

JUNE 2017

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# **ENVIRONMENTAL ASSESSMENT**

## **OPERATIONS AND MAINTENANCE DREDGING PLACEMENT OF DREDGED MATERIAL IN OFFSHORE BORROW AREA**

**ST. LUCIE INLET  
MARTIN COUNTY, FLORIDA**



U.S. Army Corps  
of Engineers  
Jacksonville District

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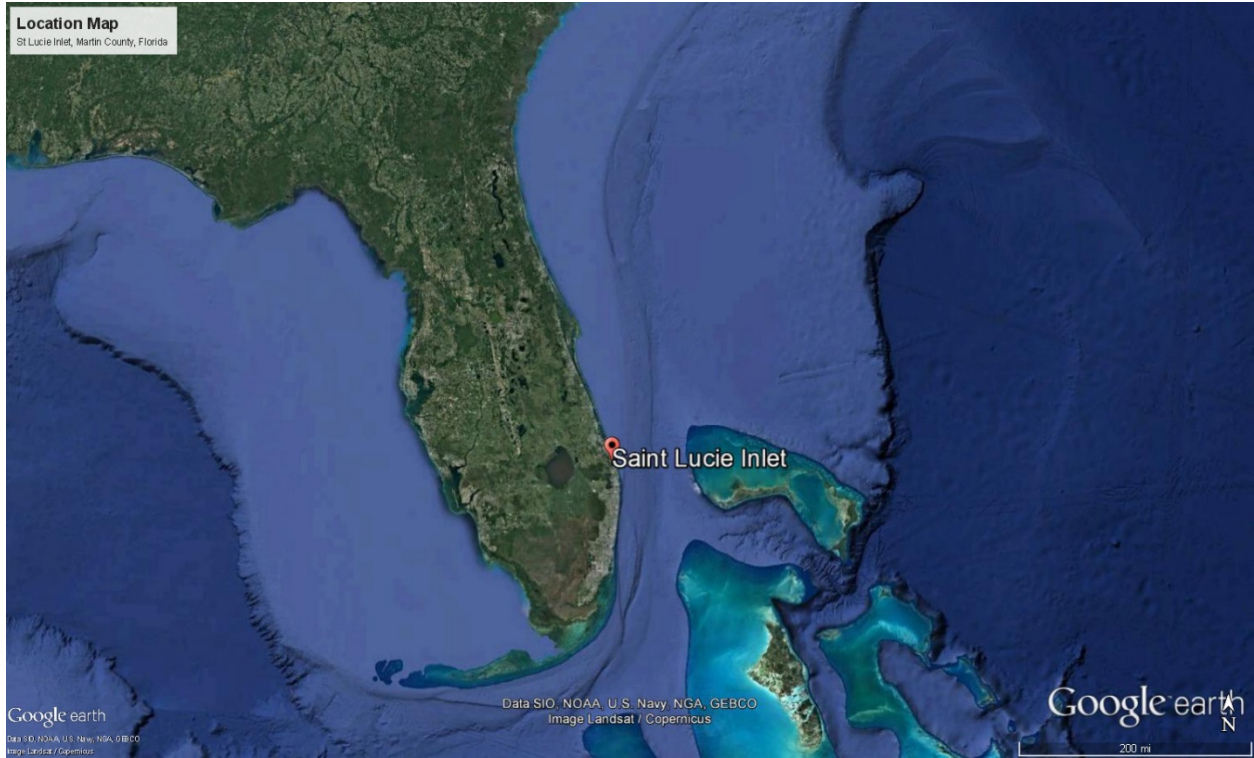
**ENVIRONMENTALASSESSMENT  
ST. LUCIE INLET  
OPERATIONS AND MAINTENANCE DREDGING**

**1 PROJECT PURPOSE AND NEED**

**1.1 PROJECT DESCRIPTION**

The U.S. Army Corps of Engineers (USACE), Jacksonville District proposes to dredge the St. Lucie Inlet entrance channel, and impoundment basin, any time of the year and on an “as-needed” basis in order to maintain safe navigation in the channel. The work would consist of routine operations and maintenance (O&M) dredging of an estimated 400,000 cubic yards of sand from portions of the entrance channel and impoundment basin as needed. The channel is 300 feet wide and 18 feet deep, tapering to 150 feet wide and 12 feet deep, and then to 100 feet wide and 9 feet deep. The approximate length of the project is 9,200 feet. The impoundment basin is 450 feet by 2,500 feet and will be dredged to a required depth of 13 feet. Shoal material will be placed either in the 10,000-foot nearshore disposal area located approximately 10 miles south of St. Lucie Inlet between State Monuments R-89 and R-99, in a previously used beach disposal area located 4,000 feet south of the inlet and extending for 10,000 feet further south; and/or within a 562 acre offshore disposal area identified as “Borrow Area B” (Figure 3). This borrow area is located offshore Jupiter Island, approximately between R-109 and R-118 as depicted in Figure 1 and Figure 2. Use of Borrow Area B would allow for storage of dredged material that may be utilized by others for future nourishment/renourishment events. The frequency of use of the offshore disposal site would coincide with the maintenance dredging frequency of every three to five years or as needed due to weather related shoaling.

If material is not placed in Borrow Area B, the staging areas developed as part of the Peck’s Lake placement shall be utilized for beach renourishment.



*Figure 1 - Vicinity Map*



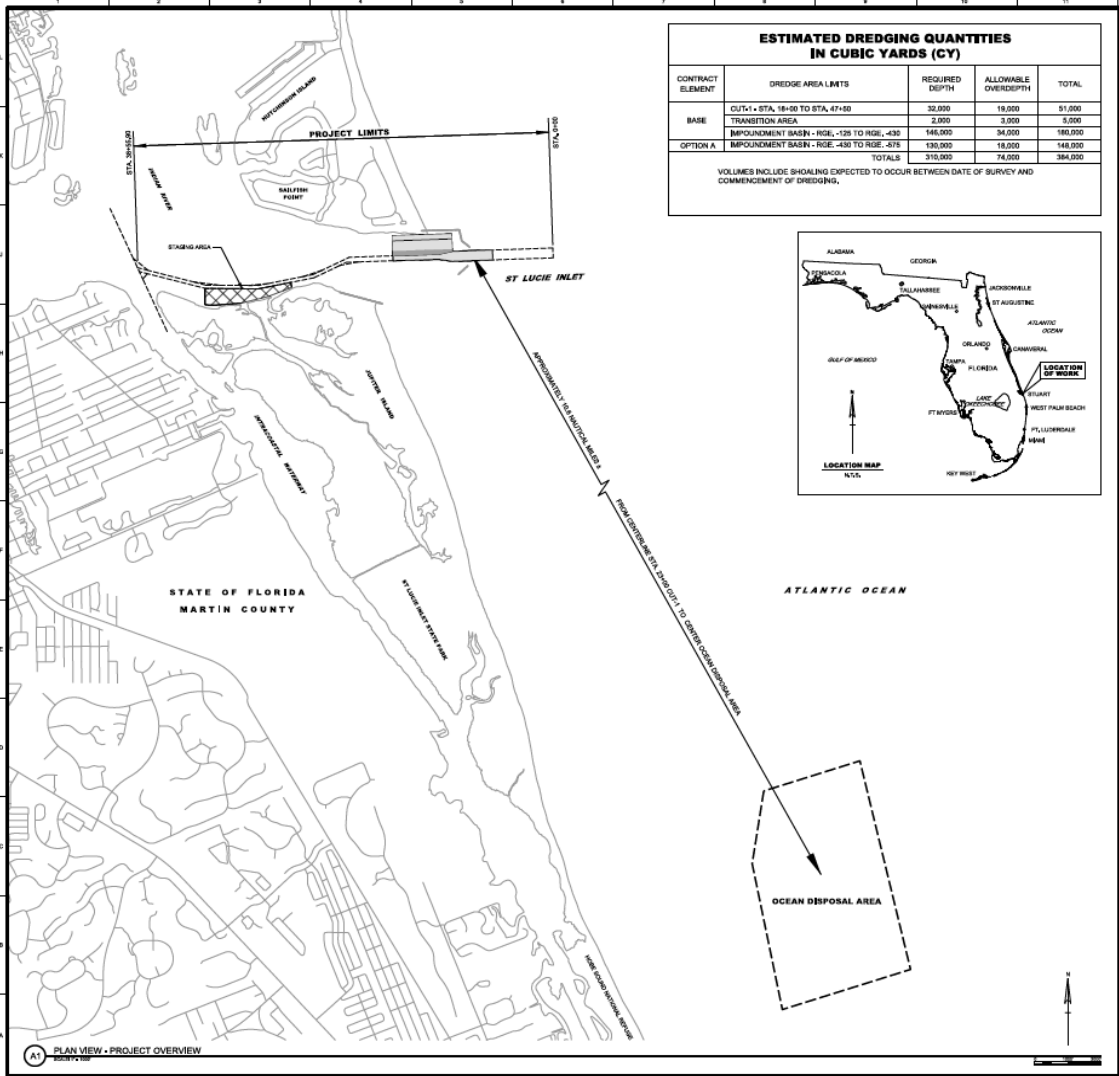


Figure 2 - Location Map (Not to Scale)

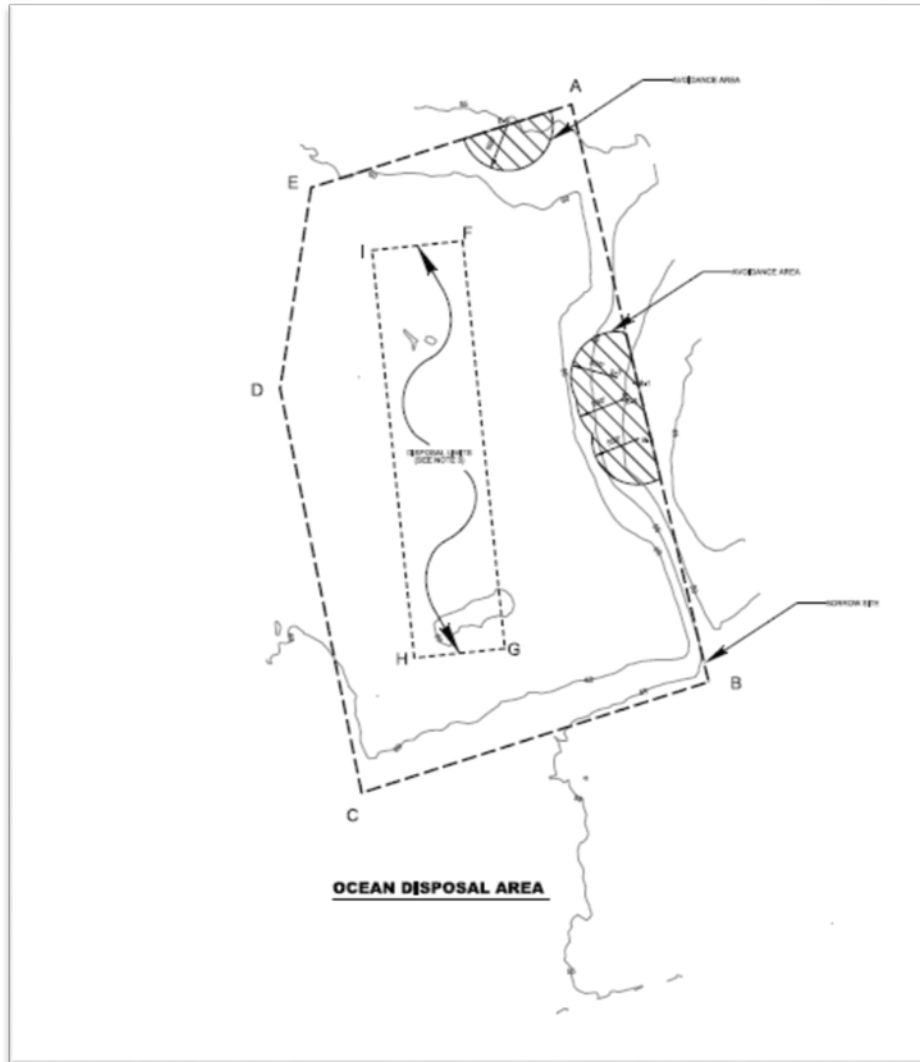


Figure 3 - Dredged Material Placement Area within Borrow Area B

## 1.2 PROJECT NEED OR OPPORTUNITY

The accumulation of sediment, commonly referred to as shoaling, has restricted the width of the project channel and reduced its depths, hindering safe and efficient vessel navigation. Periodic dredging is required to remove accumulated sediments and, thus, maintain the channel at its federally authorized depth. This Supplemental Environmental Assessment (EA) will evaluate an additional opportunity to beneficially utilize the dredged material as part of the USACE Regional Sediment Management Program. The Supplemental EA will discuss dredged material placement into an existing borrow area utilized by local entities as a sand source for beach nourishment, and other items, as an update to previous analyses conducted under the National Environmental Policy Act (NEPA).

## 1.3 PROJECT AUTHORITY

Authorization for this project is provided by the Harbor and River Act of 31 May 1974, House

Document 294/93/1.

#### **1.4 RELATED ENVIRONMENTAL DOCUMENTS**

Related NEPA, design, and planning reports for the St. Lucie Inlet Federal navigation project, Martin County, FL includes the following documents:

- Maintenance Dredging, St. Lucie Inlet, Martin County, Florida, Environmental Assessment. USACE. September 1994
- St Lucie Inlet Design Memorandum and Final Environmental Assessment. St Lucie Inlet, Martin County, Florida. USACE May 2000.
- Utilization of Peck's Lake Staging Area, Operations and Maintenance Activities. St Lucie Inlet, Martin County, Florida. USACE. December 2011.
- Martin County, Florida. Hurricane and Storm Damage Reduction Project. Final Limited Reevaluation Report and Final Environmental Impact Statement. October 2011.
- Memorandum for Record, Department of the Army Environmental Assessment and Statement of Finding for Permit Application SAJ-1996-5620(MOD-LCK), issued May 4, 2017.

All of the previously listed NEPA documents for the St. Lucie Inlet Federal navigation project can be located on the USACE-Jacksonville District Environmental Documents website. <http://www.saj.usace.army.mil/About/Divisions-Offices/Planning/Environmental-Branch/Environmental-Documents/>. To access any of them, click on the "+" sign next to Martin County and scroll down to the row listed as "St. Lucie Inlet O&M." Each of the documents is listed there and available for review and download.

#### **1.5 DECISION TO BE MADE**

This Supplemental EA updates the assessment completed in September 1994, *St. Lucie Inlet, Martin County, Florida, Environmental Assessment/Finding of No Significant Impact*. Updates include, but are not limited to, newly proposed dredged material placement location (refer to Section 1.1) and revised resource analyses, incorporating data and information from the 2011 and 2017 EAs and 2011 Environmental Impact Statement (EIS).

#### **1.6 SCOPING AND RELEVANT ISSUES**

- 1994 EA – A public notice was published on July 21, 1994 and circulated to applicable Federal, state, and local agencies, and interested non-governmental organizations (NGOs). Comments were accepted through August 19, 1994. Comments received during the public notice were incorporated into the EA prior to the signature of the Finding of No Significant Impact (FONSI) on September 12, 1994.
- 2000 EA – A scoping letter was sent to interested Federal, state, and local organizations and individuals on May 7, 1998. A FONSI was signed on June 8, 2000.
- 2011 EA – A notice of availability of the draft EA was published on October 26, 2011. Comments were accepted through November 29, 2011. A FONSI was signed on December 7, 2011. A Record of Environmental Consideration was also completed on this EA, dated October 25, 2011.

- 2017 Memorandum for the Record/Statement of Findings for Regulatory Permit #SAJ-1996-5620(MOD-LCK). A public notice was published on January 22, 2016. Comments were received from National Marine Fisheries Service, Habitat Conservation Division (NMFS-HCD), and the State Historic Preservation Officer (SHPO). USACE responded to both sets of comments and the comments were incorporated into the permit, where applicable. The permit modification was issued on May 4, 2017.

#### 1.6.1 RELEVANT ISSUES.

The following issues were identified as relevant to the proposed action; placement of operations and maintenance (O&M) material into Borrow Area "B," and appropriate for further evaluation: sediment characteristics; fish and wildlife resources; threatened and endangered species; wildlife refuges and sanctuaries; essential fish habitat; water quality; noise; aesthetics, recreation; socioeconomics; navigation and public safety; cultural resources; and cumulative effects. Many of these issues have been reviewed in the previous NEPA analyses conducted between 1994 and 2017. A summary of these reviews are included in Table 1.

#### 1.6.2 ISSUES ELIMINATED FROM FURTHER ANALYSIS.

No issues were specifically identified for elimination.

Table 1 - Summary of Environmental Factors Evaluated in NEPA Documents Prepared in 1996, 2000, 2011, and 2017.

NEPA DOCUMENT ENVIRONMENTAL FACTOR	1994 EA	2000 EA	2011 EA	2017 EA/SOF
SEDIMENT CHARACTERISTICS	St. Lucie Inlet material is fine to coarse calcareous and quartz sand having a grain size range from 0.07 to 10 millimeters (mm). The amount of fine material for the inlet is less than five percent.	Not evaluated	Dredging of up to 600k cubic yards of beach quality sand from the St Lucie Inlet and impoundment basing with placement on the downdrift beach.	Beach quality sand in dredging areas and the mean grain size of borrow site "B" is between 0.28mm and 0.46mm.
ARCHAEOLOGY/ CULTURAL RESOURCES	No adverse effect. Consultation conducted. No response from SHPO.	The proposed action at St. Lucie Inlet would not affect significant historic properties. The SHPO concurred with this determination	No adverse effect to known historic properties.	In comments dated February 16, 2016, SHPO stated that the proposed project activities are unlikely to affect historic properties if the specific conditions are followed. Consultation with SHPO was also completed for DA permit SAJ-1992-01740(MOD) dated November 13, 2015, for the Town of Jupiter Island for utilizing Borrow Area B. Special condition to be included in the project – "No sand borrowing or transfer work should be allowed to occur within a 500-foot radius of the anomalies, or their respective clusters recorded in the 1989 magnetometer survey of Borrow Area B (Florida Master Site File # 2115). The 500-foot radii should be delineated by marker buoys"
AIR QUALITY	Not evaluated	No air quality permits would be required for this project	Not evaluated	Not evaluated

NEPA DOCUMENT ENVIRONMENTAL FACTOR	1994 EA	2000 EA	2011 EA	2017 EA/SOF
THREATENED AND ENDANGERED SPECIES	No effect with implementation of standard protection conditions.	U.S. Fish and Wildlife Service (FWS) concurred with USACE's may affect, but not likely to adversely affect species determinations under their jurisdiction or manatee critical habitat on February 24, 1998. NMFS concurred with USACE's may affect, not likely to adversely affect species under their jurisdiction on August 24, 1999.	May affect, but not likely to adversely affect, with implementation of standard protection measures.	Consultation completed under the South Atlantic Regional Biological Opinion (NMFS), the Statewide Programmatic Biological Opinion (FWS) and the Piping Plover Programmatic Biological Opinion (FWS). Terms and conditions from all three biological opinions incorporated into the project
ESSENTIAL FISH HABITAT (EFH)	Not evaluated (pre-dates consultation on EFH).	Not evaluated	No significant adverse effects to estuarine water column and unconsolidated substrate.	No significant adverse impacts to estuarine water column and unconsolidated substrate.
WILDLIFE REFUGES & SANCTUARIES	Beach placement on St. Lucie Inlet State Park (SLISP) and the northern 0.5 mile of the Hobe Sound National Wildlife Refuge (HSNWR). Beneficial effects to wildlife in these protected areas and continuation of recreational benefits.	Beach placement on SLISP and the northern 0.5 mile of the HSNWR. Beneficial effects to wildlife in these protected areas and continuation of recreational benefits.	Beach placement to occur HSNWR (R59 to R-69) or within the previously authorized placement areas in SLISP and northern portion of HSNWR.	Beach placement to occur within HSNWR and SLISP.
BENTHIC RESOURCES	No effect.	Benthos temporarily affected. Rapid recovery of populations expected.	No adverse effects as avoidance measures are in place.	Sediment deposition from the temporary placement of sand at Borrow Area B will result in burial of subtidal unconsolidated sediment. Soft bottom communities will also become buried, smothering infauna that may be food source for fish and other marine life. Organisms living in the nearshore sand areas are adapted to increased turbidity and unstable substrate conditions with tidal currents. Rapid recovery of populations expected.

NEPA DOCUMENT ENVIRONMENTAL FACTOR	1994 EA	2000 EA	2011 EA	2017 EA/SOF
TURBIDITY AND WATER QUALITY	Short-term localized increase in turbidity at dredge and disposal sites.	Temporary effects to the water column. No significant detrimental impact.	No effects expected at Peck's Lake.	The project is expected to cause temporary and insignificant increases in turbidity at the borrow area and intertidal swash zone seaward of the beach. Due to the relatively low silt content and high density of the material, sand is expected to quickly fall out of the water column and only a short-term increase in turbidity is expected.
FISH & WILDLIFE RESOURCES	No effect.	Not evaluated	Minor impact during beach placement. Nesting, foraging, and resting shorebirds could be temporarily impacted during construction.	Not evaluated
RECREATION AND TOURISM	Short-term impact to recreational boat traffic and beach activities in project vicinity. Long-term benefits by maintaining recreational opportunities. Failure to maintain Inlet would have negative impacts on recreational use of Inlet.	Not evaluated	Short-term disruption of recreation within the Peck's Lake area.	Short-term effect to recreational boat traffic and beach activities in dredging and placement areas vicinity. Long-term benefits by maintaining recreational opportunities. Failure to maintain Inlet would have negative effects on recreational use of inlet.
NAVIGATION AND PUBLIC SAFETY	Short-term impact from presence and operation of dredging equipment. Long term moderate impact from maintaining navigable capacity of the channel.	Not evaluated	Short term impacts to IWW boat traffic when barges are in transport.	Beneficial effect of maintaining navigation through the inlet. Short term, minor impacts associated with construction equipment operating in the area.
NOISE	Some temporary construction noise will result.	Not evaluated	Minor and temporary adverse effects associated with construction activities.	Not evaluated
HAZARDOUS, TOXIC & RADIOACTIVE WASTE	Not evaluated	Not evaluated	Not evaluated	Not evaluated

NEPA DOCUMENT ENVIRONMENTAL FACTOR	1994 EA	2000 EA	2011 EA	2017 EA/SOF
ENERGY & CONSERVATION	Not evaluated	Not evaluated	Not evaluated	Not evaluated
AESTHETICS	Heavy equipment would be used during beach placement and would be “unsightly”	Minor and temporary adverse effects associated with construction activities.	Minor and temporary adverse effects associated with construction activities.	Project related turbidity will reduce nearshore aesthetics during construction efforts. Construction equipment will temporarily effect the aesthetics. Effects will be short term in nature.
SOCIOECONOMICS	Not evaluated	Not evaluated	Not evaluated	Minor beneficial effects associated with increased navigation through the inlet, as well as potential employment opportunities associated with the project.
CUMULATIVE IMPACTS	Temporary degradation in water quality at dredging site and some loss of organisms at dredge site. Repopulation of organisms anticipated.	Over the long term, stabilization of the Inlet will reduce the cumulative effects of frequent maintenance dredging operations and result in a more stable ecosystem in the area.	There are no known local, state or Federal projects within the Peck’s Lake project area currently planned, therefore there are no significant cumulative impacts expected. Future use of this area as a staging area for transfer of dredged material could have continued impacts to recreation, although projects would likely be scheduled to occur outside of the popular summer season.	No significant cumulative impacts expected.



## **2 ALTERNATIVES**

The alternatives section is perhaps the most important component of this Supplemental EA. It describes the No Action Alternative, the proposed action, and other reasonable alternatives that were evaluated. The beneficial and adverse environmental effects of the alternatives are presented in comparative form, providing a clear basis for choice to the decision maker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Environmental Effects.

### **2.1 DESCRIPTION OF ALTERNATIVES**

#### **2.1.1 ISSUES AND BASIS FOR CHOICE**

The issues and basis for choice associated with this EA was specifically the addition of a new placement area for O&M material dredged from the St. Lucie Inlet Federal navigation project. All other issues regarding beach placement and actual O&M of in the inlet have been previously addressed in the 2000 and 2011 EAs and are incorporated by reference.

#### **2.1.2 ALTERNATIVES ELIMINATED FROM DETAILED EVALUATION**

No alternatives were eliminated from detailed evaluation as only the No Action Alternative and Preferred Alternative

#### **2.1.3 NO ACTION ALTERNATIVE**

The No Action Alternative is the continued maintenance dredging of the St. Lucie Inlet Federal navigation channel and impoundment basin with placement in the existing nearshore and beach template placement areas. These alternatives were previously evaluated in the 1994, 2000 and 2011 EAs (refer to Section 1.6) and will not be discussed in this document, unless a new evaluation is required due to a change in legal status, (e.g. listing of a new species, or designation of critical habitat). The No Action Alternative includes the use of staging areas for storage of beach construction equipment, etc. required to placement the material on the beach. These are typically uplands (i.e. parking lots, recreation fields, etc.) and are selected in coordination with the contractor and local sponsor. If an upland area cannot be selected and impacts to resources would occur in association with the utilization of a staging area, the impacts would be coordinated with the appropriate resource agencies.

#### **2.1.4 DREDGING AND PLACEMENT INTO BORROW AREA "B"**

Periodic maintenance dredging of the Federal navigation channels would occur as planned (refer to Section 1.1 for more detail). Borrow Area "B" is a 562 acre offshore disposal area located south of the inlet, offshore of Jupiter Island located approximately between R-109 and R-118. Use of Borrow Area B would allow for storage of dredged material that may be utilized by others for future nourishment/re-nourishment events, meeting USACE's continued commitment to regional sediment management.

#### **2.1.5 PREFERRED ALTERNATIVE**

The preferred alternative (proposed action) is to continue periodic maintenance dredging of the Federal navigation channels with placement of dredged material into Borrow Area "B", approved nearshore location and the authorized beach template. The location of placement, per

maintenance event, may be constrained by fiscal and/or environmental factors.

## **2.2 COMPARISON OF ALTERNATIVES**

Table 2 lists alternatives considered and summarizes the major features and consequences of the proposed action as well as the other alternatives. See Section 4 Environmental Effects for a more detailed discussion of impacts of alternatives.

Table 2 - Comparison of Alternatives

<b>Environmental Factor</b>	<b>Dredging and Borrow Area "B"</b>	<b>Dredging with Placement on Beach, in Nearshore or in Borrow Area B</b>	<b>No Action Alternative Dredging and Beach Placement</b>	<b>No Action Alternative Dredging and Nearshore Placement</b>
<b>Sediment Characteristics</b>	No effect to native sediment characteristics within the navigation channels. Minor change to sediment characteristics within the borrow area. Placement would occur in accordance with the State permit and approved Quality Assurance/Quality Control (QA/QC) plan.	No effect to native sediment characteristics within the navigation channels. Minor change to sediment characteristics within the borrow area. Placement would occur in accordance with the State permit and approved Quality Assurance/Quality Control (QA/QC) plan.	No effect to native sediment characteristics within the navigation channels. Placement would occur in accordance with the State permit and approved QA/QC plan.	No effect to native sediment characteristics within the navigation channels. Placement would occur in accordance with the State permit and approved QA/QC plan.
<b>Fish and Wildlife (migratory birds, hardbottom, seagrasses, benthic habitats)</b>	Minor and temporary effect to marine life due to the temporary increase of turbidity and equilibration of sediment placement. Use of Borrow Area B would allow for storage of dredged material that may be utilized by others for future nourishment/re-nourishment events, authorized under a separate permit.	Minor short-term impact during sea turtle and migratory bird nesting season. Minor and temporary effect to marine life due to the temporary increase of turbidity and equilibration of sediment placement. Substantial long term benefit by creating additional nesting areas for sea turtles and migratory birds. Beach placement template has been designed to avoid impacts to nearshore hardbottom communities. To further minimize potential adverse effects, sand will not be placed between R-81 and R-89 where the hardbottom is the closest to shore. Use of Borrow Area B would allow for storage of dredged material that may be utilized by others for future nourishment/re-nourishment events, authorized under a separate permit. Loss of infaunal benthic resources in the nearshore placement area. Rapid recolonization expected.	Minor short-term impact during sea turtle and migratory bird nesting season. Substantial long term benefit by creating additional nesting areas for sea turtles and migratory birds. Beach placement template has been designed to avoid impacts to nearshore hardbottom communities. To further minimize potential adverse effects, sand will not be placed between R-81 and R-89 where the hardbottom is the closest to shore.	Minor and temporary effect to marine life due to the temporary increase of turbidity and equilibration of sediment placement in the nearshore. Loss of infaunal benthic resources in the nearshore placement area. Rapid recolonization expected.

<p><b>Threatened and Endangered Species</b></p>	<p>Hopper dredging may affect sea turtles. All other dredging and drag bar use may affect, but is not likely to adversely affect sea turtles, manatees, whales and smalltooth sawfish. Placement at Borrow Area “B” may affect, but is not likely to adversely affect sea turtles, whales and smalltooth sawfish. All terms and conditions of USFWS and NMFS biological opinions shall be implemented. Placement within Borrow Area “B” would allow entities to renourish the beach environment maintaining their benefits to listed species. Not likely to adversely modify loggerhead sea turtle critical habitat (Unit LOGG-N-18).</p>	<p>Hopper dredging may affect sea turtles. All other dredging and drag bar use may affect, but is not likely to adversely affect sea turtles, manatees, whales and smalltooth sawfish. Placement at Borrow Area “B” may affect, but is not likely to adversely affect sea turtles, whales and smalltooth sawfish. All terms and conditions of USFWS and NMFS biological opinions shall be implemented. Placement within Borrow Area “B” would allow entities to renourish the beach environment maintaining their benefits to listed species. Placement of material on the beach may affect, but it not likely to adversely affect piping plover and rufa red knot. Placement on the approved beach placement areas maintains nesting habitat for listed sea turtles and shorebirds. Not likely to adversely modify loggerhead sea turtle critical habitat (Unit LOGG-N-18).</p>	<p>Hopper dredging may affect sea turtles. All other dredging and drag bar use may affect, but is not likely to adversely affect sea turtles, manatees, whales and smalltooth sawfish. Placement of material on the beach may affect, but it not likely to adversely affect piping plover and rufa red knot. Placement on the approved beach placement areas maintains nesting habitat for listed sea turtles and shorebirds. Not likely to adversely modify loggerhead sea turtle critical habitat (Unit LOGG-N-18).</p>	<p>Hopper dredging may affect sea turtles. All other dredging and drag bar use may affect, but is not likely to adversely affect sea turtles, manatees, whales and smalltooth sawfish. No effect to nesting sea turtles or shorebirds. Not likely to adversely modify loggerhead sea turtle critical habitat (Unit LOGG-N-18).</p>
<p><b>Wildlife Refuges, Sanctuaries, and Management Areas</b></p>	<p>No effect</p>	<p>Beach placement on SLISP and the HSNWR. Beneficial effects to wildlife in these protected areas and continuation of recreational benefits. Placement of material in the nearshore seaward of SLISP and the HSNWR.</p>	<p>Beach placement on SLISP and the HSNWR. Beneficial effects to wildlife in these protected areas and continuation of recreational benefits.</p>	<p>Placement of material in the nearshore seaward of SLISP and the HSNWR. Beneficial effects to wildlife in these protected areas and continuation of recreational benefits.</p>
<p><b>Essential Fish Habitat (EFH)</b></p>	<p>Temporary and minor effects would occur to water column and unconsolidated sediment habitats. Habitats utilized by various life stages of penaeid shrimp complex, reef fish, stone crab, spiny lobster, migratory/pelagic fish, and snapper/grouper complex.</p>	<p>Temporary and minor effects would occur to water column and unconsolidated sediment habitats. Habitats utilized by various life stages of penaeid shrimp complex, reef fish, stone crab, spiny lobster, migratory/pelagic fish, and snapper/grouper complex.</p>	<p>Temporary and minor impacts would occur to water column and unconsolidated sediment habitats. Habitats utilized by various life stages of penaeid shrimp complex, reef fish, stone crab, spiny lobster, migratory/pelagic fish, and snapper/grouper complex.</p>	<p>Temporary and minor effects would occur to water column and unconsolidated sediment habitats. Habitats utilized by various life stages of penaeid shrimp complex, reef fish, stone crab, spiny lobster, migratory/pelagic fish, and snapper/grouper complex.</p>
<p><b>Air Quality</b></p>	<p>Minor, temporary reduction of air quality due to emissions from dredging and disposal operations.</p>	<p>Minor, temporary reduction of air quality due to emissions from dredging and disposal operations.</p>	<p>Minor, temporary reduction of air quality due to emissions from dredging and disposal operations.</p>	<p>Minor, temporary reduction of air quality due to emissions from dredging and disposal operations.</p>

<b>Water Quality</b>	There will be a temporary increase in turbidity levels at the dredge areas during work and at the offshore borrow site during the discharge of material. This elevated turbidity level will be temporary and is not expected to be significant, as state standards for turbidity will not be exceeded. No long-term adverse effects to water quality.	There will be a temporary increase in turbidity levels at the dredge areas during work and at the offshore borrow site during the discharge of material. This elevated turbidity level will be temporary and is not expected to be significant, as state standards for turbidity will not be exceeded. No long-term adverse effects to water quality.	There will be a temporary increase in turbidity levels at the dredge areas during work and in the surf zone on the beach during discharge of material. This elevated turbidity level will be temporary and is not expected to be significant, as state standards for turbidity will not be exceeded. No long-term adverse effects to water quality.	There will be a temporary increase in turbidity levels at the dredge areas during work and in the surf zone on the beach during discharge of material. This elevated turbidity level will be temporary and is not expected to be significant, as state standards for turbidity will not be exceeded. No long-term adverse effects to water quality.
<b>Hazardous, Toxic, Radioactive Waste</b>	No effect anticipated.	No effect anticipated.	No effect anticipated.	No effect anticipated.
<b>Noise</b>	A temporary increase in the noise level during construction in the vicinity of the project would occur.	A temporary increase in the noise level during construction in the vicinity of the project would occur.	A temporary increase in the noise level during construction in the vicinity of the project would occur.	A temporary increase in the noise level during construction in the vicinity of the project would occur.
<b>Aesthetic Resources</b>	During construction, equipment used for dredging would be visible, resulting in a temporary reduction in the aesthetic value in the construction area. Placement in Borrow Area B allows for continued aesthetic benefits associated with the beaches where sand placement would occur.	During construction, equipment used for dredging would be visible, resulting in a temporary reduction in the aesthetic value in the construction area. Placement in Borrow Area B, in the nearshore and placement directly on the beach allows for continued aesthetic benefits associated with the beaches that would benefit from the dredged material.	Temporary construction noise may result. Heavy equipment will be used during beach disposal and may be considered "unsightly." Placement on the beach allows for continued aesthetic benefits associated with the beaches where sand placement would occur.	Temporary construction noise may result. Heavy equipment will be used during beach disposal and may be considered "unsightly." Placement in the nearshore allows for continued aesthetic benefits associated with the beaches where sand placement would occur.
<b>Recreation Resources</b>	Dredging and placement operations may cause minor, temporary restrictions in recreation during operations.	Dredging and placement operations may cause minor, temporary restrictions in recreation during operations. Boat traffic and beach use will be temporarily interrupted due to dredging and placement activities. Supplemental beach sand will be added to the sand budget in the littoral drift zone.	Boat traffic and beach use will be temporarily interrupted due to dredging and placement activities. Supplemental beach sand will be added to the sand budget in the littoral drift zone.	Boat traffic will be temporarily interrupted due to dredging and placement activities. Supplemental beach sand will be added to the sand budget in the littoral drift zone.
<b>Socioeconomics</b>	Social and economic benefits that are based on navigation associated with the Federal project would continue. The extent of dredging may be limited by the appropriation of funds, approvals by Federal and state agencies and appropriate access to dredging and placement areas.	Social and economic benefits that are based on navigation associated with the Federal project would continue. The extent of dredging may be limited by the appropriation of funds, approvals by Federal and state agencies and appropriate access to dredging and placement areas.	Social and economic benefits that are based on navigation associated with the Federal project would continue. The extent of dredging may be limited by the appropriation of funds, approvals by Federal and state agencies and appropriate access to dredging and placement areas.	Social and economic benefits that are based on navigation associated with the Federal project would continue. The extent of dredging may be limited by the appropriation of funds, approvals by Federal and state agencies and appropriate access to dredging and placement areas.
<b>Navigation and Public Safety</b>	Dredging operations during construction may impede or restrict commercial or recreational access or ingress/egress to the area.	Dredging operations during construction may impede or restrict commercial or recreational access or ingress/egress to the area.	Dredging operations during construction may impede or restrict commercial or recreational access or ingress/egress to the area.	Dredging operations during construction may impede or restrict commercial or recreational access or ingress/egress to the area.
<b>Cultural Resources</b>	No adverse effect. Due to avoidance areas included in the project plans and specifications.	No adverse effect. Due to avoidance areas included in the project plans and specifications.	No adverse effect.	No adverse effect.

<b>Energy Requirements and Conservation</b>	Fuel would be required to operate dredges, pumps, and land moving equipment.	Fuel would be required to operate dredges, pumps, and land moving equipment.	Fuel would be required to operate dredges, pumps, and land moving equipment.	Fuel would be required to operate dredges, pumps, and land moving equipment.
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### 3 AFFECTED ENVIRONMENT

The Affected Environment section describes the existing environmental resources of the areas that would be affected if either alternative were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented. This section, in conjunction with the description of the “No Action Alternative,” forms the baseline conditions for determining the environmental effects of the reasonable alternatives.

#### 3.1 SEDIMENT QUALITY

St. Lucie Inlet material is fine to coarse calcareous and quartz sand having a grain size range from 0.07 to 10mm. The amount of fine material for the inlet is less than five percent.

#### 3.2 BIOLOGICAL COMMUNITIES

##### 3.2.1 BORROW AREA B COMMUNITIES

Sedimentary habitats such as those found in Borrow Area B support a variety of invertebrates and demersal fishes. Invertebrates using these types of habitats include infaunal and epifaunal species represented primarily by annelid worms, gastropods, bivalves, crustaceans, and echinoderms. Demersal feeding fishes prey on most of these species.

Infaunal organisms present in the soft bottoms offshore central east Florida are predominantly common invertebrates including crustaceans, echinoderms, mollusks, polychaetous annelids, and interstitial bryozoans. Infaunal populations exhibit both seasonal and spatial variability in distribution and abundance, due to temperature, sediment topography, bathymetry, and sediment composition, including particle size and organic content (Hammer et al. 2005).

Epifaunal invertebrates commonly occurring on the soft bottoms offshore central east Florida include lady crabs (*Ovalipes* spp.), calico scallop (*Argopecten gibbus*), calico box crab (*Hepatus epheliticus*), iridescent swimming crab (*Portunus gibbesii*), brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), striped sea star (*Luidia clathrata*), and arrowhead sand dollar (*Encope michelini*). The distribution on the epifaunal invertebrates listed above exhibit distributions that are depth-, temperature-, and sediment type-related (Hammer et al. 2005).

During a 2009 dive survey conducted in Martin County, various invertebrate and vertebrate organisms were observed. Results indicate the sand based benthic communities offshore of Martin County were composed of taxa typical of soft bottom habitats such as bivalves, gastropods, echinoderms, and crustaceans (Hesperides Group, LLC 2009). Several species of invertebrates found strictly in soft bottom habitats were very common, including razor clams (*Ensis directus*), arrowhead sand dollar, and a portunid crab. Other notable fauna included various small bivalves and gastropods, beaded sea stars (*Astropecten articulatus*), sea hare (*Aplysia* sp.), brittle stars (*Ophiarachna* sp.), and box crabs (*Calappa flamma*). Numerous sand dollars were observed on several of the dives along with egg cases of *Neverita duplicate*, a moon snail in the family *Naticidae*. These taxa are generally characterized by locally dense populations, high fecundity, and short life

spans.

### **3.3 FISH AND WILDLIFE**

#### **3.3.1 MIGRATORY BIRDS**

A number of seabirds and shorebirds may occur along the beach and offshore the project area, including a number of species considered birds of conservation concern by the Migratory Bird Treaty Act of 1918 (MBTA). These species all use sandy beaches for foraging and/or nesting and, therefore, could occur along the project area both onshore and offshore.

#### **3.3.2 MARINE MAMMALS**

The Marine Mammal Protection Act of 1972 protects all marine mammals from harvesting within the borders of the United States, regardless of status. Therefore, all marine mammals encountered in the offshore region of Martin County must be given due consideration. This section considers marine mammals not listed under the Endangered Species Act (ESA) of 1973, as amended.

The inner shelf plain and estuaries surrounding the project area support seasonal and permanent populations of marine mammals. Bottlenose dolphins are year-round residents, while the humpback whale may pass through the area during migration. Key biological aspects of selected marine mammal species that may occur in the general action areas are included in Table 3. Specific information on the life history of each of these species is available in NMFS' "Annual Reports to Congress under the MMPA" located at <http://www.nmfs.noaa.gov/pr/sars/region.htm>.



Table 3 - Marine Mammals not listed under the ESA, found Offshore of Martin County, FL

Common Name	Scientific Name	Frequency off Florida
<b>WHALES</b>		
Bryde's whale	<i>Balaenoptera brydei</i>	Rare
Humpback Whale (West Indies Distinct Population Segment)	<i>Megaptera novaeangliae</i>	Rare
Minke whale	<i>Balaenoptera acutorostrata</i>	Regular
Pygmy sperm whale	<i>Kogia breviceps</i>	Regular
Dwarf sperm whale	<i>Kogia sima</i>	Regular
Gervais' beaked whale	<i>Mesoplodon europaeus</i>	Regular
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	Regular
Blainville's beaked whale	<i>Mesoplodon densirostrus</i>	Regular
Sowerby's beaked whale	<i>Mesoplodon bidens</i>	Rare
True's beaked whale	<i>Mesoplodon mirus</i>	Extralimital
<b>DOLPHINS</b>		
Bottlenose dolphin	<i>Tursiops truncates</i>	Regular
Atlantic spotted dolphin	<i>Stenella frontalis</i>	Regular
Pantropical spotted dolphin	<i>Stenella attenuate</i>	Regular
Spinner dolphin	<i>Stenella longirostris</i>	Regular
Striped dolphin	<i>Stenella coeruleoalba</i>	Regular
Risso's dolphin	<i>Grampus griseus</i>	Regular
Pygmy killer whale	<i>Feresa attenuate</i>	Regular
False killer whale	<i>Pseudorca crassidens</i>	Regular
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>	Regular
Orca	<i>Orcinus orca</i>	Regular
Rough-toothed dolphin	<i>Steno bredanensis</i>	Regular
Clymene dolphin	<i>Stenella clymene</i>	Regular
Common dolphin	<i>Delphinus delphis</i>	Rare
Fraser's dolphin	<i>Lagenodelphis hosei</i>	Regular
Melon-headed whale	<i>Peponocephala electra</i>	Regular

### 3.3.3 BENTHOS

Sedimentary habitats such as sand shoals support a variety of invertebrates and demersal fishes. Invertebrates using shoals include infaunal and epifaunal species represented primarily by annelid worms, gastropods, bivalves, crustaceans, and echinoderms. Demersal feeding fishes prey on most of these species.

Infaunal organisms present in the soft bottoms offshore central east Florida are predominantly common invertebrates including crustaceans, echinoderms, mollusks, polychaetous annelids, and interstitial bryozoans. Infaunal populations exhibit both seasonal and spatial variability in distribution and abundance, due to temperature, sediment topography, bathymetry, and sediment composition, including particle size and organic content (Hammer et al. 2005).

Epifaunal invertebrates commonly occurring on the soft bottoms offshore central east Florida include lady crabs (*Ovalipes* spp.), calico scallop (*Argopecten gibbus*), calico box crab (*Hepatus epheliticus*), iridescent swimming crab (*Portunus gibbesii*), brown shrimp (*Farfantepenaeus aztecus*), white shrimp (*Litopenaeus setiferus*), striped sea star (*Luidia clathrata*), and arrowhead sand dollar (*Encope michelini*). The distribution on the epifaunal invertebrates listed above exhibit distributions that are depth-, temperature-, and sediment type-related (Hammer et al. 2005).

During a 2009 dive survey for the Martin County EIS, various invertebrate and vertebrate organisms were observed. Results indicate the benthic community of the Martin County sand source was composed of taxa typical of soft bottom habitats such as bivalves, gastropods, echinoderms, and crustaceans (Hesperides Group, LLC 2009). Several species of invertebrates found strictly in soft bottom habitats were very common, including razor clams (*Ensis directus*), arrowhead sand dollar, and a portunid crab. Other notable fauna included various small bivalves and gastropods, beaded sea stars (*Astropecten articulatus*), sea hare (*Aplysia* sp.), brittle stars (*Ophiarachna* sp.), and box crabs (*Calappa flammea*). Numerous sand dollars were observed on several of the dives along with egg cases of *Neverita duplicate*, a moon snail in the family *Naticidae*. These taxa are generally characterized by locally dense populations, high fecundity, and short life spans.

Distribution of interstitial bryozoans has recently been studied at shoals located offshore St. Lucie County, including the St. Lucie Shoal. A study conducted for USACE by Brostoff (2002) identified an average of 19 different species located within the samples from the St. Lucie Shoal, with the exceedingly dominant species collected being *Cupuladria doma*. Previous studies of Capron Shoal (north of St. Lucie Shoal) by Winston and Håkansson (1986) described the interstitial bryozoan population as adapting to interstitial conditions, characterized by small size, simplified, colony structure, and very early reproduction. The distribution of encrusting bryozoans extends along sandy continental shelves, providing a food source for crustaceans, echinoderms, and mollusks (Winston and Håkansson 1986).

#### 3.3.4 FISHERY RESOURCES

A number of sand shoal studies conducted along the eastern coast of the U.S. have documented the use of sand shoals as fish habitat (Able and Hagan 1995, Slacum et al. 2006, Walsh et al. 2006, Gilmore 2009). CSA International (2009) generally characterized use of sand shoals by fishes at several spatial scales. At broad scales (1 to 100 square kilometers), fishes may use shoal features as guideposts during migrations, local movements, or spawning. At intermediate scales (tens to hundreds of square meters), different parts of individual shoals may represent different foraging areas or shelter from predators or waves and currents. At smaller scales (e.g., meters to centimeters), sediment texture (fine sand to shell fragments), variable bedform structures, and biogenic structures may provide important predator refuge or foraging areas. Considering this spatial framework, most fundamental ecological functions of shoals for fishes fall into the categories of spawning, shelter, or foraging.

Gilmore (2009) synthesized unpublished information and data and interviewed local anglers to determine the importance of the east Florida sand shoals, including the St. Lucie Shoal, to fishes. The report inferred from the various data sources that more than 200 species potentially use shoals

for orientation, refuge, spawning, and feeding sites. Interviews with anglers confirmed that shoals served as aggregating points for small pelagic fishes such as Atlantic menhaden (*Brevoortia* spp.), Spanish sardine (*Sardinella aurita*), Atlantic thread herring (*Opisthonema oglinum*), and false pilchard (*Harengula clupeiola*). These species are important prey for numerous managed species, particularly from the coastal pelagic and highly migratory groups.

Additionally, the Bureau of Ocean Energy Management (BOEM) has recently completed a study of the usage of shoal habitats by fishes (Rutecki et al. 2014) and is currently conducting studies at Canaveral shoals to continue to refine the available information concerning shoal usage by fishes.

### 3.3.5 THREATENED AND ENDANGERED SPECIES

The lists of endangered and threatened species developed for this Supplemental EA (Table 4) were compiled from the South Atlantic Regional Biological Opinion (SARBO), the Statewide Programmatic Biological Opinion (SPBO) for Shore Protection Activities along the Coast of Florida and the Programmatic Piping Plover Biological Opinion (P3BO) for Shore Protection Activities in the Geographical Region of the North and South Florida Ecological Services Field Offices, as well as project specific biological assessments and biological opinions prepared for previous projects which have taken place in the vicinity of the proposed project.

Table 4 - Threatened and Endangered Species in the Project Area

Common Name	Scientific Name	Listing Status
Blue whale	<i>Balaenoptera musculus</i>	Endangered
Finback whale	<i>Balaenoptera physalus</i>	Endangered
Sei whale	<i>Balaenoptera borealis</i>	Endangered
Sperm whale	<i>Physeter macrocephalus</i>	Endangered
North Atlantic right whale	<i>Eubalaena glacialis</i>	Endangered
Green sea turtle (North Atlantic DPS)	<i>Chelonia mydas</i>	Threatened
Hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered
Leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered
Loggerhead sea turtle (Northwest Atlantic DPS)	<i>Caretta</i>	Threatened/Critical Habitat
Smalltooth sawfish	<i>Pristis pectinata</i>	Endangered

### 3.3.6 SEA TURTLES

Martin County is within the normal nesting range of three species of sea turtles; the loggerhead (*Caretta caretta*), the North Atlantic distinct population segment (DPS) of green sea turtle (*Chelonia mydas*) (80 FR 15272), and the leatherback (*Dermochelys coriacea*). The leatherback sea turtle is listed as endangered under the (ESA). The loggerhead sea turtle is listed as threatened and the North Atlantic DPS of the green sea turtle is currently proposed as a threatened species; previously all green sea turtles found in the U.S. were listed as endangered species.

Additionally, the waters offshore of Martin County are also used for foraging and shelter for the

three species listed above as well as the hawksbill (*Eretmochelys imbricata*) and Kemp's ridley sea turtles (*Lepidochelys kempii*).

NMFS has designated three units of critical habitat for the loggerhead sea turtle in the waters offshore of Martin County. Figure 4 shows each of the units. Unit 01 is Sargassum Habitat and is denoted by the pink area, Unit 18 is Constricted Migratory Habitat denoted by the blue area and Unit 19 is Nearshore Breeding Habitat denoted by the orange area. The red and purple areas in the graphic are other critical habitat units located south of the project area and are not being affected by the proposed project. The constituent elements of each designated unit can be found in the final rule issued by NMFS designating the habitat (NMFS 2014a).

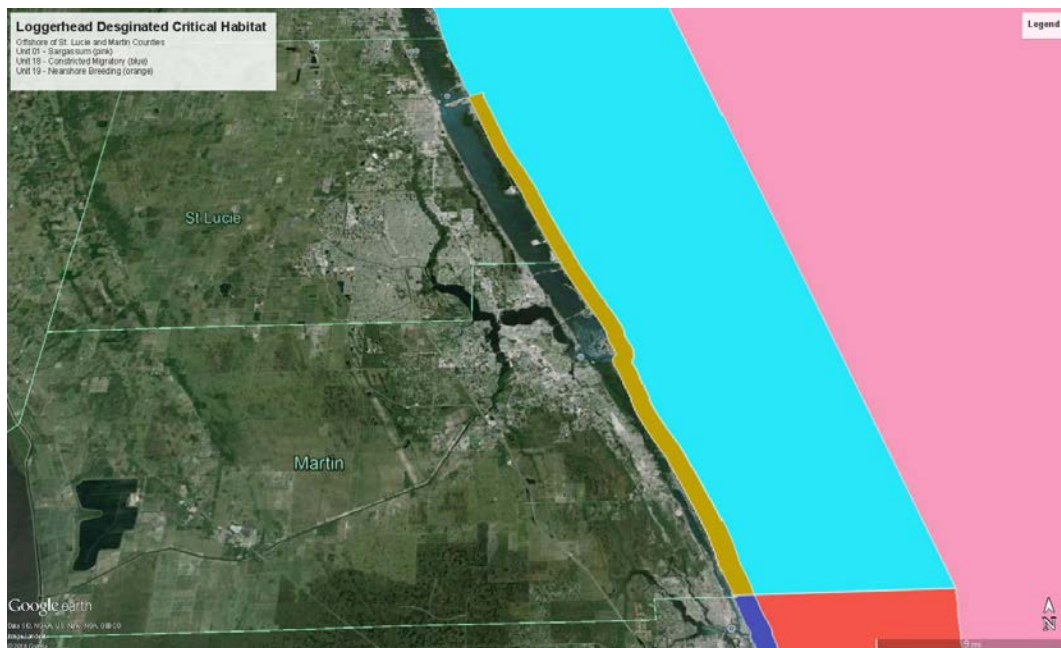


Figure 4 - Designated Critical Habitat for Loggerhead Sea Turtles Offshore of Martin County, Florida

### 3.3.7 MARINE MAMMALS

Four baleen whales (North Atlantic right, blue, fin, and sei), one toothed whale (sperm whale), and one sirenian (West Indian manatee) occur in the Atlantic Ocean offshore of St. Lucie Inlet and are listed as endangered under the ESA. With the exception of the North Atlantic right whale, all of the whales are typically found offshore, in deeper waters and are not expected to be encountered closer to shore near Borrow Area B.

The North Atlantic right whale (*Eubalaena glacialis*) is a federally listed endangered species and is also listed as a depleted stock under the MMPA. The estimated population within the north Atlantic Region is between 400 and 500 animals (NMFS2014). North Atlantic right whales are highly migratory, summering in feeding and nursery grounds in New England waters and northward to the Bay of Fundy and the Scotian Shelf (NMFS 2014). They migrate southward in winter to the northeastern coast of Florida. During these winter months, right whales are routinely seen close to shore. While North Atlantic right whales have been historically reported in south Florida and

the Gulf of Mexico, these sightings are extremely rare (Dan O'Dell, Hubbs-Sea World Research Institute, 2002, personal communication; North American Right Whale Consortium database, University of Rhode Island, accessed September 2003).

The Florida manatee is a subspecies of the West Indian manatee (*Trichechus manatus*) and can be found throughout the southeastern United States, including the project area. Manatees can be found in the inshore waters of the project channels and in the coastal waters of the Atlantic Ocean primarily during migration. The proposed work does not overlap any designated critical habitat for this species. Between 1974 and 2016 there have been 273 documented manatee mortalities in Martin County. The probable cause of death for 72 (26%) of these mortalities was collisions with watercraft (<http://myfwc.com/research/manatee/rescue-mortality-response/mortality-statistics/yearly/>).

### 3.3.8 SMALLTOOTH SAWFISH

The smalltooth sawfish (*Pristis pectinata*) is currently listed as endangered by NMFS and rarely occurs near any of the in-water sand source locations. This species has become rare along the southeastern Atlantic and northern Gulf of Mexico coasts of the U.S. during the past 30 years, and its known primary range is now reduced to the coastal waters of Everglades National Park in extreme southern Florida. Fishing and habitat degradation have extirpated the smalltooth sawfish from much of this former range.

The smalltooth sawfish is distributed in tropical and subtropical waters worldwide. It normally inhabits shallow waters (33 feet/ 10 meters or less), often near river mouths or in estuarine lagoons over sandy or muddy substrates, but may also occur in deeper waters (66 feet/20 meters) of the continental shelf. Shallow water less than 3.3 feet (1 meter) deep is an important nursery area for young smalltooth sawfish and maintenance and protection of these habitat is an important component of the "Recovery Plan for Smalltooth Sawfish (*Pristis pectinata*)" (NMFS 2009). Recent studies indicate that key habitat features (particularly for immature individuals) nominally consist of shallow water, proximity to mangroves, and estuarine conditions. Smalltooth sawfish grow slowly and mature at about 10 years of age. Females bear live young, and the litters reportedly range from 15 to 20 embryos requiring a year of gestation. Their diet consists of macroinvertebrates and fishes such as herrings and mullets. The saw is reportedly used to rake surficial sediments in search of crustaceans and benthic fishes or to slash through schools of herrings and mullets (NMFS 2009).

Although NMFS designated critical habitat for the species in 2009, there is no designated critical habitat in any of the project areas (either dredging or placement areas).

As part of the Identification of *Alternative Sand Sources for the Remaining Period of Federal Participation, Dade County Beach Erosion Control and Hurricane Protection Project, Miami-Dade County, Florida, March 2016* EA that included a review of sand sources in Federal waters off of Martin County, a request for sighting info smalltooth sawfish was made in December 2014. For Martin County, there are more sightings in the offshore areas: including sightings more than eight miles from shore (Figure 5).

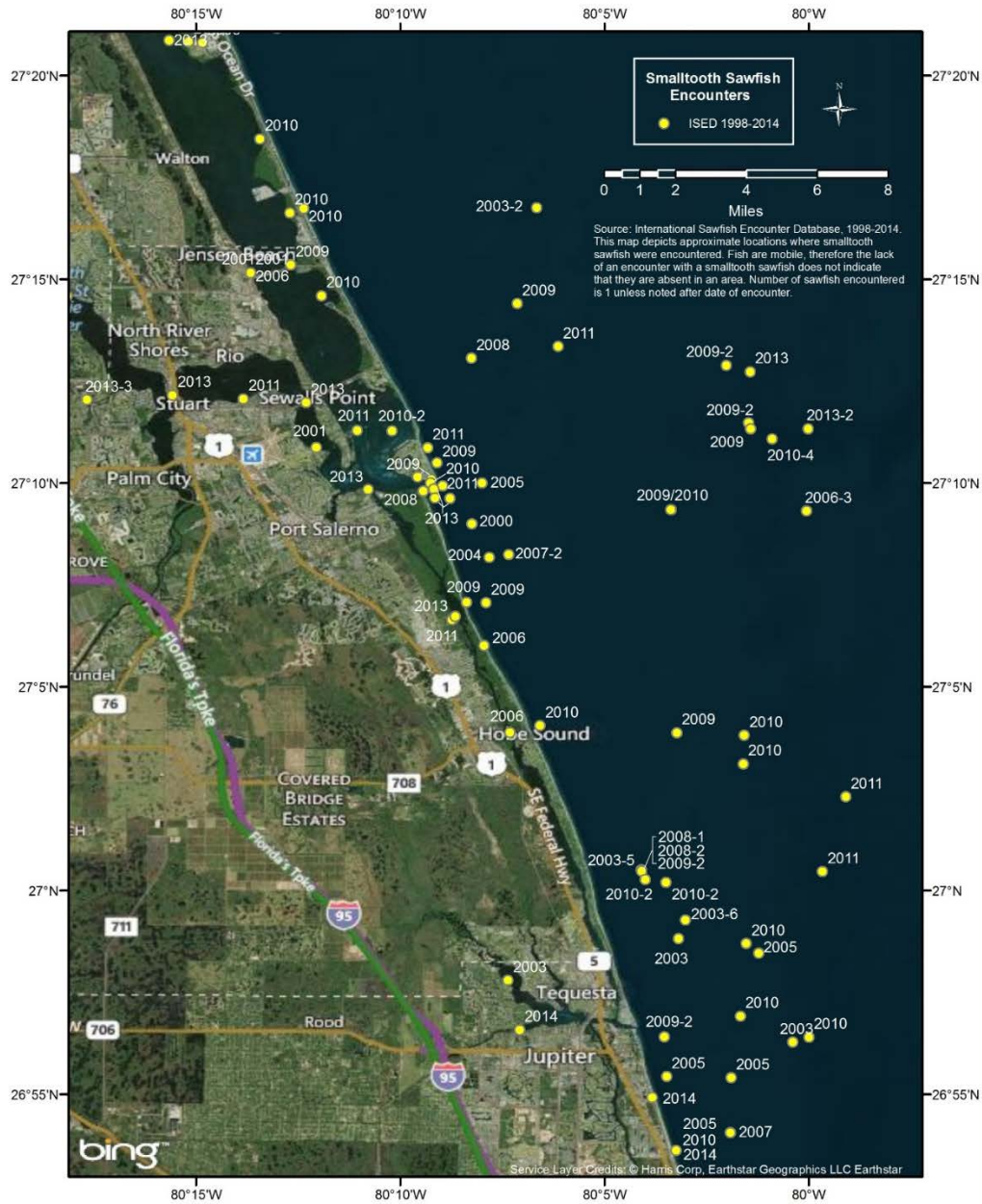


Figure 5 - Smalltooth Sawfish Sightings - Martin County and Offshore Waters

### 3.3.9 PIPING PLOVER

Piping plovers breed during the late spring and summer in three discrete areas of North America: The Northern Great Plains, the Great Lakes, and the Atlantic Coast. They winter in coastal areas of the United States from North Carolina to Texas. The piping plover has a patchy distribution along the coasts of Florida that is correlated with the availability of suitable, open habitat. The numbers and distribution of plovers are vulnerable to declines with loss and degradation of habitat. The habitats include beaches, mud flats, sand flats, algal flats, and washover passes (Doonan et al. 2005). Behavioral observations of piping plovers on the wintering grounds suggest that they spend the majority of their time foraging (Nicholls and Baldassarre 1990). Primary prey for wintering plovers includes polychaete marine worms, various

crustaceans, insects, and occasionally bivalve mollusks (Nicholls 1989).

The USFWS designated 142 areas along the Gulf and Atlantic coasts as critical habitat for the wintering population of the piping plover. The Federal Register, Vol. 66, No. 132, July 11, 2001 stated:

*Unit FL-33: St. Lucie Inlet. 114 ha (282 ac) in Martin County. The unit includes a small area south of the jetty on the north shore of St. Lucie Inlet, from the jetty west 0.42 km (0.26 mi). While the two sides of the inlet are privately owned, the great majority of the unit is on public land in the Saint Lucie Inlet State Preserve, administered by Jonathan Dickinson State Park. It begins on the sandy shoreline south of Saint Lucie Inlet and extends along the Atlantic Ocean shoreline 2.6 km (1.6 mi). It includes land from MLLW to where densely vegetated habitat (including grass or lawns) or developed structures, not used by the piping plover, begin and where the constituent elements no longer occur. The unit does not include sandbars within the inlet.*

As part of the Federal Register Notice, maps of each of the units were included. Figure 6 shows the area of Martin County included under Unit FL-33.

## General locations of the designated critical habitat for the Wintering Piping Plover.



Figure 6 - Unit FL-33 of Designated Critical Habitat for the Piping Plover

### 3.3.10 RUFA RED KNOT

The rufa subspecies of the red knot (*Calidris canutus rufa*), listed as threatened, is a small shorebird that can occur along the Atlantic and Gulf coasts during migration. It is also known to overwinter in low numbers along both coasts. Florida is home to the largest concentration of wintering rufa in the United States (A.C. Schwarzer et al. 2012). In migration and winter, it prefers coastal mudflats, tidal zones, and sometimes open sandy beaches where it feeds on small invertebrates such as small mollusks, marine worms, and crustaceans (Kaufman 1996). The knot population has declined primarily due to reduced food availability from increased harvests of horseshoe crabs (USFWS 2015). Their numbers appear to have stabilized in the past few years, but they remain at low levels relative to earlier decades (USFWS 2015). Critical Habitat has not been designated for



this species.

### 3.4 WILDLIFE REFUGES AND STATE PARKS

Significant wildlife protection/management areas located in the project vicinity (Figure 7) include the following: St. Lucie Inlet Preserve State Park and the Hobe Sound National Wildlife Refuge.

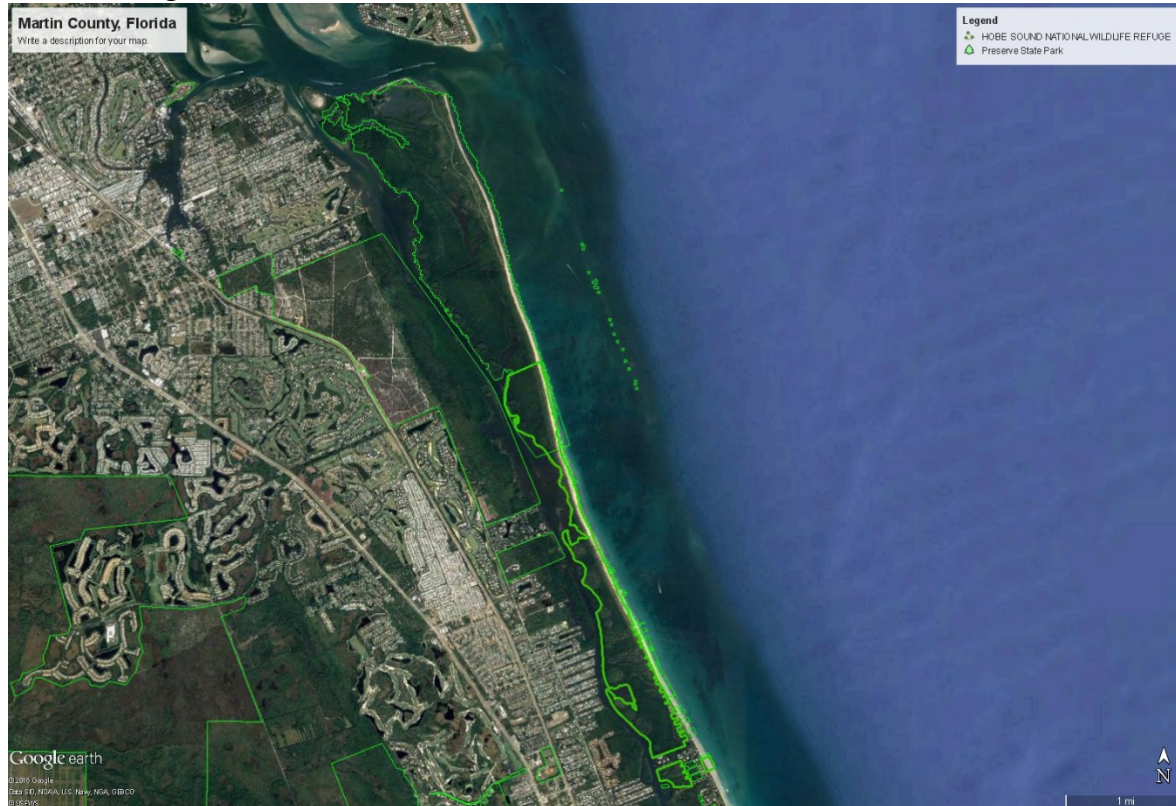


Figure 7 - Location of Wildlife Refuges and State Parks near the Project Area.

### 3.5 ESSENTIAL FISH HABITAT

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires Federal agencies to consult with NMFS on activities that may adversely affect Essential Fish Habitat (EFH). This EA is prepared consistent with guidance provided by the NMFS Southeast Regional Office to USACE, Jacksonville District regarding coordinating EFH consultation requirements with NEPA (NMFS 1999). EFH is defined as “those waters and substrate necessary to fish for spawning, breeding, or growth to maturity” (SAFMC 1998).

Types of EFH in oceanic waters offshore of Martin County where Borrow Area B is located:

- *Sargassum*;
- Sandy Shoals;
- Corals, Coral Reef, and Hard/Live Bottom
- Water Column.

#### 3.5.1 SARGASSUM

*Sargassum*, a genus of macroalgae that permanently drifts at the surface in warm waters of the Atlantic Ocean (SAFMC 2002), normally occurs in scattered individual clumps ranging from 10 to 50 centimeters (4 to 20 inches) in diameter. Accumulation of *Sargassum* and other flotsam in lines often indicates a convergence zone between water masses. Convergence zones are sites of considerable biological activity; many species (including juvenile sea turtles and pelagic fishes) will gather along these zones regardless of whether *Sargassum* or other flotsam is present (Carr 1986).

Floating *Sargassum* provides habitat for as many as 100 fish species at some point in their life cycle, but only two spend their entire lives there: the Sargassumfish and the Sargassum pipefish (Adams 1960, Dooley 1972, Bortone et al. 1977, SAFMC 2002). Most fishes associated with *Sargassum* are temporary residents (e.g., juveniles of jacks, triggerfishes, flying fishes, and filefishes). Adults of these species reside in shelf or coastal waters (McKenney et al. 1958, Dooley 1972, Bortone et al. 1977, Moser et al. 1998, Comyns et al. 2002). In addition, several larger species of recreational or commercial importance, including dolphin, yellowfin tuna, blackfin tuna, skipjack tuna, little tunny, and wahoo, feed on the small fishes and invertebrates attracted to *Sargassum* (Morgan et al. 1985).

The South Atlantic Fisheries Management Council (SAFMC) has designated *Sargassum* as EFH for species in the snapper-grouper complex and the dolphin-wahoo fishery. Species within the snapper-grouper complex use *Sargassum* for spawning (SAFMC 2002). *Sargassum* is considered a Habitat of Particular Concern (HAPC) for dolphin and wahoo (SAFMC 2003). In addition to SAFMC-managed species, billfish and swordfish utilize *Sargassum* for various life stages.

### 3.5.2 SANDY SHOALS

Coastal migratory pelagic fish use sandy shoals for all life stages, though spawning most frequently takes place inshore (Collette and Nauen 1983). It is likely that sailfish, though a member of the highly migratory species complex, also use the shoals for spawning. This species tends to frequent nearshore waters more often than other highly migratory species. Interviews conducted with local fishermen indicated that shoals concentrate planktivorous fish, herrings, sardines, and menhaden. The large schools of herrings, sardines, and menhaden attract pelagic carnivores such as barracuda, mackerel, little tunny, and various jacks and sharks to waters adjacent to the shoals (Gilmore 2008).

Gilmore (2008) stated the sand/shoal fish assemblage studies of Walsh et al. (2006) and Vasslides and Able (2008) were of direct value by providing insight into the value of shoals to both benthic and pelagic species and have relevance in Florida even though they were both based on work done on the continental shelf in other states. Vasslides and Able (2008) found that sand ridges (sand shoals) off New Jersey were “strategic ecological features” increasing the abundance of certain species and providing EFH for economically important species, commercial, and recreational fisheries.

Additionally, BOEM has recently completed a study of the usage of shoal habitats by fishes (Rutecki et al. 2014) and is currently conducting studies at Canaveral shoals to continue to refine the available information concerning shoal usage by fishes.

### 3.5.3 CORALS, CORAL REEF AND HARD/LIVE BOTTOMS

As stated in CSA (2004), EFH for reef building stony corals is outside of the study area and extends from Palm Beach County south through the Florida reef tract bordering the Florida Keys. While very scattered hard corals may be present in oceanic waters offshore of Martin County (Walker 2012), there are insufficient densities to grow into coral reefs. Hardbottom habitats located in southern Martin County are typically described as sponge and algae dominated. EFH for most octocorals includes hard, exposed, rough, stable substrate and are found within the waters offshore of the county.

A subset of EFH that raise additional concern are Habitat Areas of Particular Concern (HAPCs). For corals, coral reefs and hard/live bottom habitats off of central east Florida, the only type of HAPC found in the project area is offshore hardbottom habitats in water depths 5 to 30m. Hardbottom resources (including corals) are present approximately 1,000 feet west of Borrow Area B as described in a 2010 resource delineation (Figure 8). Pre and Post construction surveys of Borrow Area B will be conducted when it is used as a sand source for the Town of Jupiter Island’s shore protection project.

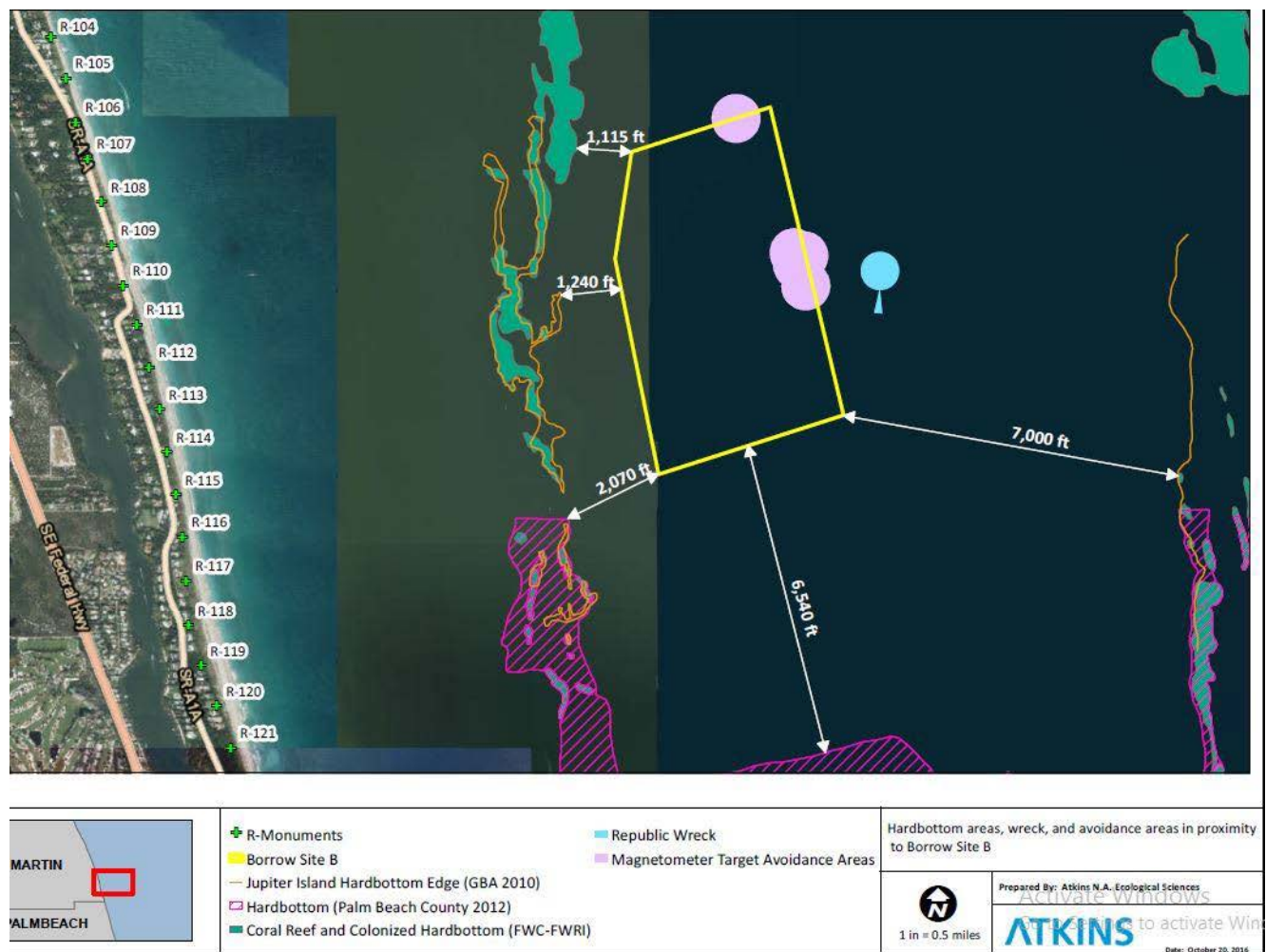


Figure 8 - Mapped Hardbottom Resources in the Vicinity of Borrow Area B.

#### 3.5.4 SAND SOURCES USED FOR SPAWING AND GROWTH TO MATURITY

Penaeid shrimp utilize offshore habitats for multiple life stages. Shelf waters encompassing the potential sand sources provide suitable water depth and substrate for spawning shrimp, which migrate offshore as adults. EFH for penaeid shrimp includes inshore estuarine nursery areas, offshore marine habitats for spawning and growth to maturity, and all interconnecting water bodies (SAFMC 1998a, 1998b). Offshore waters also serve as habitat for larval and post-larval shrimp. These shrimp are planktonic and feed on zooplankton in the water column.

#### 3.5.5 WATER COLUMN

The water column is considered EFH for the highly migratory species complex. Sailfish, in particular, are known to spawn nearer to shore than the other billfish in this category; therefore, they are included in this assessment.

#### 3.5.6 MANAGED SPECIES

Managed species in these habitats include coastal pelagic fishes, sailfish, dolphin, wahoo, bluefish and highly migratory species. A comprehensive list of the species for each management plan can be located in each management plans available at NMFS' Habitat Conservation website (<http://www.habitat.noaa.gov/protection/efh/newInv/index.html>).

### 3.6 AIR QUALITY

Ambient air quality along the southeast Florida coast is generally good due to prevalent ocean breezes from the northeast to the southeast. The area is in the southeast Florida Intrastate Air Quality Control Region, as established by 40 CFR § 81.49. USEPA (40 CFR § 81.310) designates air quality compliance on a county level and Martin County is considered as being in attainment with National Ambient Air Quality Standards for ozone, nitrogen dioxide, carbon monoxide; total suspended particulates, and sulfur dioxide. The U.S. Environmental Protection Agency (EPA) has not made a designation for lead in southeastern Florida.

### 3.7 WATER QUALITY

The State of Florida classifies surface waters from "I" (drinking water quality) to "V" (industrial water discharge quality). The predominant issue that affects water quality in offshore waters in south Florida is turbidity, which is considered a good measure of water quality. Turbidity is measured in Nephelometric Turbidity Units (NTU), which is a measure of light-scatter by particulates within the water. This measurement does not address the characteristics of the suspended material that creates turbid conditions. Florida state guidelines set to minimize turbidity effects from beach restoration activities confine turbidity values to under 29 NTU above ambient levels outside the turbidity mixing zone.

Turbidity values are generally lowest in the summer months and highest in the winter months, corresponding with winter storm events and the rainy season, and are higher closer to shore (Gilliam 2008; Dompe and Haynes, 1993; Coastal Planning & Engineering, 1989). Moreover, higher turbidity levels can generally be expected around inlet areas, and especially in estuarine areas, where nutrient and entrained sediment levels are higher. Although some colloidal material will remain suspended in the water column upon disturbance, high turbidity episodes usually return to background conditions within several days to several weeks, depending on the duration of the

perturbation (storm event or other) and on the amount of suspended fines.

The water quality around the St. Lucie Inlet and Atlantic Ocean has a State of Florida classification of II, which are waters that are acceptable for recreational bathing, fishing, and wildlife management.

### **3.8 NOISE**

Noise is defined as unwanted sound and, in the context of protecting public health and welfare, implies potential effects on the human and natural environment. Noise is a significant concern associated with construction, dredging, and transportation activities and projects. Ambient noise levels within a given region may fluctuate over time because of variations in intensity and abundance of noise sources.

The degree of disturbance or annoyance of unwanted sound depends on: (1) the amount and nature of intruding noise; (2) the relationship between the background noise and the intruding noise; and (3) the type of activity occurring at the location where the noise is heard. Human response to noise varies from individual to individual and is dependent on the ambient environment in which the noise is perceived. Wind, temperature, and other conditions can change the sound volume perceived at distances from the noise source. Ambient sources of noise within the project area are recreational activities (boating and fishing), commercial vessels transiting up and down the coast and natural sounds from the physical and biological environment. Because Martin County has many seasonal residents and tourists, many more residents are present in the winter months, which results in more boating traffic during the winter tourist season. These sources are expected to remain at their present noise levels.

### **3.9 AESTHETIC RESOURCES**

The area of Borrow Area B is open water. The aesthetic of an area are considered the visual resources in the area, in this case the open ocean and marine life in the vicinity.

### **3.10 RECREATIONAL RESOURCES**

Recreational activities offshore of Martin County near Borrow Area B are mainly confined to offshore fishing activities due to the distance of the sand source to shore. The area is easily accessible by boat from Martin County. The high diversity of fish species in this area supports sport and recreational fishing opportunities. With the Gulf Stream just offshore, there are a significant number of marinas which offer offshore fishing opportunities for residents and visitors.

### **3.11 COASTAL BARRIER RESOURCES**

There is one designated Coastal Barrier Resource System Unit to the south of the St Lucie Inlet, Unit P12, "Hobe Sound Unit" as well as area P12P, St. Lucie Inlet Preserve State Park, which is classified as an "Otherwise Protected Area" under the program (Figure 9).

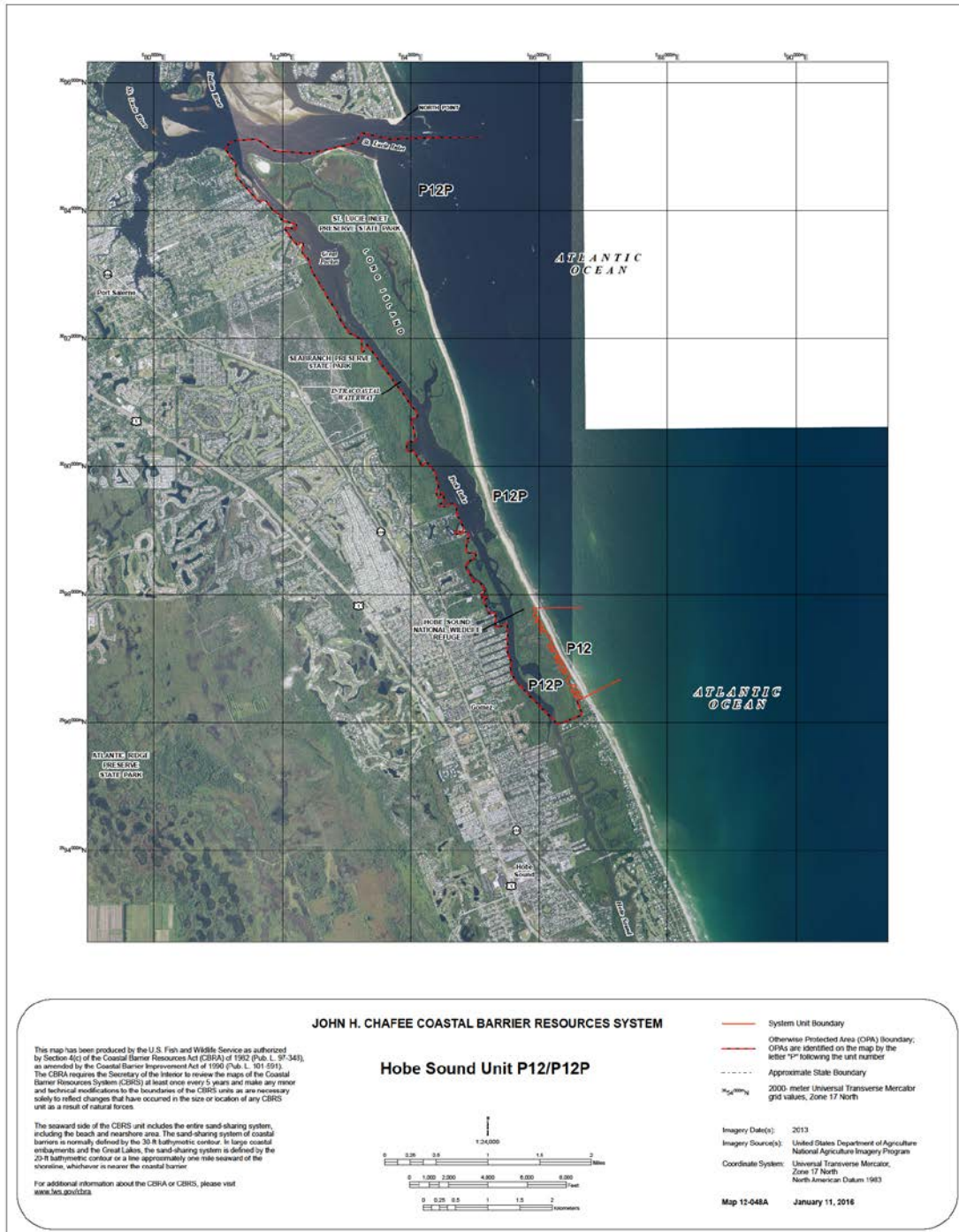


Figure 9 - Coastal Barrier Resources System - Unit P12 and P12P

### 3.12 NATIVE AMERICANS

Neither the St. Lucie Inlet Federal Navigation Channel or Borrow Area B are not located within or adjacent to known Native American-owned lands, reservation lands, or Traditional Cultural Properties.

### 3.13 CULTURAL RESOURCES

Previous consultations with the SHPO have occurred for the continued O&M dredging of the Inlet and for the placement of the sand within Borrow Area B. The O&M dredging of St Lucie Inlet was coordinated with the SHPO in 1994, and the SHPO did not respond to the public notice. A lack of response from the SHPO was deemed concurrence that the project was in compliance. In April 1999, the St. Lucie Inlet Navigation Improvements Project coordinated with the SHPO with the determination that the navigation improvements project would not affect significant historic properties. The SHPO concurred with that determination in August 1999. During the 2011 NEPA coordination for the addition of the Peck's Lake pumpout station, the SHPO reviewed the project and determined that there were no historic properties eligible for listing that would be adversely affected by the project. In a November 18, 2011 letter, the SHPO concurred with the determination that no historic properties eligible for listing in the National Register would be adversely affected by the project.

A project specific SHPO consultation was conducted and in a February 16, 2016 letter, the SHPO determined that the proposed project activities were unlikely to affect historic properties if the following specific conditions are followed. The specific conditions are based on the use of Borrow Area B by the Town of Jupiter Island as a sand source under Department of Army (DA) permit SAJ-1992-01740(MOD) dated November 13, 2015. The SHPO requested the following special condition be incorporated into the DA permit.

***Borrow Area B:** No sand borrowing or transfer work should be allowed to occur within a 500-foot radius of the anomalies, or their respective clusters recorded in the 1989 magnetometer survey of Borrow Area B (Florida Master Site File # 2115). The 500-foot radii should be delineated by marker buoys.*

The pink bubbles on the eastern side of Borrow Area B in Figure 8 show the areas to be avoided by the project. These areas will also be noted in the plans and specs for the St. Lucie O&M project to prevent placement of any materials in the exclusion areas noted in the permit.

## 4 ENVIRONMENTAL EFFECTS

This section is the analytic basis for the comparisons of the alternatives. See Table 1 in section 2.0 Alternatives, for summary of effects. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects. Previous EAs have assessed the effects of placing material dredged from the channel onto the beach within St. Lucie Preserve State Park and the Hobe Sound National Wildlife Refuge as identified in Section 1.1. All of these previous EAs, which are incorporated by reference (Section 1.4, Related Environmental Studies), had a corresponding FONSI.

### 4.1 SEDIMENT QUALITY

**No Action Alternative.** No adverse effects on native sediment characteristics would occur.

**Proposed Action, Dredging and Placement in Borrow Area B.** No adverse effects on existing sediment in Borrow Area B would occur.

### 4.2 BIOLOGICAL COMMUNITIES AND LAND USE

#### 4.2.1 BORROW AREA B COMMUNITIES

**No Action Alternative.** No effects to communities within Borrow Area B as no material associated with O&M of St. Lucie Inlet will be placed in the Borrow Area.

**Dredging and Placement in Borrow Area B.** Minor and temporary effect to marine life within the Borrow Area due to the temporary increase of turbidity and equilibration of sediment placement.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Minor and temporary effect to marine life within the Borrow Area due to the temporary increase of turbidity and equilibration of sediment placement.

#### 4.2.2 OPEN WATER HABITATS

**No Action Alternative.** Temporary effects associated with turbidity will on open water communities would occur during dredging and nearshore placement activities.

**Proposed Action, Dredging and Placement in Borrow Area B.** Minor and short term effects on open water communities would occur due to sedimentation and turbidity associated with material placement within Borrow Area B.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Minor and short term effects on open water communities would occur due to sedimentation and turbidity associated with dredging the inlet, and material placement on the beach, or within the approved nearshore template or Borrow Area B.

### 4.3 FISH AND WILDLIFE

#### 4.3.1 MIGRATORY BIRDS

**No Action Alternative.** Short-term impact during migratory bird nesting season, if placement of



dredged material takes place during nesting season. Timeframes will be dictated by the P3BO Terms and Conditions. There are long term benefit by creating additional nesting and foraging areas for migratory birds by the increase in dry beach.

**Dredging and Placement in Borrow Area B** No adverse effects on migratory birds will occur associated with placement of material in Borrow Area B.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Short-term impact during migratory bird nesting season, if placement of dredged material takes place during nesting season. Timeframes will be dictated by the P3BO Terms and Conditions. There are long term benefit by creating additional nesting and foraging areas for migratory birds by the increase in dry beach. No adverse effects on migratory birds will occur associated with placement of material in Borrow Area B.

#### 4.3.2 MARINE MAMMALS

**No Action Alternative.** Marine mammals that may be transiting through the area during transit from the St. Lucie Inlet to either the beach pumpout location or the nearshore placement area may avoid the area due to the dredges presence in the vicinity. However this would be a temporary effect of the project and would cease after the project is completed. No adverse effects on non-listed marine mammals would occur. In the April 25, 2005 notice in the Federal Register (70FR 21174) for the issuance of an IHA for Small Takes of Marine Mammals Incidental to Specified Activities; Port of Miami Construction Project (Phase II), NMFS stated: *According to the Corps, bottlenose dolphins and other marine mammals have not been documented as being directly affected by dredging activities and therefore the Corps does not anticipate any incidental harassment of bottlenose dolphins by dredging.*

**Dredging and Placement in Borrow Area B.** Marine mammals that may be transiting through the area during transit from the St. Lucie Inlet to Borrow Area B may avoid the area due to the dredges presence in the vicinity of Borrow Area B. However this would be a temporary effect of the project and would cease after the project is completed. No adverse effects on non-listed marine mammals would occur. In the April 25, 2005 notice in the Federal Register (70FR 21174) for the issuance of an IHA for Small Takes of Marine Mammals Incidental to Specified Activities; Port of Miami Construction Project (Phase II), NMFS stated: *According to the Corps, bottlenose dolphins and other marine mammals have not been documented as being directly affected by dredging activities and therefore the Corps does not anticipate any incidental harassment of bottlenose dolphins by dredging.*

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Marine mammals that may be transiting through the area during transit from the St. Lucie Inlet to the beach pumpout location, the nearshore placement area or Borrow Area B may avoid the area due to the dredges presence in the vicinity. However this would be a temporary effect of the project and would cease after the project is completed. No adverse effects on non-listed marine mammals would occur. In the April 25, 2005 notice in the Federal Register (70FR 21174) for the issuance of an IHA for Small Takes of Marine Mammals Incidental to Specified Activities; Port of Miami Construction Project (Phase II), NMFS stated: *According to*

*the Corps, bottlenose dolphins and other marine mammals have not been documented as being directly affected by dredging activities and therefore the Corps does not anticipate any incidental harassment of bottlenose dolphins by dredging.*

#### 4.3.3 BENTHOS

**No Action Alternative.** Benthos that inhabits the dredging area or nearshore placement area would be removed from the area by either the dredging activity, or burial with nearshore placement. This impact is likely to be temporary and would likely recover within one year to 18 months. No long-term adverse effects are anticipated to the intertidal macroinfaunal community due to nourishment activities (Deis et al. 1992, Nelson 1985, Gorzelany and Nelson 1987).

**Dredging and Placement in Borrow Area B.** Placement of material in Borrow Area B will have a direct impact to open sandy habitat within the borrow area which provides habitat to fish, crustaceans, mollusks and other aquatic organisms. Impacts are anticipated to be directly related to dredging and the discharge of dredged material into Borrow Area B and are anticipated to be temporary and would likely recover within one year to 18 months. The immediate impact of placing material into the borrow area will be the burial of portions of the benthic invertebrate populations that inhabit the borrow area, especially those fauna with sessile and slow-moving lifestyles. Since the entire footprint of Borrow Area B is not being used for material placement (Figure 3), the remaining area where material is not placed can serve as the primary source of colonizing fauna for the recovery of those species into the placement footprint (Van Dolah et al. 1984; Jutte et al. 2002).

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Benthos that inhabits the inlet channel dredging area or nearshore placement area would be removed from the area by either the dredging activity, or burial with nearshore placement. This impact is likely to be temporary and would likely recover within one year to 18 months. No long-term adverse effects are anticipated to the intertidal macroinfaunal community due to nourishment activities (Deis et al. 1992, Nelson 1985, Gorzelany and Nelson 1987).

Placement of material into Borrow Area B will have a direct impact to open sandy habitat within the borrow area which provides habitat to fish, crustaceans, mollusks and other aquatic organisms. Impacts are anticipated to be directly related to dredging and the discharge of dredged material into Borrow Area B and are anticipated to be temporary and would likely recover within one year to 18 months. The immediate impact of placing material into the borrow area will be the burial of portions of the benthic invertebrate populations that inhabit the borrow area, especially those fauna with sessile and slow-moving lifestyles. Since the entire footprint of Borrow Area B is not being used for material placement (Figure 3), the remaining area where material is not placed can serve as the primary source of colonizing fauna for the recovery of those species into the placement footprint (Van Dolah et al. 1984; Jutte et al. 2002).

#### 4.3.4 FISHERY RESOURCES

**No Action Alternative.** Dredging with hydraulic dredges usually results in little to no effect on adult fishes due to their size and ability to avoid either the drag head or cutterhead. The same cannot

be said of larval fishes and eggs, which lack the ability to avoid the suction near the draghead or cutterhead. Larvae and egg distribution and concentrations in a channel are highly variable on a range of scales (spatially and temporally). Therefore it is important to recognize that not all larvae in an inlet like St. Lucie would be vulnerable to entrainment. Larvae and eggs are not equally distributed in the inlet as the tidal flows in and out of the inlet can show asymmetry. In addition, many larvae exhibit a vertical migration strategy that facilitates tidal stream transport. That is, larvae are up in the water column during flood and descend to near the bottom during ebb; such behavior helps to prevent larvae from being flushed back out the inlet (Settle 2003).

Settle (2003) discussed the National Oceanic and Atmospheric Administration/National Ocean Services' National Centers for Coastal Ocean Science (NOAA) report entitled Assessment of Potential Larval Entrainment Mortality Due to Hydraulic Dredging of Beaufort Inlet. NOAA found, and USACE agrees that "any larvae entrained in the dredge are likely to be killed; it is likely that the impact at the population level would be insignificant" (Settle 2003). In this assessment, NOAA also determined that the use of a 30-inch hydraulic dredge dredging 24-hours a day in Beaufort Inlet, North Carolina, would result in entrainment mortality "even under the worst case scenario" of 0.1% per day where there are high densities of larval fishes (up to 5 larvae per m<sup>3</sup>). This may be informative of potential effects associated with St. Lucie Inlet, although it is far from Beaufort Inlet. USACE is not aware of any studies regarding larval fish or egg densities in or around the St Lucie Inlet. Therefore, USACE assumes that if an inlet such as Beaufort with high densities of larval fishes can be dredged for 24-hours-a-day without significant population level effects to larval fish densities, that the same would hold true at the St. Lucie Inlet, where a significant portion of the larval development habitat is in the nearshore and offshore to the north and south of the Inlet according to previously submitted benthic surveys.

**Dredging and Placement in Borrow Area B.** The effects of dredging on fish are the same as the No Action Alternative. Turbidity can interfere with food gathering processes of filter feeders and organisms that feed by sight as a result of inundation with non-nutritive particles. In addition to altered feeding rates, other biological responses to turbidity include reduced hatching success, slowed growth, abnormal development, tissue abrasion, and increased mortality. Suspension and dispersion processes uncover and displace benthic organisms, temporarily providing extra food for bottom-feeding species.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area "B" (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### **4.4 THREATENED AND ENDANGERED SPECIES**

**No Action Alternative.** Adverse effects of dredging and placement of material on the beach has been reviewed in the SARBO, SPBO and P3BO. Those Biological Opinions include Terms and Conditions (T&Cs) to minimize adverse effects to listed species and provide incidental take authorizations where adverse effects cannot be avoided. USACE is incorporating those T&Cs into the project plans and specifications. As a result of the opinions, the effects of the continued

dredging of the St. Lucie Inlet Federal Navigation Project with placement of dredged material either on the downdrift beaches or in nearshore waters, may adversely affect, but is not likely to jeopardize the continued existence of any listed species.

**Dredging and Placement in Borrow Area B.** The effects of dredging material from the St Lucie Inlet is the same as with the No Action Alternative. The placement of sand from the Inlet into Borrow Area B is not likely to adversely affect any listed species. In compliance with Section 7 of the Endangered Species Act, the project was fully coordinated under the Endangered Species Act as part of the recently authorized Department of Army permit modification (refer to Section 1.4). The applicable conditions of the SARBO issued by NMFS and the SPBO and P3BO issued by the USFWS have been incorporated into the project plans and specifications and will be followed during construction.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

Additional analysis, by species group or species is provided below.

#### 4.4.1 SEA TURTLES

Dredging and the use of the various placement locations (beach, nearshore and Borrow Area B) could potentially directly and indirectly affect sea turtles in several ways, including:

- Dredging activities that utilize a hopper dredge may lethally take or injure sea turtles through entrainment; preventative measures will be taken, including the use of draghead deflectors and monitoring to reduce the potential for entrainment. Placement activities on nesting beaches may affect sea turtles (See SARBO and GRBO for more details).
- Sand placement shall not occur on the beach between May 1 and October 31.
- Escarpment formations and resulting impediments to nesting females as well as potential losses to the beach equilibration process;
- Sediment density (compaction), shear resistance (hardness), sediment moisture content, beach slope, sediment color, sediment grain size, sediment grain shape, and sediment grain mineral content can be altered potentially affecting the nesting and incubating environment;
- Hard sediment can prevent a female turtle from digging a nest or result in a poorly constructed nest cavity;
- Changes in sediment properties and color could alter the temperature of the beach and incubating nests, thus influencing sex ratios.

With respect to effects of hopper dredging on sea turtles, the SARBO (1997) states:

*Therefore, NMFS believes that up to 35 loggerheads may be taken by injury or mortality, as well as 7 Kemp's ridleys, 7 green turtles, 2 hawksbills, and 5 shortnose sturgeon. These takes are not likely to jeopardize the continued existence of these species and the ongoing commitment by the COE to further minimize takes may reduce the likelihood of sea turtle takes in the future*

*even if nearshore sea turtle abundances increase.*

The 1991 SARBO; ( amended in 1995 and 1997; NMFS 1991) states:

*Clamshell dredges are the least likely to adversely affect sea turtles because they are stationary and impact very small areas at a given time. Any sea turtle injured or killed by a clamshell dredge would have to be directly beneath the bucket. The chances of such an occurrence are extremely low, although the take of a live turtle by a clamshell dredge has been documented at Canaveral. On the basis of the best available information, NMFS has determined that dredging with a clamshell dredge is unlikely to result in the take of sea turtles. . . . Pipeline dredges are relatively stationary and only influence small areas at a given time. For a turtle to be taken with a pipeline dredge, it would have to approach the cutterhead and be caught in the suction. This type of behavior would appear unlikely, but may be possible. Presently, NMFS has determined that pipeline dredges are unlikely to adversely affect sea turtles. . . . the special purpose split-hull hopper dredge and sidecast dredges are used in a limited basis in the southeast. These dredges are not believed harmful to sea turtles because of the small size of dragheads (roughly 2' by 2'). For the present consultation, NMFS has determined that these dredges are unlikely to adversely affect sea turtles.*

Of the three major dredge types, only the hopper dredge has been implicated in the mortality of endangered and threatened species. Thus, this biological opinion concentrates on the adverse effects of hopper dredging in the southeastern United States.

In the 1997 SARBO, NMFS also determined that leatherback sea turtles are unlikely to be adversely affected by hopper dredging activities. The USACE plans to minimize effects to nesting sea turtles in the project area by implementing steps that are now common practice including, but not limited to:

- contingency plans;
- risk assessments;
- sediment quality monitoring;
- compaction tests;
- tilling; and
- leveling escarpments in the fill

USFWS biological opinions for similar projects acknowledge that placement of sand on a critically eroded beach can enhance sea turtle nesting habitat if the sand placed is highly compatible (i.e., grain size, shape, color, etc.) with naturally occurring beach sediments at the recipient site, and compaction and escarpment remediation measures are properly adopted (USFWS 2005).

#### 4.4.2 FLORIDA MANATEE

In accordance with Section 7 of the Endangered Species Act, consultation with the USFWS was conducted under the SPBO. USACE has determined that the proposed dredge work may affect, but is not likely to adversely affect manatees. This determination was based on the implementation of

species specific protective measures and the type of dredging equipment typically used to dredge the channel. Regarding protection for manatees, the 2015 USFWS SPBO T&Cs will be followed.

#### 4.4.3 WHALES

Whales are infrequently encountered when work vessels are in transit to either the nearshore placement area or Borrow Area B. In the 1991 SARBO NMFS stated that although several ESA-listed whale species were known to occur along the Atlantic coast (finback, humpback, and sei), it was unlikely that they would be adversely affected by hopper dredging activities. And as clamshell and cutterhead dredges are static, they are also unlikely to affect the species. Therefore, whales are not likely to be struck by vessels. Work crews will monitor for whales during all waterborne work. The USACE has determined that based on NMFS' conclusions, the proposed dredging and placement operations may affect, but are not likely to adversely affect ESA-listed whales in the project area.

#### 4.4.4 SMALLTOOTH SAWFISH

The logic set forth in NMFS' 2003 Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts (GRBO) (as amended in 2005 and 2007) regarding hopper dredge effects to sawfish in the Gulf of Mexico is also applicable to St Lucie Inlet and Martin County where sawfish occurrences are rare. As stated in the GRBO (page 21):

*Smalltooth sawfish (Pristis pectinata) are tropical marine and estuarine fish that have the northwestern terminus of their Atlantic range in the waters of the eastern U.S. Currently, their distribution has contracted to peninsular Florida and, within that area, they can only be found with any regularity off the extreme southern portion of the state. The current distribution is centered in the Everglades National Park, including Florida Bay. They have been historically caught as bycatch in commercial and recreational fisheries throughout their historic range; however, such bycatch is now rare due to population declines, population extirpations and a ban on fishing with floating nets. Between 1990 and 1999, only four documented takes of smalltooth sawfish occurred in shrimp trawls in Florida (Simpendorfer 2000). After consultation with individuals with many years in the business of providing qualified observers to the hopper dredge industry to monitor incoming dredged material for endangered species remains (C. Slay, Coastwise Consulting, pers. comm. August 18, 2003) and a review of the available scientific literature, NOAA Fisheries has determined that there has never been a reported take of a smalltooth sawfish by a hopper dredge, and such take is unlikely to occur because of smalltooth sawfishes' affinity for shallow, estuarine systems. Only hopper dredging of Key West channels would have the potential to impact smalltooth sawfish but those channels are not within the area of influence of this project. Therefore, NOAA Fisheries believes that smalltooth sawfish are rare in the action area, the likelihood of their entrainment is very low, and that the chances of the proposed action affecting them are discountable.*

USACE agrees with this determination and incorporate it into this effects determination.

#### 4.4.5 PIPING PLOVER

The piping plover is known to rarely use the beaches of Martin County (USACE 2011) and placement of dredged O&M material on the beach may displace birds foraging and resting. The displacement

is expected to be short term, and habitat exists outside of the beach placement areas with similar characteristics that may be used by displaced species while placement activities are underway. Birds that use the beach for nesting and breeding are more likely to be affected by beach nourishment than those that use the area for feeding and resting during migration (USDOI/MMS 1999). Piping plovers may be displaced by dredges, pipelines, and other equipment along the beach, or may avoid foraging along the shore if they are aurally affected (Peterson et al. 2001). If the sand placed on the beach is too coarse or high in shell content, it can inhibit the birds' ability to extract food particles in the sand (Greene 2002). Fine sediment that reduces water clarity can also decrease the feeding efficiency of birds (Peterson et al. 2001).

Direct effects to piping plovers from project construction are expected to be minimal as birds are motile and can avoid construction activities. The disposal of sand on the beach may temporarily interrupt foraging and resting activities of shorebirds that utilize the project beach area. This interruption would be limited to the immediate area of disposal and duration of construction. The prey base for many shorebirds, which includes the benthic organisms previously discussed in Section 3.3.3 may be temporarily reduced in the project area. This impact would be short-term as recovery of beach infauna is expected within one year after sand placement.

Placement of dredged material in the nearshore or Borrow Area B would have no effect on piping plover.

#### 4.4.6 RUFA RED KNOT

Like the piping plover, the rufa red knot is also known to rarely use the beaches of Martin County. And as with the plover, placement of dredged O&M material on the beach may displace foraging and resting. The displacement is expected to be short term, and habitat exists outside of the beach placement areas with similar characteristics that may be used by displaced species while placement activities are underway. Direct effects to piping plovers from project construction are expected to be minimal as birds are motile and can avoid construction activities. The disposal of sand on the beach may temporarily interrupt foraging and resting activities of shorebirds that utilize the project beach area. This interruption would be limited to the immediate area of disposal and duration of construction. The prey base for many shorebirds, which includes the benthic organisms previously discussed in Section 3.3.3, may be temporarily reduced in the project area. This impact would be short-term as recovery of beach infauna is expected within one year after sand placement.

Placement of dredged material in the nearshore or Borrow Area B would have no effect on the rufa red knot.

### 4.5 WILDLIFE REFUGES, SANCTUARIES, AND MANAGEMENT AREAS

**No Action Alternative.** Continued placement of O&M dredged material on the beaches of St. Lucie Preserve State Park and Hobe Sound National Wildlife Refuge, or in the nearshore adjacent to the parks, will decrease the effects of erosion on the beaches within those parks.

**Dredging and Placement in Borrow Area B.** No adverse effects to refuges, sanctuaries, and management areas would occur.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.1 ESSENTIAL FISH HABITAT

**No Action Alternative.** The work would temporarily impact nearshore benthic habitat, fishes, and invertebrates in the dredge areas, as well as result in temporary reductions of water quality due to turbidity. After dredging and placement, the water quality will quickly return to pre-dredging conditions, benthic communities would repopulate, and fishes and motile invertebrates would return to the area. These effects are considered to be minor and will not result in an overall adverse impact to essential fish habitat.

**Dredging and Placement in Borrow Area B.** The same effects from the No Action Alternative would occur in association with dredging of the St. Lucie Inlet. Placement of material into Borrow Area B will result in temporary reductions of water quality due to turbidity. After placement in Borrow Area B, the water quality will quickly return to pre-dredging conditions. Placement of dredged material in Borrow Area B will result in burial of the infaunal benthic communities in the placement area, which may be forage for species managed under EFH. If these species are non-motile, or slow moving, they may be buried and die as a result of the burial. However, these effects are considered to be minor and will not result in an overall adverse impact to essential fish habitat.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.2 AIR QUALITY

**No Action Alternative.** The short-term effects from emissions by the dredge and other vessels associated with the project are not anticipated to affect onshore or offshore air quality significantly. Exhaust emissions from vessels associated with the project would have a temporary and localized effect on air quality. There may be temporary and minor unpleasant odors associated with exhaust emissions. Offshore sea breezes are anticipated to disperse pollutants. This project requires no air quality permits.

The work may result in small, localized, and temporary increases in concentrations of NO<sub>x</sub>, SO<sub>2</sub>, CO, VOCs, and PM. Because the project is located in an air quality attainment area, the EPA requires no preliminary air quality conformity assessment.

Emissions associated with the dredge plant would provide the largest contribution to the inventory. However, the total project emissions represent a minor percentage of the existing point and nonpoint and mobile source emissions in Pinellas County. Prevailing winds will quickly disperse any pollutant released into the atmosphere from the project area. Green House Gas emissions will minimally effect global emissions or total United States emissions.



**Dredging and Placement in Borrow Area B.** The effects of this alternative are the same as the No Action Alternative.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.3 WATER QUALITY

**No Action Alternative.** The work would temporarily reduce water quality due to turbidity. After dredging and placement, water quality will quickly return to pre-dredging conditions.

**Dredging and Placement in Borrow Area B.** This project will be performed in compliance with State of Florida water quality standards. Coastal Zone Management Plan consistency was determined through the acquisition of the issuance of Joint Coastal Permit (JCP) to Martin County on September 24, 2014. The JCP included monitoring protocols which requires turbidity monitoring during offshore placement as stated in the approved WQ/QC Plan and Monitoring Plan dated 4 October 2012. The project is expected to cause temporary and insignificant increases in turbidity associated with the dredging, at the borrow area and intertidal swash zone seaward (USACE 2017) of the beach. Due to the relatively low silt content and high density of the material, sand is expected to quickly fall out of the water column and only a short-term increase in turbidity is expected. A turbidity control and monitoring plan is a special condition of the permit to minimize effects to surrounding waters. The Florida Department of Environmental Protection (FDEP) JCP includes conditions for water quality and certifies that the project is consistent with Water Quality Certification. The permit issued by USACE incorporates the requirements to meet state water criteria included in the state permit. The fill material will be free from items such as trash, debris, construction materials, and soils contaminated with any toxic substance, in toxic amounts in accordance with Section 307 of the Clean Water Act. All beach fill material utilized will comply with the FDEP-approved Sediment Quality Assurance/Quality Control Plan (Sediment QA/QC Plan dated 11 October 2012).

No long term adverse impact on water quality is expected to occur as a result of the work. Dredging operations will create minor, temporary reduction of water quality in the vicinity of the construction by increased turbidities. Elevated turbidity levels would occur within the mixing zone in dredging areas and in the return water from the disposal site. Turbidities directly due to dredging are expected to return to ambient levels within a short time period. Water quality certification will be obtained prior to the commencement of any activities associated with this Supplemental EA.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.4 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

**No Action Alternative.** There are no identified HTRW issues associated with this dredging project. If an HTRW issue were to be discovered during operation, the USACE would comply with all applicable state and Federal regulations and guidance to ensure the issue would be addressed and resolved.

**Dredging and Placement in Borrow Area B.** There are no identified HTRW issues associated with this dredging project, so there will be no impact to Borrow Area B associated with HTRW. If an HTRW issue were to be discovered during operation, the USACE would comply with all applicable state and Federal regulations and guidance to ensure the issue would be addressed and resolved.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.5 NOISE

**No Action Alternative.** Temporary minor increases in noise would occur during the dredging and dredged material placement in the vicinity of the construction. Waterways where dredging will occur currently experience elevated background noise associated with navigation activities. Dredging and disposal operations near populated or other noise-sensitive locations may result in increased levels of noise. Some of the dredging and disposal sites are located in remote locations and the noise would attenuate. Local noise ordinances would be implemented to reduce equipment noise. Following dredging and placement operations, noise levels would revert to existing levels.

**Dredging and Placement in Borrow Area B.** The effects associated with noise for placement of dredged material in Borrow Area B are the same as the No Action Alternative.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.6 AESTHETIC RESOURCES

**No Action Alternative.** Dredges, pipelines and heavy equipment will be used during beach placement and may be considered “unsightly” by members of the public. Also temporary air emissions, turbid water and increased noise can also temporarily impact aesthetics. During construction, equipment used for dredging would be visible, resulting in a temporary reduction in the aesthetic value offshore during construction. Impacts to aesthetics depend on the locations of the dredging and disposal areas. Aesthetic values are less likely to be impacted in remote or highly industrialized dredging and disposal areas

**Dredging and Placement in Borrow Area B.** The effects associated with aesthetic values for placement of dredged material in Borrow Area B are the same as the No Action Alternative.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.7 RECREATIONAL RESOURCES

**No Action Alternative.** Short-term impact to recreational boat traffic and beach activities in project vicinity due to the presence of the dredge, support vessels and pipelines. Long-term benefits by maintaining recreational opportunities associated with maintaining the beach. Failure to maintain inlet would have negative impacts on recreational use of inlet.

**Dredging and Placement in Borrow Area B.** The effects associated with recreational resources for placement of dredged material in Borrow Area B are the same as the No Action Alternative.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.8 SOCIOECONOMICS

**No Action Alternative.** Based on the continued use of St. Lucie Inlet by recreational and commercial vessels, it is evident that if maintenance dredging of the channel does not continue, there would be a deleterious effect on the local and regional socioeconomic environment.

**Dredging and Placement in Borrow Area B.** The regional social and economic benefits that are based on navigation associated with the St Lucie Inlet Federal Navigation project would continue. Use of Borrow Area B as a placement site would have beneficial effects on decreasing the costs associated with sand procurement for the Town of Jupiter Island for their ongoing shore protection project.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.9 NAVIGATION AND PUBLIC SAFETY

**No Action Alternative.** The No Action Alternative would result in shoaling and shallowing of the channel. As shoaling continues, the navigability of the channel would decrease. Because vessels would tend to use the center of the channel, shoaling at the sides would result in a narrowing of the channel, which would affect public safety by increasing the potential for collisions.

**Dredging and Placement in Borrow Area B.** The work would result in some temporary disruption of normal vessel traffic in the ship channel due to the presence and operation of the dredged material transport and disposal equipment. This temporary effect is considered only a minor inconvenience to navigation.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.10 NATIVE AMERICANS

No portion of the proposed action is located within or adjacent to known Native American-owned lands, reservation lands, or Traditional Cultural Properties.

**No Action Alternative.** There will be no effect to Native Americans with the No Action Alternative.

**Dredging and Placement in Borrow Area B.** There will be no effect to Native Americans with the dredging of the St. Lucie Inlet with placement of the dredged material in Borrow Area B.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.11 CULTURAL RESOURCES

As discussed in the Section 3: Affected Environment portion of this document, substantial cultural resources work and investigations have been conducted throughout various portions of the project area. Previous consultation with the Florida SHPO and the appropriate federally-recognized tribes on recurrent maintenance dredging of the St. Lucie Inlet Navigation Project and placement of dredge material on the beaches south of the inlet and in the nearshore environment has indicated that the Proposed Action will have no effect on cultural resources listed or eligible for listing in the NRHP;

**No Action Alternative.** The No Action Alternative would have no effect to cultural resources listed or eligible for listing in the NRHP.

**Dredging and Placement in Borrow Area B.** The Proposed Action would have no effect to cultural resources listed or eligible for listing in the NRHP.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.12 ENERGY REQUIREMENTS AND CONSERVATION

**No Action Alternative.** The work will involve the use of fuel to power dredges, pumps, and associated machinery in conjunction with the maintenance of the Federal channel and placement of dredged material.

**Dredging and Placement in Borrow Area B.** The work will involve the use of fuel to power dredges, pumps, and associated machinery in conjunction with the maintenance of the Federal

channel and placement of dredged material.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.13 NATURAL OR DEPLETABLE RESOURCES

**No Action Alternative.** No direct effects caused by the work on natural/depletable resources would occur. However, indirect effects include the use of fuel for construction and operations (petroleum depletion), machinery wear and tear (metal ore depletion), and similar effects. However, these effects are considered to be of minor consequence.

**Dredging and Placement in Borrow Area B.** No direct effects caused by the work on natural/depletable resources would occur. However, indirect effects include the use of fuel for construction and operations (petroleum depletion), machinery wear and tear (metal ore depletion), and similar effects. However, these effects are considered to be of minor consequence.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

#### 4.5.14 CUMULATIVE EFFECTS

Cumulative effects are defined in 40 CFR 1508.7 as those effects that result from:

...the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Cumulative environmental effects for the proposed project were assessed in accordance with guidance provided by the President’s Council on Environmental Quality (CEQ). Cumulative environmental effects were also evaluated in the NEPA documents listed in Section 1.4.

Past projects in the St. Lucie Inlet include the previous O&M dredging conducted by USACE and the non-federal local sponsor with placement of the dredged material on the beach or in the nearshore including the staging of dredge equipment at Pecks Lake. A Cumulative Effects Analysis for the continued O&M of the St. Lucie Inlet was included in the 1994 EA and the 2000 EA; and a Cumulative Effects Analysis was included in the 2011 EA for staging equipment at Pecks Lake. All three of these analyses are incorporated by reference. Other than the ongoing O&M of St. Lucie Inlet, there are no other known activities that are taking place that should be included in a Cumulative Effects Analysis.

The only other project likely to take place in the foreseeable future besides the ongoing O&M of St. Lucie Inlet, is the ongoing Martin County Shore Protection Project (MCSPP) (USACE 2011) would “primary impact the beach, nearshore hardbottom resources, offshore sand borrow areas and associated habitats.” A detailed Cumulative Effects Analysis was included in the FEIS for that project (USACE 2011) and is incorporated by reference.

Continued maintenance of the St. Lucie Inlet and placement of sand on the beach or in the nearshore would also impact many of the same resources as the MCSPP. The MCSPP will continue to maintain the beaches at least through the end of its federally authorized lifespan, 2046. It is expected that St. Lucie Inlet will continue to be maintained for the foreseeable future with placement of sand from those O&M dredging events on the beach, in the nearshore, or in Borrow Area B. The cumulative effects of all three of these placement locations are similar in nature. All allow for the continued maintenance of the beach profile, and its storm damage reduction benefits. These long term effects on these resources, with the continuation of O&M dredging of the St. Lucie Inlet are not significant.

#### 4.5.15 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

**No Action Alternative.** The No Action Alternative will result in the continued O&M dredging of the St. Lucie Inlet with placement of dredged material either on the beach or in the nearshore. There are unavoidable adverse environmental effects associated with the No Action Alternative as previously detailed in the NEPA documents in Section 1.4, and in Table 1.

**Dredging and Placement in Borrow Area B.** Continued O&M dredging of the St. Lucie Inlet with placement of dredged material in Borrow Area B will have some unavoidable impacts to sea turtles swimming in the water if hopper dredges are used. Additionally, marine animals (including fishes and marine mammals) may experience increase noise, and turbidity associated with the placement of material in Borrow Area B. Infaunal resources that live inside the boundaries of the placement area may also be adversely effected due to burial under dredged material as it is placed into the borrow area. All of these effects are expected to be short term, and minor in nature.

**Dredging with Placement in Existing Nearshore and Beach Template Areas and Borrow Area “B” (Preferred Alternative).** Effects would be a combination of the No Action Alternative and dredging and placement in Borrow Area B.

## **5 ENVIRONMENTAL COMMITMENTS**

USACE shall comply with all terms and conditions of the revised SPBO and the SARBO, the Conservation Measures of the PB30, and the State's JCP issued for the project. The PB30 conservation measures will also minimize effects to red knots. The USACE also commits to avoiding, minimizing, or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications.

### **5.1 PROTECTION OF FISH AND WILDLIFE RESOURCES**

The Contractor shall keep construction activities under surveillance, management, and control to minimize interference with, disturbance to, and damage of fish and wildlife. Species that require specific attention along with measures for their protection shall be listed in the Contractor's Environmental Protection Plan (EPP) prior to the beginning of construction operation.

### **5.2 ENDANGERED SPECIES PROTECTION**

USACE and contractors commit to avoiding, minimizing or mitigating for adverse effects to sea turtles, manatees, and sawfish during construction activities. USACE has included the T&Cs of the SPBO for sand placement and the SARBO for dredging in the project specifications. The Contractor shall also include protection criteria for Endangered and Threatened species protections in their EPP.

### **5.3 WATER QUALITY**

The USACE Contractor will prevent oil, fuel, or other hazardous substances from entering the air or water. This will be accomplished by design and procedural controls. All wastes and refuse generated by project construction would be removed and properly disposed. The USACE contractor will implement a spill contingency plan for hazardous, toxic, or petroleum material for the borrow area. A Section 401 Water Quality Certification/State JCP was issued to Martin County, the project non-federal sponsor, and the project will be utilizing that permit. The Contractor shall monitor water quality (turbidity) at the dredging and beach placement sites, as required by the State JCP.

### **5.4 CULTURAL RESOURCES**

An unexpected cultural resources finds clause has been included in the project specifications. Anomalies of interest at Borrow Area B have been designated as avoidance areas and no dredged material can be placed in those areas.

In the event that the dredge operators discover any archaeological resource while conducting dredging operations, dredge operations will be halted immediately within the area. If investigations determine that the resource is significant, state and Federal agencies would determine how best to protect it.

### **5.5 PROTECTION OF MIGRATORY BIRDS**

USACE will incorporate the standard migratory bird protection protocols into the project plans and specifications and will require the contractor to abide by those requirements for the No Action

Alternative. Protections of migratory birds on the beach is not an issue for the preferred alternative.

## **5.6 HARBOTTOM HABITATS**

Mapped hardbottom habitats have been protected through the implementation of a 400 ft. wide buffer from all dredging activities (including anchor points). The closest hardbottom habitat is more than 1,000 feet east of Borrow Area B. A post-dredging monitoring survey of the hardbottoms in the vicinity of Borrow Area B was conducted by the Town of Jupiter Island as part of their permit to utilize Borrow Area B. USACE will utilize that monitoring event as the pre-dredge condition for the dredged material placement activities within Borrow Area B. USACE will conduct a hydrographic post-placement monitoring event to determine any effects the placement may have add on the hardbottoms in the vicinity of Borrow Area B, and the Town of Jupiter Island will continue their monitoring program associated with the use of Borrow Area B as a sand source for their on-going nourishment program.



## **6 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS**

### **6.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969**

Environmental information on the project has been compiled, and this EA has been prepared. The final EA and signed FONSI will be made available to the public and a notice of availability of the signed FONSI will be sent to interested parties. The project has also undergone numerous reviews under NEPA as detailed in Section 1.4. This EA summarizes and incorporates those findings by reference. The project is in compliance with NEPA.

### **6.2 ENDANGERED SPECIES ACT OF 1973**

This project has been coordinated with NMFS through the SARBO dated 25 September 1997. By letter dated 25 October 2007, NMFS instructed USACE to continue to apply the 1997 SARBO on all O&M dredging projects while NMFS completes the new SARBO. That document is not yet complete. For species under the jurisdiction of the USFWS, the USACE will use the SPBO dated 13 March 2015 and the P3BO dated 22 May 2013 for dredging and placement activities for St. Lucie Inlet O&M. The conservation recommendations included in the P3BO will also provide protections to the rufa red knot. USACE received a concurrence from USFWS that the proposed project is covered by the SPBO and P3BO in a 12 April 2017 letter from the USFWS. This letter is included in Appendix A. This project has been fully coordinated under the Endangered Species Act and is in full compliance with the Act.

### **6.3 FISH AND WILDLIFE COORDINATION ACT OF 1958**

Each activity constructed pursuant to this NEPA document has been coordinated with the USFWS in accordance with the Fish and Wildlife Coordination Act (FWCA) prior to construction. This project is in full compliance with this Act.

### **6.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)**

The Proposed Action is in compliance with Section 106 of the National Historic Preservation Act, as amended (PL89-665). As part of the requirements and consultation process contained within the National Historic Preservation Act implementing regulations of 36 CFR 800, this project is also in compliance through ongoing consultation with the Archaeological and Historic Preservation Act, as amended (PL93- 29), Archeological Resources Protection Act (PL96-95), American Indian Religious Freedom Act (PL 95- 341), Native American Graves Protection and Repatriation Act (NAGPRA), Executive Order 11593, 13007, and 13175, the Presidential Memo of 1994 on Government to Government Relations and appropriate Florida Statutes. Consultation with the SHPO for each aspect of this project has been completed.

- 1994 EA – “An archival and literature review, including a review of the current National Register of Historic Places listing and consultation with the Florida State Historic Preservation Officer (SHPO), was conducted to determine if significant cultural resources are present in the project area. No significant archeological sites or historic properties are recorded in the project area, and the area is judged to have little potential for containing significant cultural resources. No response from the SHPO was received during the public notice period. Therefore, the project would be in compliance.”
- 2000 EA – “In a letter dated 22 April 1999 the proposed action was coordinated with the

State Historic Preservation Officer (SHPO) concerning historic resources. In that letter the USACE' determined that the proposed action at St. Lucie Inlet would not affect significant historic properties. In a letter dated August 5, 1999, the SHPO concurred with this determination.”

- 2011 EA - In a November 18, 2011 letter, the SHPO concurred with the determination that no historic properties eligible for listing in the National Register would be adversely affected by the project.
- 2017 MFR/SOF for RD permit - A project specific SHPO consultation was conducted and in a 16 February 2016 letter, the SHPO determined that the proposed project activities were unlikely to affect historic properties if the following specific conditions are followed. The specific conditions are based on the use of Borrow Area B by the Town of Jupiter Island as a sand source under Department of Army (DA) permit SAJ-1992-01740(MOD) dated 13 November 2015. The SHPO requested the following special condition be incorporated into the DA permit.

#### **6.5 CLEAN WATER ACT OF 1972**

Maintenance dredging with placement into Borrow Area B is covered by Section 401 of the Clean Water Act (CWA). The issuance of the JCP to Martin County provides the analysis for the project's compliance with Section 401 of the CWA. All state water quality requirements will be met. The project is in full compliance with this Act.

#### **6.6 CLEAN AIR ACT OF 1972**

The short-term impacts from construction equipment associated with the project would not significantly impact air quality. No air quality permits would be required for this project. Martin County is designated as an attainment area for Federal air quality standards under the Clean Air Act. Because the project is located within an attainment area, USEPA's General Conformity Rule to implement Section 176(c) of the Clean Air Act does not apply and a conformity determination is not required.

#### **6.7 COASTAL ZONE MANAGEMENT ACT OF 1972**

The state of Florida's issuance of the JCP for the project is their determination in accordance with 15 C.F.R. 930 Subpart C.

#### **6.8 FARMLAND PROTECTION POLICY ACT OF 1981**

No prime or unique farmland will be impacted by implementation of this project. This act is not applicable.

#### **6.9 WILD AND SCENIC RIVER ACT OF 1968**

No designated wild and scenic river reaches will be affected by project related activities. This act is not applicable.

#### **6.10 MARINE MAMMAL PROTECTION ACT OF 1972**

To ensure the protection of any manatees, whales, or dolphins present in the project area, incorporation of safeguards used to protect these species have been included in the project plans

and specifications and will be implemented by the contractor during dredging and placement operations. In addition, if dredging is conducted with a clamshell dredge, a dedicated manatee monitor will be assigned to watch for manatee conflicts. Therefore, this project shall be in compliance with the Act.

#### **6.11 ESTUARY PROTECTION ACT OF 1968**

No designated Estuary of National Significance will be affected by project related activities. This act is not applicable.

#### **6.12 FEDERAL WATER PROJECT RECREATION ACT**

The principles of the Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1 (12), *et seq.* P.L. 89-72, do not apply to this project.

#### **6.13 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976, AS AMENDED**

In compliance with the Magnuson Stevens Act, the project was fully coordinated under the Essential Fish Habitat consultation as part of the recently authorized Department of Army modification (refer to Section 1.4). NMFS provided one conservation recommendation by letter dated 22 February 2016, "To reduce impacts to larval fishes, the permit should maintain the requirement for dredging to occur only during winter months (November 1 to April 30)". The USACE responded to this recommendation on 23 February 2017 rejecting the recommendation due to the findings of Settle (2003) and the potential to remove flexibility to maintain the channel when conditions threaten safe navigation (e.g. after a hurricane or large storm).

#### **6.14 SUBMERGED LANDS ACT OF 1953**

The project would occur on submerged lands of the State of Florida. The project was coordinated with the State via the issuance of their JCP, and is in compliance with the Act.

#### **6.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990**

The Coastal Barrier Resources Act (CBRA) and the Coastal Barrier Improvement Act of 1990 (CBRIA) limit federally subsidized development within the CBRA Units to limit the loss of human life by discouraging development in high risk areas, to reduce wasteful expenditures of Federal resources, and to protect the natural resources associated with coastal barriers. CBRIA provides development goals for undeveloped coastal property held in public ownership, including wildlife refuges, parks, and other lands set aside for conservation (OPAs). These public lands are excluded from most of the CBRA restrictions, although they are prohibited from receiving Federal Flood Insurance for new structures.

Federal monies can be spent within the CBRS for certain activities, including (1) projects for the study, management, protection, and enhancement of fish and wildlife resources and habitats; (2) establishment of navigation aids; (3) projects funded under the Land and Water Conservation Fund Act of 1965; (4) scientific research; (5) assistance for emergency actions essential to saving lives and the protection of property and the public health and safety, if preferred pursuant to the Disaster Relief Emergency Assistance Act and the National

Flood Insurance Act and are necessary to alleviate the emergency; (6) maintenance, repair, or reconstruction, but not expansion, of publically owned or publically operated roads, structures, or facilities; (7) nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore a natural stabilization system; (8) any use or facility necessary for the exploration, extraction, or transportation of energy resources; (9) maintenance or construction of improvements of existing Federal navigation channels, including the disposal of dredge materials related to such projects; and (10) military activities essential to national security.

There is one CBRA and CBRIA units in the project area (see Section 3.11 ). The proposed project does not include the construction of structures that would require Federal Flood Insurance in any areas designated as “otherwise protected areas” pursuant to the CBRIA; therefore, Federal expenditures for the proposed project should not be restricted in these areas. The activities proposed in the remainder of the CBRA units in the project area are consistent with the intent of these Acts. The project is in compliance with these Acts.

#### **6.16 RIVERS AND HARBORS ACT OF 1899**

The proposed work will not obstruct navigable waters of the United States. USACE does not permit itself for civil works projects. As such, the activity discussed in this EA is in compliance from the intent of the Act.

#### **6.17 ANADROMOUS FISH CONSERVATION ACT**

Anadromous fish species are not likely to be affected. The project was coordinated with both NMFS and the USFWS, and is in compliance with this Act.

#### **6.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT**

USACE has included migratory bird protection measures in the project plans and specifications for operations on the beach placement areas. If nesting activities occur within the construction area, appropriate buffers will be placed around nests to ensure their protection if the No Action Alternative is used. If the preferred alternative is constructed, no impacts to migratory birds are expected. The project is in compliance with these Acts.

#### **6.19 MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT**

The term *dumping* as defined in the Act [33 U.S.C. 1402(f)] does not apply to the disposal of material for beach nourishment or to the placement of material for a purpose other than disposal (i.e., placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Material placed on the beach, in the nearshore or in Borrow Area B would not unreasonably degrade or endanger human health or the marine environment. Therefore, the project is in compliance with this Act.

#### **6.20 UNIFORM RELOCATION ASSISTANCE AND REAL PROPERTY ACQUISITION POLICIES ACT OF 1970**

The purpose of PL 91-646 is to ensure that owners of real property to be acquired for Federal and federally assisted projects are treated fairly and consistently and that persons displaced as a direct result of such acquisition will not suffer disproportionate injuries as a result of projects designed

for the benefit of the public as a whole. This project shall not acquire property. Therefore, this Act is not applicable.

#### **6.21 E.O. 11990, PROTECTION OF WETLANDS**

No wetlands will be affected by project activities. This project is in compliance with the goals of this Executive Order.

#### **6.22 E.O. 11988, FLOOD PLAIN MANAGEMENT**

To comply with Executive Order 11988, the policy of USACE is to formulate projects that, to the extent possible, avoid or minimize adverse effects associated with the use of the floodplain and avoid inducing development in the floodplain unless there is no practicable alternative. No activities associated with this project are located within a floodplain, which is defined by EO 11988 as an “area which has a one percent or greater chance of flooding in any given year.” The project is in compliance with the Executive Order.

#### **6.23 E.O. 12898, ENVIRONMENTAL JUSTICE**

On February 11, 1994, the President of the United States issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. The Executive Order mandates that each Federal agency make environmental justice part of the agency mission and to address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs and policies on minority and low-income populations. There are no disproportionate adverse impacts to minority or low income populations resulting from the implementation of the project. The project is in compliance.

#### **6.24 E.O. 13045, DISPARATE RISKS INVOLVING CHILDREN**

On April 21, 1997, the President of the United States issued Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks. The Executive Order mandates that each Federal agency make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks. As the proposed action does not affect children disproportionately from other members of the population, the proposed action would not increase any environmental health or safety risks to children.

#### **6.25 E.O. 13089, CORAL REEF PROTECTION**

While there are no coral reefs near the project area, there are hardbottom habitats that support some coral species approximately 1,000 feet west of Borrow Area B. Due to their distance from the Borrow Area, and the classification of the dredged material as sand, it is unlikely that adverse effects to these hardbottom habitats will occur. The hardbottoms associated with Borrow Area B have been monitored in an ongoing basis since October 1989 and to date the use of Borrow Area B as a sand source for the Town of Jupiter Island’s shore protection project has not resulted in adverse impact to the hardbottoms. Based on a review of the most recent pre- and post-dredging monitoring reports, USACE expects that placement of dredged material into Borrow Area B will not adversely affect these resources. A post-placement monitoring event will occur to verify this

determination.

#### **6.26 E.O. 13112, INVASIVE SPECIES**

The proposed action will require the mobilization of dredge equipment from other geographical regions. Dredge equipment has the potential to transport species from one region to another, introducing them to new habitats where they are able to out-compete native species. The benefits of the proposed project outweigh the risks associated with the very slight potential for introducing non-native species to this region.

#### **6.27 E.O. 13186, MIGRATORY BIRDS**

This Executive Order requires, among other things, a Memorandum of Understanding (MOU) between the Federal Agency and the USFWS concerning migratory birds. Neither the Department of Defense MOU nor the USACE's Draft MOU clearly address migratory birds on lands not owned or controlled by USACE. For many USACE civil works projects, the real estate interests are provided by the non-Federal sponsor. Control and ownership of the project lands remain with a non-Federal interest. Measures to avoid the destruction of migratory birds and their eggs or hatchlings are described in a section above on the Migratory Bird Treaty Act. USACE will include our standard migratory bird protection requirements in the project plans and specifications and will require the contractor to abide by those requirements.

## **7 PUBLIC/AGENCY COORDINATION**

### **7.1 SCOPING AND DRAFT EA**

The project as proposed was previously coordinated under a DA permit modification issued by USACE Regulatory on 4 May 2017. The issuance of this permit modification was preceded by a 30-day public notice period. USACE Civil Works will provide a Notice of Availability of the final EA and signed FONSI.

### **7.2 AGENCY COORDINATION**

The proposed project has been and will continue to be coordinated with the following agencies: U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Florida State Clearinghouse, Florida State Historic Preservation Officer, Florida Fish and Wildlife Conservation Commission, and the Florida Department of Environmental Protection.

## 8 LIST OF PREPARERS

Name	Organization	Expertise	Role in Preparation
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