110+00 to 125+00, south of Tybrisa Pier, are known as the “hot spots”. Stations 35+00 to 55+00 historically has had the highest erosion rate on the project and no dunes exists in this area. Stations 55+00 to 110+00 has a high erosion rate and before Hurricane Matthew a substantial dune system existed in this area. Major storm and meteorological events since 2016 have caused the dunes in this area to erode into the berm. Error! Reference source not found.

South Tip Beach:

South Tip Beach incurred a 50’ wide breach in the construction template during Hurricane Matthew along with erosion to existing dunes. Surveys after Hurricane Irma showed an increase in the breach and continued erosion of the dunes into the berm. A field examination in October of 2018 shows the breach has exposed the dunes to continuous erosion from wave action and is feeding the berm. **Figure 3: South Tip Dune Erosion**

Back River Beach:

The Back River Beach has minimal dunes within the limits of the Federal Project. However, a dune system exits outside of the Federal Project in this area. Portions of the Back River Beach renourishment area has limited Real Estate and high erosion rates.


**Figure 1: Tybee Island Shoreline Protection Project Map**

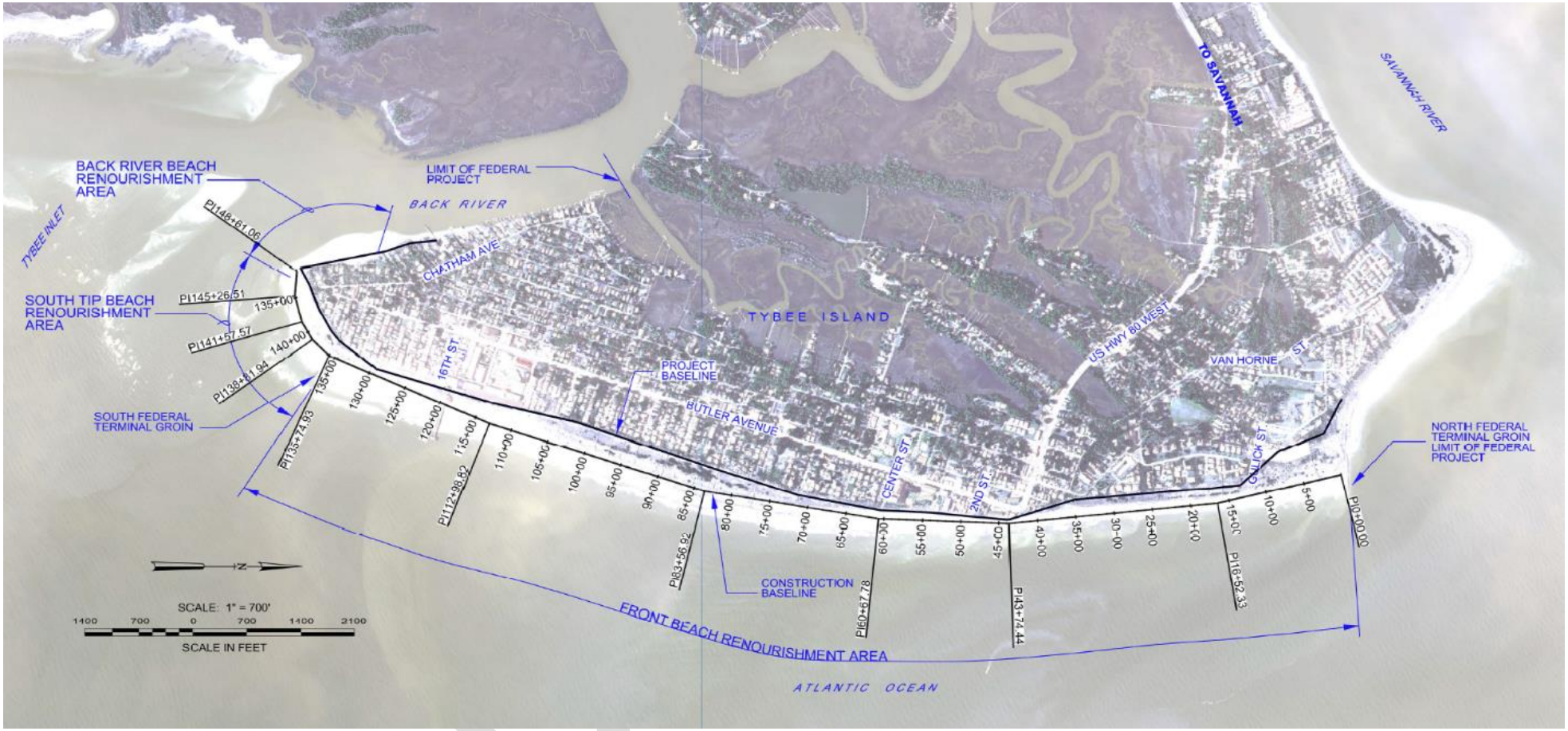


**Figure 2: Project Features**


**Figure 3: South Tip Dune Erosion**

Borrow Site:

Material to be placed on the beach will be obtained from a newly expanded offshore borrow area located approximately one mile off the coast of Tybee Island. In general, the sediment consists of light gray to light brownish gray, well graded (poorly sorted), fine sized sand with a shell content of approximately 8%. The average percentage of fines (sediment passing the No. 200 sieve) was 3.27%., which is well within the state requirement of less than 10%. In addition, the shell content was within the state requirement of less than 15% of total volume. **Figure 4: Tybee Island Borrow Area**

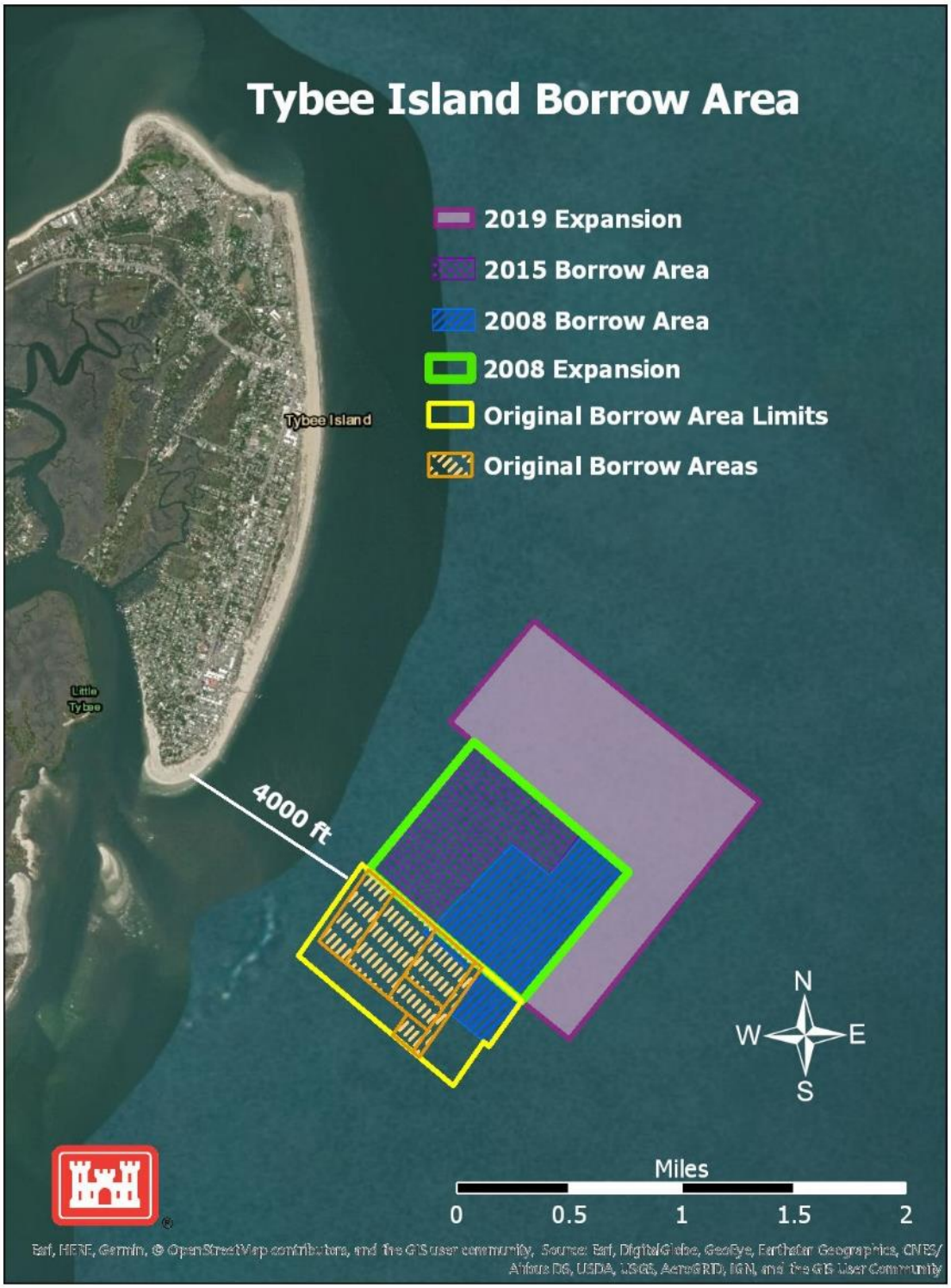


**Figure 4: Tybee Island Borrow Area**

## 1.4 Real Estate Requirements

All lands needed for construction of the Tybee Island Beach Erosion Control Project are sponsor owned. The State of Georgia granted a perpetual easement to the City of Tybee Island for the planning, construction, installation, operation, maintenance, repair and renourishment of beachfront lands claimed by the State of Georgia. Beach fill material used during the renourishment cycles came from the Savannah Harbor Navigation Channel and Borrow Areas 3 and 4. The City of Tybee Island and the State of Georgia entered into a Non-Exclusive Intergovernmental Mineral License for the life of the project to allow for the removal of sand from the offshore borrow areas.

A Special Report on South Tip Beach/Tybee Creek approved in August 1998 extended the project by 1,100 feet to provide protection for structures along the South Tip and another 1,800 feet to provide protection to the northern bank of the Tybee Creek. The City of Tybee acquired perpetual storm damage reduction easements over the 17 private properties to allow for construction and periodic nourishment of the 1,800 feet section of Tybee Creek (Back River).

For the 2008 renourishment cycle, Borrow Area 4 was enlarged and on April 23, 2008, the Non-Exclusive Intergovernmental Mineral License was amended to allow for the expansion of Borrow Area 4. The Mineral License will be amended once again for the expansion of the off shore Borrow Area 4 to supply material for this Shore Protection Project. The City of Tybee would have to execute the 2nd Amendment to the Mineral License before the construction efforts begins. Also, as a result of the changes to the project and the 2nd Amendment to the Mineral License, the City of Tybee Island will need to sign a new Authorization for Entry for Construction and Attorneys Certificate of Authority.

There are 22 public access points throughout the linear foot print of the project. All access points are public right of way. There are metered or pay parking lots located at each access point.

All fill material proposed for this renourishment cycle is to be placed within the footprint of the original project areas. No additional pipeline easements are necessary as the pipeline from the dredge will remain within sponsor owned lands, the easement areas or below mean high water. Parking areas and road ends that provide public access were used as staging areas during all previous projects and will be used again for this nourishment cycle.

## 1.5 Utility/Facility Relocation

There are no utility/facility relocations associated with this project

## 1.6 Existing Projects

A Section 1037 Beach Renourishment Evaluation Study to extend Federal participation in the Tybee Island Shoreline Protection Project is ongoing and will include the recommended modifications to the Federal Project if accepted.

## 1.7 Environmental Impacts

The environmental impacts are addressed in the Environmental Documentation and Coordination of the main report.

## 1.8 Project Sponsor Responsibilities and Capabilities

The City of Tybee Island, Georgia is the non-Federal Project Sponsor (NFS). The NFS has the responsibility to acquire all real estate interests required for the Project. The NFS shall accomplish all alterations and relocations of facilities, structures and improvements determined by the government to be necessary for construction of the Project. The sponsor will have operation and maintenance responsibility for the project after construction is completed.

No new land acquisition is required for this project, except for the Mineral License reference above in Section 1.4. Consequently the usual requirements for the NFS pertaining to real estate acquisition are not applicable.

## 1.9 Government Owned Property

The City of Tybee Island NFS owns the beach land. The State of Georgia is owner of the Borrow Area 4. The City of Tybee Island and the State of Georgia entered into a Non-Exclusive Intergovernmental Mineral License for the life of the project to allow for the removal of sand from the offshore borrow areas. There is no Federally owned land within the areas proposed for construction of the project.

## 1.10 Historical Significance

Several remote sensing archaeological investigations have been conducted in the past to identify historic properties in the off-shore borrow area.

## 1.11 Mineral Rights

There are no known mineral activities within the scope of the proposed project.

## 1.12 Hazardous, Toxic, and Radioactive Waste (HTRW)

There are no known HTRW contaminants in the project area.

## 1.13 Navigation Servitude

Navigation Servitude is not applicable to this project.

## 1.14 Zoning Ordinances

Zoning ordinances are not of issue with this project. Application or enactment of zoning ordinances is not to be used in lieu of acquisition.

## 1.15 Induced Flooding

There will be no flooding induced by the construction or the operation and maintenance of the project.

## 1.16 Public Law 91-646, Relocation Assistance Benefits

There are no relocations of individuals, businesses or farms for this project.

### 1.17 Attitude of Property Owners

The project is fully supported. There are no known objections to the project from landowners within the project area.

### 1.18 Acquisition Schedule

The project sponsor is responsible for acquiring real estate interests required for the project. It is anticipated that the Amendment to the Mineral License can be accomplished within 3-6 months, and can begin when borrow expansion plans and specs have been completed. The Project Sponsor, Project Manager and Real Estate Technical Manager will formulate the milestone schedule upon project approval to meet dates for advertisement and award of a construction contract.

### 1.19 Real Estate Estimate

The real estate requirements are minimal for this project.

| | |
|---|---|
| Non Federal | $2,500 |
| Federal | $1,000 |

### Exhibits

Exhibit A - Authorization For Entry For Construction and Attorney's Certificate of Authority

## AUTHORIZATION FOR ENTRY FOR CONSTRUCTION

I _____, _____ for the
(Name of accountable official) (Title)

**(**Sponsor Name**)** ___, do hereby certify that the (Sponsor Name) has acquired the real property interest required by the Department of the Army, and otherwise is vested with sufficient title and interest in lands to support construction for (Project Name, Specifically identified project features, etc.). Further, I hereby authorize the Department of the Army, its agents, employees and contractors, to enter upon _____
(identify tracts)

to construct (Project Name, Specifically identified project features, etc.) as set forth in the plans and specifications held in the U. S. Army Corps of Engineers' (district, city, state)

WITNESS my signature as _____ for the
(Title)

(Sponsor Name) this _____ day of _____, 20_____.

BY: _____
(Name)

_____
(Title)

## ATTORNEY'S CERTIFICATE OF AUTHORITY

I, _____ , _____ for the
(Name) (Title of legal officer)

(Sponsor Name), certify that _____ has
(Name of accountable official)

authority to grant Authorization for Entry; that said Authorization for Entry is executed by the proper duly authorized officer; and that the Authorization for Entry is in sufficient form to grant the authorization therein stated.

WITNESS my signature as _____ for the
(Title)

**(**Sponsor Name**)**, this_____day of_____, 20___.

BY: _____
(Name)

_____
(Title)

**Exhibit A**

# APPENDIX G

# PUBLIC COMMENTS
# AND
# CORPS RESPONSES

# TYBEE ISLAND, GEORGIA
# SHORELINE PROTECTION PROJECT
# 2019 HURRICAN HARVEY, IRMA, MARIA
# EMERGENCY SUPPLEMENTAL
# RENOURISHMENT

# U.S. ARMY CORPS OF ENGINEERS
# SAVANNAH DISTRICT

# APRIL 2019

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