SEPTEMBER 2012

Final Environmental Assessment

MAINTENANCE DREDGING FORT MYERS BEACH HARBOR WITH BEACH AND NEARSHORE PLACEMENT

LEE COUNTY, FLORIDA

U.S. Army Corps
of Engineers
JACKSONVILLE DISTRICT

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

MAINTENANCE DREDGING WITH BEACH AND NEARSHORE PLACEMENT FORT MYERS BEACH HARBOR FEDERAL NAVIGATION PROJECT

LEE COUNTY, FLORIDA

FINDING OF NO SIGNIFICANT IMPACT

I have reviewed the Environmental Assessment (EA) for the proposed maintenance dredging of the federally authorized Fort Myers Beach Harbor Navigation Project in Lee County, FL. Dredged material would be placed either on the beach or in the nearshore placement areas. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

a. The proposed action would be conducted in accordance with the Endangered Species Act, and specifically in compliance with the Gulf Regional Biological Opinion (GRBO) issued by the National Marine Fisheries Service (NMFS) and the Statewide Programmatic Biological Opinion (SPBO) and project specific piping plover Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service (USFWS). The work would not jeopardize the continued existence of any threatened or endangered species or adversely modify critical habitat. In addition, per the final critical habitat rule (Federal Register Volume 74, No. 169, page 45361) the project footprint does not contain the essential features of smalltooth sawfish critical habitat. Therefore the proposed action would not impact critical habitat for this species.

b. This project was coordinated with the State of Florida, and all applicable water quality standards will be met.

c. The State concurred with the Corps Coastal Zone Management Act (CZMA) consistency determination (Appendix B of the EA) and the proposed action is consistent with the enforceable policies of the Florida Coastal Management Program.

d. Six cultural resources anomalies have been identified within the proposed nearshore placement area and pipeline route. All are currently located below the sediment surface and will not be impacted by sand placement over them. To further protect each of these areas the U.S. Army Corps of Engineers (Corps) will establish a minimum of a 100 foot buffer around all six potential significant anomalies.

Within all buffers, no anchoring, spudding or direct outfall will be permitted. The Corps has determined that the proposed dredging will pose no adverse effect to historic properties as the dredging buffers will provide sufficient protection to identified anomalies. Finally, as stated in Section 2.3 of the attached EA, additional cultural resource investigations would be required prior to use of the beach placement area.

e. Public benefits will be provided with unobstructed channel navigation and beach recreation.

f. Measures will be in place during construction to eliminate, reduce, or avoid adverse impacts below the threshold of significance to fish and wildlife resources including the following:

1. Maintenance dredging would occur within the footprint of the previously maintained Federal channel as would beach and nearshore placement occur within the template of previously permitted and authorized placement areas;
2. All water based activities would follow standard manatee, sea turtle and smalltooth sawfish protection measures and the conditions of the NMFS GRBO; dredged material placement would comply with the Operations & Maintenance dredging conditions of the USFWS SPBO and project specific piping plover BO;
3. The Jacksonville District's Migratory Bird Protection Plan would be followed during the nesting season;

In consideration of the information summarized, I find that the proposed Federal Navigation Project, maintenance dredging of Fort Myers Beach Harbor with beach and nearshore placement of dredged material, will not significantly affect the human environment and does not require an Environmental Impact Statement. A copy of this document will be made available to the public at the following website:

http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_LeeCo.htm.

Alan M Dodd

ALAN M. DODD.
Colonel, Corps of Engineers
Commanding

20 Sep 2012

Date

FINAL ENVIRONMENTAL ASSESSMENT

MAINTENANCE DREDGING
FORT MYERS BEACH HARBOR
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1 PROJECT PURPOSE AND NEED

1.1 INTRODUCTION

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is proposing to conduct periodic maintenance dredging of the Federal Fort Myers Beach Harbor (FMBH) project (a.k.a. Matanzas Pass) in Lee County, FL. This would include FMBH Cuts 1-10, wideners and the turning basin (see Figure 1, Project Map). It is anticipated that all of the dredged material would be placed either on the beach between Florida Department of Environmental Protection (DEP) monuments R-178 to R-184 or in the nearshore placement area between DEP monuments R-182 to R-187A. The Federal channel would be maintained to its authorized dimensions of 150-feet wide by 12-feet deep plus 2-feet of allowable over-depth at mean lower low water (MLLW) from San Carlos Bay to Matanzas Pass (FMBH Cuts 1-6) and 125-foot wide by 11-foot deep plus 2-feet of allowable over-depth at MLLW through the Pass to the upper shrimp terminals (FMBH Cuts 7-10 and the turning basin). The accumulation of sediment commonly referred to as shoaling routinely restricts the width of the project channel and reduces its depths.

1.2 PROJECT AUTHORITY

1.2.1 PROJECT AUTHORIZATION

The Rivers and Harbors Act Section 110, approved 17 May 1950 (Public Law 516, 81th Congress, 2st session), provided the authorization for "feasibility of providing a permanent channel form the Gulf of Mexico into Fort Myers Beach, Estero Island, Florida." On 23 June 1959 House Document 183 86/11 authorized construction of an improved channel 12-foot deep and 150-foot wide from the San Carlos Bay to the Matanzas Pass, thence 11-foot deep and 125-foot wide through the Pass to the upper shrimp terminals, a total distance of approximately 2.5 miles.

1.3 PROJECT LOCATION

1.3.1 MAINTENANCE DREDGE AREA

FMBH is a Federal navigation channel located north of Estero Island near the city of Fort Myers Beach, Lee County, FL. The dredge site is located within the federally authorized channel Cuts 1-10 and the turning basin, in Section 24, Township 46 South, Range 23 East, which separates San Carlos Bay from the Gulf of Mexico, a Class III Water (see Figure 1).

1.3.2 BEACH PLACEMENT AREA

The beach placement area is located along the shoreline of Fort Myers Beach on Estero Island between DEP Reference Monuments R-178 to R-184 in Section 24, Township 46 South, Range 23 East, in Fort Myers Beach, Lee County, FL.

1.3.3 NEARSHORE PLACEMENT AREA

The nearshore placement area is located in the nearshore portion of Estero Island, between DEP Reference Monuments R-182 and R-187A immediately east of the Fort Myers Beach Pier, see **Figure 2**. The placement site encompasses some 57.9 acres and is located between 200 feet and 700 feet water ward of the mean lower low water (MLLW) of Fort Myers Beach in the Gulf of Mexico. The estimated capacity of the nearshore placement area is approximately 335,000 cubic yards.

Figure 1. Project Location Map.

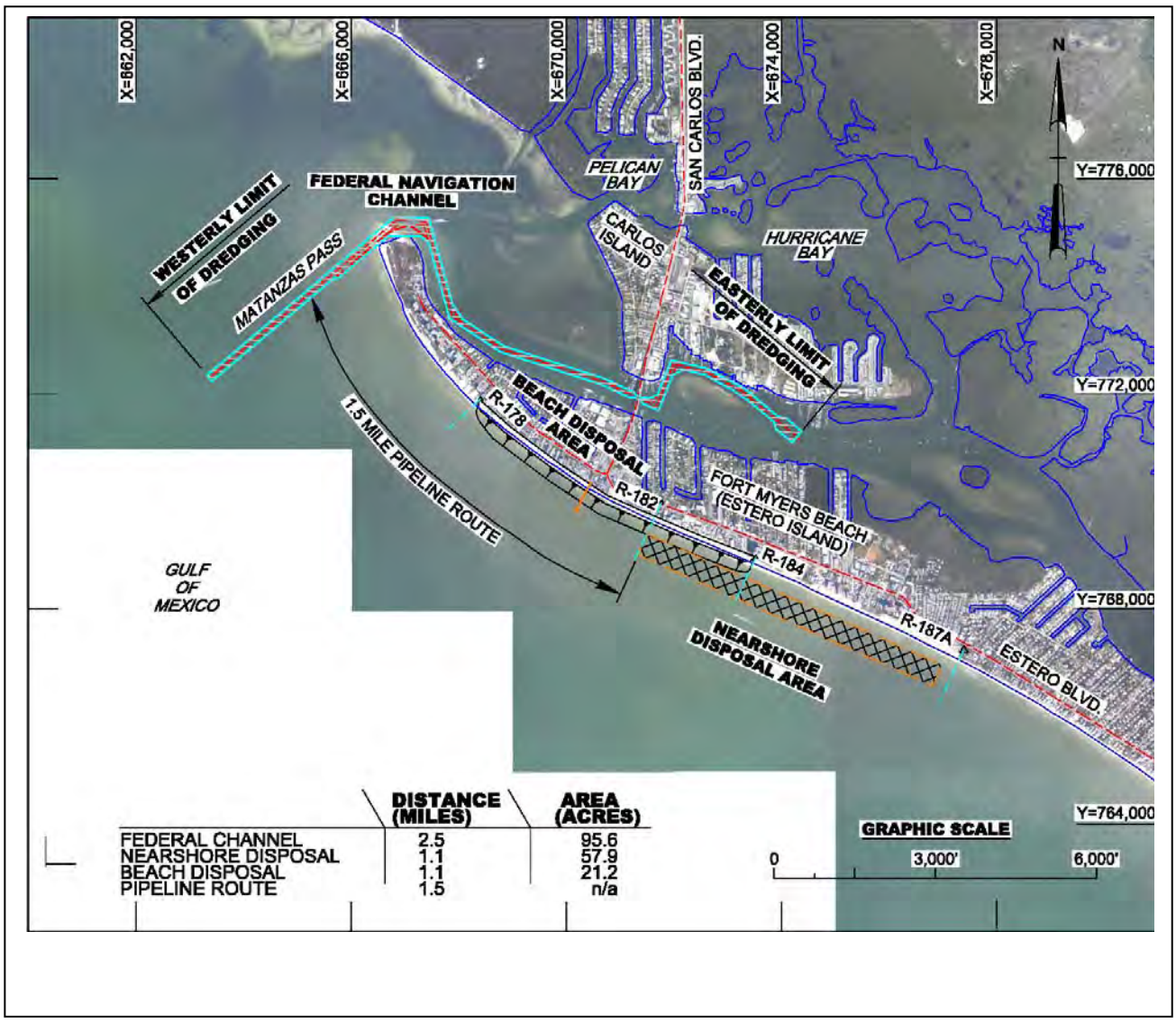


Figure 2. Nearshore Placement area offshore Fort Myers Beach on Estero Island.

1.4 PROJECT NEED OR OPPORTUNITY

The relatively high rate of shoaling within the FMBH necessitates frequent maintenance dredging. Last dredged in 2009, the most recent examination survey documented a total in situ shoaling volume of approximately 120,000 cubic yards (cy) within the authorized channel. Minimum depths recorded from the project channel are less than 0 ft causing navigation problems for commercial and recreational vessels. Vessels are currently being forced outside the authorized channels in search of deeper water, waiting for high tides, or prop dredging through the channels. Removal of the shoal material would maintain the navigable capacity of the project channel. In addition, placement of dredged material on the beach or in the nearshore environment off the southwest shoreline of Estero Island could alleviate erosion on this DEP designated critically eroded beach.

1.5 DECISION TO BE MADE

This Environmental Assessment (EA) will evaluate whether to conduct periodic maintenance dredging of FMBH, Lee County, FL (hereafter project channels) and, if so, recommend alternatives to accomplish that goal.

1.6 PROJECT HISTORY AND RELATED DOCUMENTS

1.6.1 PROJECT HISTORY

Fort Myers Beach Harbor is the primary access for commercial excursion, fishing, and U.S. Coast Guard (USCG) vessels. Initial dredging was authorized by Congress in June, 1959 (House Doc. 183/86/11). The actual dredging activity occurred in May 1961. A Right of Way easement (Doc #23192), recorded on 22 August 1962, granted the easement for channel navigability and

sovereign lands. It described the land for the improvement and maintenance of Fort Myers Beach Harbor, Lee County, signed by Governor Bryant.

Rapid shoal build-up of the channel, particularly adjacent to Bowditch Point, has required continued attention. Maintenance dredging of this Federal channel has been performed in 1967, 1972, 1979, 1986, 2001 and 2009, with dredged material placed either in open-water or on the beach or nearshore of Estero Island (see table 1).

Table 1. Fort Myers Beach Harbor Dredging History

Year	Dredge Location	Dredge Type and placement location	Quantity of dredged material (cubic yards)
1961	Cut 1 and 2A Cut-3 thru 6 Cut-7 thru Turning Basin	Clamshell Bucket and Hydraulic Pump-out to Open-water Placement	215,000 6,000 44,000
1967	Cut 1 and 2A Cut-3 thru 6 Cut-7 thru Turning Basin	Clamshell Bucket to Open-water Placement	57,793 2,000 1,000
1972	Cut 1 and 2A Cut-3 thru 6 Cut-7 thru Turning Basin	Cutter Suction – Pipeline to Beach Placement ***Construction Dredging***	105,000 5,000 42,000
1979	Cut 1 and 2A Cut-3 thru 6	Cutter Suction – Pipeline to Beach Placement	177,808 2,000
1986	Cut 1 and 2A Cut-3 thru 6	Cutter Suction – Pipeline to Beach Placement	90,000 4,000
2001	Cut 1 and 2A	Cutter Suction – Pipeline to Nearshore Placement Area	185,000
2009	Cut 1 and 2A	Cutter Suction – Pipeline to Nearshore Placement Area	229,313

The 2009 project consisted of emergency maintenance dredging of the Federal channel at the mouth of Fort Myers Beach Harbor, in San Carlos Bay, Lee County, Florida. The Federal navigation channel was dredged in Cuts 1 and 2A in the vicinity of Bowditch Point to a 12-foot required depth plus 2 feet of allowable overdepth starting on May 24, and ending on 16 July 2009. An advanced maintenance area that adjoins Cut 1 and 2A at the tip of Bowditch Point was also included in the project. The quantity of material that was dredged totaled 229,313 cubic yards. The dredge activity included the removal of approximately 1.6 acres of upland beach that had accreted into the channel via longshore sediment transport. All dredged material was placed in the nearshore dredged material placement area adjacent to Estero Island (between DEP monuments R-182 and R-187A), see **Figure 2**. The activity also included clearing, grubbing, and hauling, along with turbidity and endangered species monitoring.

1.6.2 RELATED ENVIRONMENTAL DOCUMENTS

- Statement of Findings and Environmental Assessment (EA) in association with Corps Regulatory Division (RD) Permit SAJ OD-ON issued on 10 August 1979. Maintenance dredging Fort Myers Beach channel with beach placement. U.S. Army Corps of Engineers. Jacksonville, FL. 1979.

- Finding of No Significant Impact (FONSI) and EA dated 5 April 1985. Maintenance dredging of predominantly sandy material from the Federal navigation channel at Fort

Myers Beach with the dredged material deposited on Fort Myers Beach below mean high water (MHW). U.S. Army Corps of Engineers. Jacksonville, FL. 1985.

- FONSI and After-the-fact EA. Emergency maintenance dredging of the Matanzas Pass with nearshore placement. U.S. Army Corps of Engineers. Jacksonville, FL. 2012.

1.7 PERMITS REQUIRED AND ENVIRONMENTAL COMPLIANCE

Maintenance operations undertaken by the Corps require compliance with Section 401 of the Clean Water Act (33 USC §1251 et seq.), as amended or 401 Water Quality Certification. This certification is obtained from the DEP. Application to obtain the State's water quality certification was submitted to the DEP in January 2006. A Consolidated Joint Coastal Permit (JCP) was issued by the DEP on 9 March 2009. The expiration date of the construction phase is 6 March 2019. The permit authorizes maintenance dredging of FMBH Federal navigation channel Cuts 1 through 3 to restore and maintain the channel to an authorized depth of -12 feet MLLW plus a 2-foot allowable overdepth; and for the placement of approximately 240,000 cubic yards of dredged material to be placed in the nearshore, seaward of the sand bar on Estero Island. Also, a permit modification (DEP File No 0158893-008-BN) was issued 10 July 2009 to include activities within the advanced maintenance area. Finally, a major permit modification was submitted 4 June 2012 to include the remaining FMBH channel cuts 4-10 and the turning basin in this JCP.

In accordance with Section 7 of the Endangered Species Act of 1973 (ESA), consultation with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) has been completed (see section 5.2 on pages 48-49).

1.8 SCOPING AND ISSUES

1.8.1 ISSUES EVALUATED IN DETAIL

The following issues were identified to be relevant to the proposed action and appropriate for detailed evaluation:

a. Water Quality
b. Sediment Compatibility
c. Fish and Wildlife, including Endangered Species and Critical Habitat
d. Essential Fish Habitat (EFH)
e. Cultural Resources
f. Aesthetics
g. Navigation
h. Economics
i. Recreation
j. Noise

2 ALTERNATIVES

The alternatives section is perhaps the most important component of this 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 decisionmaker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Probable Impacts.

2.1 DESCRIPTION OF ALTERNATIVES.

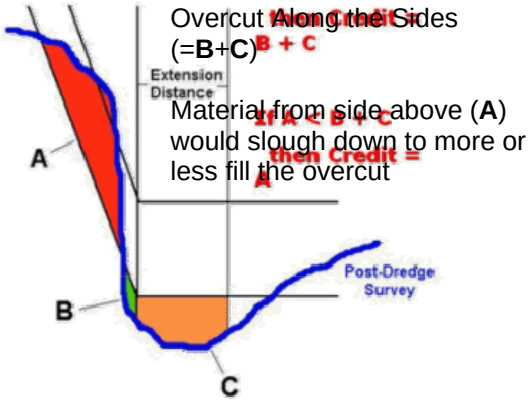
2.1.1 NO ACTION ALTERNATIVE

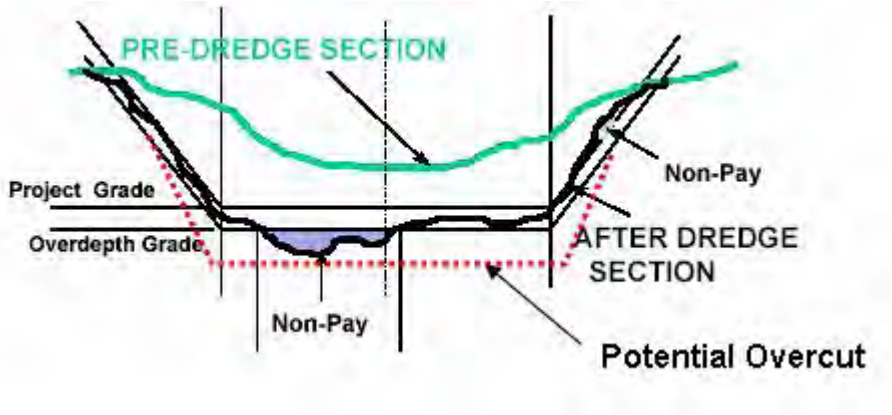
The project channels would not be maintenance dredged. This would result in increased shoaling and unsafe navigation conditions for vessels. In addition, the down-drift critically eroded beaches would not receive inlet bypassed sediments.

2.1.2 MAINTENANCE DREDGING ALTERNATIVE

The proposed periodic maintenance dredging of the project channel would occur as planned (refer to Section 1.1 for more detail). The Corps does not normally specify the type of dredging equipment to be used. This is generally left to the dredging industry to offer the most appropriate and competitive equipment available at the time. Never-the-less, certain types of dredging equipment are normally considered more appropriate depending on the type of material, the depth of the channel, the depth of access to the disposal or placement site, the amount of material, the distance to the disposal or placement site, the wave-energy environment, etc. A more detailed description of types of dredging equipment and their characteristics can be found in Engineer Manual, EM 1110-2-5025, *Engineering and Design - Dredging and Dredged Material Disposal*. This Engineer Manual is available on the internet at http://www.usace.army.mil/publications/eng-manuals/em1110-2-5025/toc.htm.

The plans and specifications normally require dredging beyond the project depth or width. The purpose of the "required" additional dredging is to account for shoaling between dredging cycles (reduce frequency of dredging required to maintain the project depth for navigation). In addition, the dredging contractor is allowed to go beyond the required depth. This "allowable" accounts for the inherent variability and inaccuracy of the dredging equipment (normally ±2 feet).





In addition, the dredge operator may practice over-cutting. An "over-cut" along the sides of the channel may be employed in anticipation of movement of material down the sides of the channel. Over-cut throughout the channel bottom may be the result of furrowing or pitting by the dredging equipment (the suction dredge's cutterhead, the hopper dredge's drag arms, or the clam-shell dredge's bucket). In addition, some mixing and churning of material below the channel bottom may occur (especially with a large cutterhead). Generally, the larger the equipment, the greater the potential for over-cut and mixing of material below the "allowable" channel bottom. Some of this material may become mixed-in with the dredged material. If the characteristics of the material in the overcut and mixing profile differ from that above it, the character of the dredged material may be altered. The quantity and/or quality of material for disposal or placement may be substantially changed depending on the extent of over-depth and over-cut.

Frequent maintenance dredging operations in the project channel have taken place since they were originally constructed to the authorized project depths. The most recent maintenance event in 2009 removed approximately 230,000 cubic yards (cy) of material from the project channel and placed this material in the nearshore placement area. Dredging of the project channels has been typically performed with a hydraulic cutterhead pipeline dredge although a clamshell or small hopper dredge could also perform the work.

Since dredging equipment does not typically result in a perfectly smooth and even channel bottom (see discussion above); a drag bar, chain, or other item may be drug along the channel bottom to smooth down high spots and fill in low spots. This finishing technique also reduces the need for additional dredging to remove any high spots that may have been missed by the dredging equipment. It may be more cost effective to use a drag bar or other leveling device.

2.1.3 DREDGED MATERIAL PLACEMENT OPTIONS

2.1.3.1 BEACH PLACEMENT

Beach placement — placing on the beach dredged material compatible with the native beach sands — is an approach to dredged material management that the State of Florida encourages. In fact, the DEP BBCS Strategic Beach Management Plan for the Southwest Gulf Coast Region (May 2008) recommend the continued placement of beach quality dredged material from the maintenance of the project channel on the beach on Estero Island. The Corps also includes this approach as an essential part of dredged material management for channel reaches which, based on historic data, are likely to contain beach quality sediments. These conditions are most

typically encountered immediately adjacent to tidal inlets where waterway shoals are formed primarily by sand driven through the inlet by waves and tides. The material historically dredged here has been beach quality in compliance with the Florida State sand rule and the beaches along Estero Island are designated by DEP as critically eroded. Thus dredged material from the project channels has been routinely placed on the beach south of the inlet.

2.1.3.2 NEARSHORE PLACEMENT

Material that does not qualify for beach placement would be placed adjacent to the beach area in the nearshore between DEP monuments R-182 to R-187 (Figure 1). This site is located from 200 feet to 700 feet offshore; the dimensions are 5000 feet by 500 feet, **Figure 2**. Depth of the placement would be from -4 feet to -6 feet, with none higher than -2.5 feet at the MLLW line. Pursuant to subsection 62B-41.005(15), Florida Administrative Code (the "Florida State sand rule"), sandy sediment derived from the maintenance of coastal navigation channels shall be deemed suitable for beach placement with up to 10 percent fine material passing the #230 sieve. If this material contains between 10 percent and 20 percent fine material passing the #230 sieve by weight, and it meets all other sediment and water quality standards, it shall be considered suitable for placement in the nearshore portion of the beach. Therefore, this placement alternative would be used if the dredged material were deemed incompatible for beach placement but in compliance with the sand rule for nearshore placement.

2.2 HISTORY OF ALTERNATIVE FORMULATION

Maintenance dredging of the Federal navigation channel within FMBH Pass has been required frequently between 1960 to the most recent event of 2009. Beneficial use of the beach quality dredged material has been the preferred and most cost effective dredged material placement alternative, although previous events have also used the nearshore placement area that is present some 500-feet offshore the beach placement area. Given the available dredged material placement options and the Federal mandate to maintain free and obstructed access to the nation's navigational waters, as well as the high cost of ocean dredged material disposal sites (ODMDS), other dredging and placement alternatives were not considered practicable.

2.3 ALTERNATIVES COMPARISON

The effects of alternatives considered for this project are compared and summarized in **Table 1**. This comparison lists the major features and consequences of the emergency action and alternatives. See Section 4.0, starting on page 38, for a more detailed discussion of the potential impacts of each alternative.

Table 2. Alternative Comparison Chart.

ENVIRONMENTAL FACTOR	ALTERNATIVE 1: NO ACTION STATUS QUO	ALTERNATIVE 2: DREDGING WITH BEACH PLACEMENT	ALTERNATIVE 3: DREDGING WITH NEARSHORE PLACEMENT
WATER QUALITY	No Impact	Short-term localized increase in turbidity at the dredge site and in surf zone along the beach placement area. Turbidity impacts are expected to be minimal since the source of material would contain less than 10% fines.	Short-term localized increase in turbidity at the dredge site and in surf zone along the nearshore placement area. Turbidity impacts are expected to be minimal since the source of material contains less than 20% fines.
WEST INDIAN MANATEE	Manatees could become injured through collision or trapped by vessels passing overhead from inadequate clearance between the channel bottom and vessel.	Dredging and beach placement not likely to adversely affect manatees with implementation of standard protection conditions. Increased boat traffic from restored navigability but reduced travel time and distance in shallow inland waters.	Dredging and nearshore placement is unlikely to adversely affect manatees with implementation of standard protection conditions. Increased boat traffic from restored navigability but reduced travel time and distance in shallow inland waters.
SEA TURTLES	No dredging means no maintenance material to place on the critically eroded nesting beach.	Short-term impacts to sea turtle nesting during beach placement through relocation of nests from the project area; Gain of sea turtle nesting habitat from beach placement on this critically eroded beach.	Short-term impacts to nesting sea turtles during nearshore placement; Benefit to sea turtle nesting habitat from shoreward migration of the dredged material.
SMALLTOOTH SAWFISH	No effect.	No adverse effects are anticipated with implementation of standard sea turtle and smalltooth sawfish protective measures for in-water work during dredging and beach placement.	No adverse effects are anticipated with implementation of standard sea turtle and smalltooth sawfish protective measures for in-water work during dredging and nearshore placement.
ESSENTIAL FISH HABITAT	Continued accretion in channel and water column displaces EFH.	No substantial adverse impacts to sandy channel bottom, water column, or ocean high salinity surf zone habitat anticipated during dredging and beach placement.	No substantial adverse impacts to sandy channel bottom, water column and ocean high salinity surf zone habitat with unconsolidated substrate during dredging and nearshore placement.
PIPING PLOVER	Monitoring since the dredging in 2009 has shown no long-term net loss of habitat from dredging so not dredging channel should have negligible effect.	Alteration, but no net loss, of critical habitat is anticipated due to dredging based on long-term shoreline change monitoring; beach placement should augment critical habitat through littoral drift (see section 4.7.2.3).	Alteration, but no net loss, of critical habitat is anticipated due to dredging based on long-term shoreline change monitoring; nearshore placement should augment critical habitat through littoral drift. (***Over the first year of monitoring, sedimentologic results indicate dispersion of finer sediments downdrift and offshore of the natural bar over the control area. Results indicate that the project design was successful in that sand-sized sediments are migrating onshore and finer sediments are moving offshore)*** ERDC/CHL CHETN-XIV-10 January 2012

ENVIRONMENTAL FACTOR	ALTERNATIVE 1: NO ACTION STATUS QUO	ALTERNATIVE 2: DREDGING WITH BEACH PLACEMENT	ALTERNATIVE 3: DREDGING WITH NEARSHORE PLACEMENT
MIGRATORY BIRDS	Monitoring since the dredging in 2009 has shown no long-term net loss of habitat from dredging so not dredging channel should have negligible effect (see section 4.6).	If dredging and beach placement occur during the nesting season (approximately April 1 – August 31) a migratory bird protection plan would be implemented to insure protection of nests.	If dredging occurs during the nesting season (approximately April 1 – August 31) a migratory bird protection plan would be implemented to insure protection of nests.
VEGETATION	No effect.	Potential impact during dredging through removal of beach vegetation colonizing upland accreted shoal material in the channel footprint; beach placement would occur seaward of any existing beach vegetation.	Potential impact during dredging through removal of beach vegetation colonizing upland accreted shoal material in the channel footprint; nearshore placement would have no impact to beach vegetation.
HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW)	No effect.	No effect anticipated; channel has been dredged frequently since 1960 and material placed on the beach with no impact to or from HTRW.	No effect anticipated; channel has been dredged frequently since 1960 and material placed on the beach with no impact to or from HTRW.
NAVIGATION	Continued shoaling in the Federal channel would have a significant adverse impact on navigational safety.	Dredge barge and pipelines could temporarily alter navigation patterns during construction; However, authorized channel depths would be restored which is a lasting beneficial impact.	Dredge barge and pipelines could temporarily alter navigation patterns during construction; However, authorized channel depths would be restored which is a lasting beneficial impact.
ECONOMICS	Continued shoaling in the channel would have a significant adverse impact on recreational and commercial vessel traffic which would have a substantial impact on the local economy.	Restored authorized channel depths would benefit the local economy; beach placement could also benefit the local economy through increased beach tourism revenues.	Restored authorized channel depths would benefit the local economy; nearshore placement could also benefit the local economy through increased beach tourism revenues as the material is transported through littoral drift to augment the dry beach.
CULTURAL RESOURCES	No effect.	One known archeological site has been reported within the general vicinity of the beach placement area; Additional cultural resource surveys would be needed to complete effects determination prior to use of this area.	Six targets have been identified. Two within the pipeline route and four within the placement area. All will be buffered and therefore, no adverse effect anticipated.
RECREATION	Continued shoaling in the channel would have a significant adverse impact on recreational activities.	Temporary disturbance due to project dredge and beach placement activities; However, authorized channel depths would be restored and recreational beach increased through placement which are lasting beneficial impacts.	Temporary disturbance due to project dredge and nearshore placement activities; However, authorized channel depths would be restored and critically eroded recreational beach augmented through nearshore placement which are lasting beneficial impacts.

ENVIRONMENTAL FACTOR	ALTERNATIVE 1: NO ACTION STATUS QUO	ALTERNATIVE 2: DREDGING WITH BEACH PLACEMENT	ALTERNATIVE 3: DREDGING WITH NEARSHORE PLACEMENT
AESTHETICS	Shoaled in channel and eroded beach may negatively impact local aesthetic resources.	Dredging equipment would have a temporary impact on local aesthetics. However, restored navigation channel and beach should be beneficial to local aesthetics.	Dredging equipment would have a temporary impact on local aesthetics. However, restored navigation channel and nearshore berm could be beneficial to the local aesthetic resources.
NOISE	Grounding vessels and the rescue equipment required to free them could generate increased local noise levels as the channel shoals in and becomes impassable.	Dredging and placement equipment operations would temporarily increase the local noise levels; However, levels should return to normal at conclusion of project construction.	Dredging and placement equipment operations would temporarily increase the local noise levels. However, levels should return to normal at conclusion of project construction.

2.4 PREFERRED ALTERNATIVE

The preferred alternative is to perform the proposed maintenance dredging of the project channel in order to maintain the authorized dimensions. The nearshore is the preferred placement alternative due to the need for inlet sediment bypassing of nearshore quality dredged material to the critically eroded beach and due to the need to perform additional cultural resource investigations prior to using the beach placement area.

3 AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This section describes the existing environmental resources of the areas that would be affected if either of the alternatives is implemented. It 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 resources that could 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 impacts of the Preferred Alternative.

3.2 GENERAL ENVIRONMENTAL SETTING

The FMBH Federal navigation channel included within the project area is immediately adjacent to Bowditch Point Regional Park, a public park that is owned and maintained by Lee County. Due to storm activities from 2009 to the present, as well as the construction of a terminal groin structure at the north end of the beach placement area on Estero Island, accreted material at the terminus of the point has created a sandbar obstruction within the authorized Federal channel, see **Figure 3**. The shoreline consists of a gradually sloping beach that extends from an upland dune to the intertidal swash zone. Exposed fine sand and silt extend into the designated Federal channel at MLLW. Wrack material includes remnant *Sargassum* and other macro-algal detritus line the swash zone at the mean high tide line. This area supports moderate to high potential piping plover suitable habitat.

Bowditch Point is a peninsula at the north end of Estero Island that curves around the north and south side, see **Figure 1**. A long beach is present facing the Gulf of Mexico along the southside of the island. However, on the north side from the point facing Estero Bay, the beach diminishes and estuarine vegetation including red mangrove (*Rhizophora mangle)* extends into the watered shoreline. Small, narrow beaches reach further down this shoreline along the project area. The Federal channel turns to parallel this coastline along the Estero Bay side and this segment of the channel is included in the project area for this EA. Recent geotechnical sampling and analysis has indicated that this channel material may be compatible with beach and nearshore placement.

Figure 3. Bowditch Point after construction of the terminal groin and beach re-nourishment project, Lee County September 2011 (Note the intertidal pools to the left and right of the point, creation of additional beach, and extension of suitable piping plover habitat toward the northeast corner of the point).

3.3 ENVIRONMENTAL FACTORS THAT WOULD BE AFFECTED

3.3.1 PHYSICAL

The San Carlos Bay watershed, including the lower drainage area of the Caloosahatchee River, encompasses approximately 231,638 acres. Based on 1990 data (CHNEP 1999), the largest land use in the watershed is urban (33%), followed by agriculture (21%). The most significant projected changes in future land uses are identified as a large increase (80%) in urban area and a large decrease (74%) in wetland areas (CHEVWQMN, 2007). A small portion of the estuarine shoreline is in preservation and is managed by the Charlotte Harbor Preserves State Park, including "Ding" Darling National Wildlife Refuge and the nonprofit Calusa Land Trust.

3.3.2 WATER QUALITY

The FMBH channel is located outside of both the Estero Bay Aquatic Preserve as well as a designated Outstanding Florida Waters, as shown on **Figure 4**. The Federal Clean Waters Act requires that the surface water of each state be classified in accordance with designated uses.

The project site is located within a Class III surface water quality (Chapter 62-302, F.A.C.), which is designated for general use of recreation including swimming.

San Carlos Bay, which contains the project area, is not within a designated aquatic preserve, but connects directly to the Estero Bay Aquatic Preserve. It is located at the mouth of the Caloosahatchee River, its primary tributary. Water quality data for Carlos Bay was collected and analyzed from 1998 to 2005 by the DEP, Charlotte Harbor Aquatic Preserves office. According to the final report (CHEVWQMN 2007) San Carlos Bay had above average water quality and ranked as having the highest water quality of all estuary regions in the Charlotte Harbor study area. Total nitrogen was average compared to Florida's estuaries, with total nitrogen and total Kjeldahl nitrogen (TKN) median values ranking second across all estuaries within the Charlotte Harbor region. The median value for chlorophyll *a*, an indicator of an Impaired Surface Water under Florida Rule (62.303.3653 F.A.C.), was lower than the average value for Florida's estuaries and was the lowest concentration of all estuary regions in the study area. No site within San Carlos Bay demonstrated chlorophyll *a* mean annual value exceeding the state criteria of 11μg/L (micrograms per liter). San Carlos Bay tied for the lowest median fecal coliform bacteria concentrations across all estuary regions in the Charlotte Harbor study area. The dissolved oxygen (DO) and color values significantly increased over the study duration, while salinity, temperature and turbidity levels significantly decreased. Overall, surface waters within San Carlos Bay are potentially impaired in accordance with Impaired Surface Water Rule.

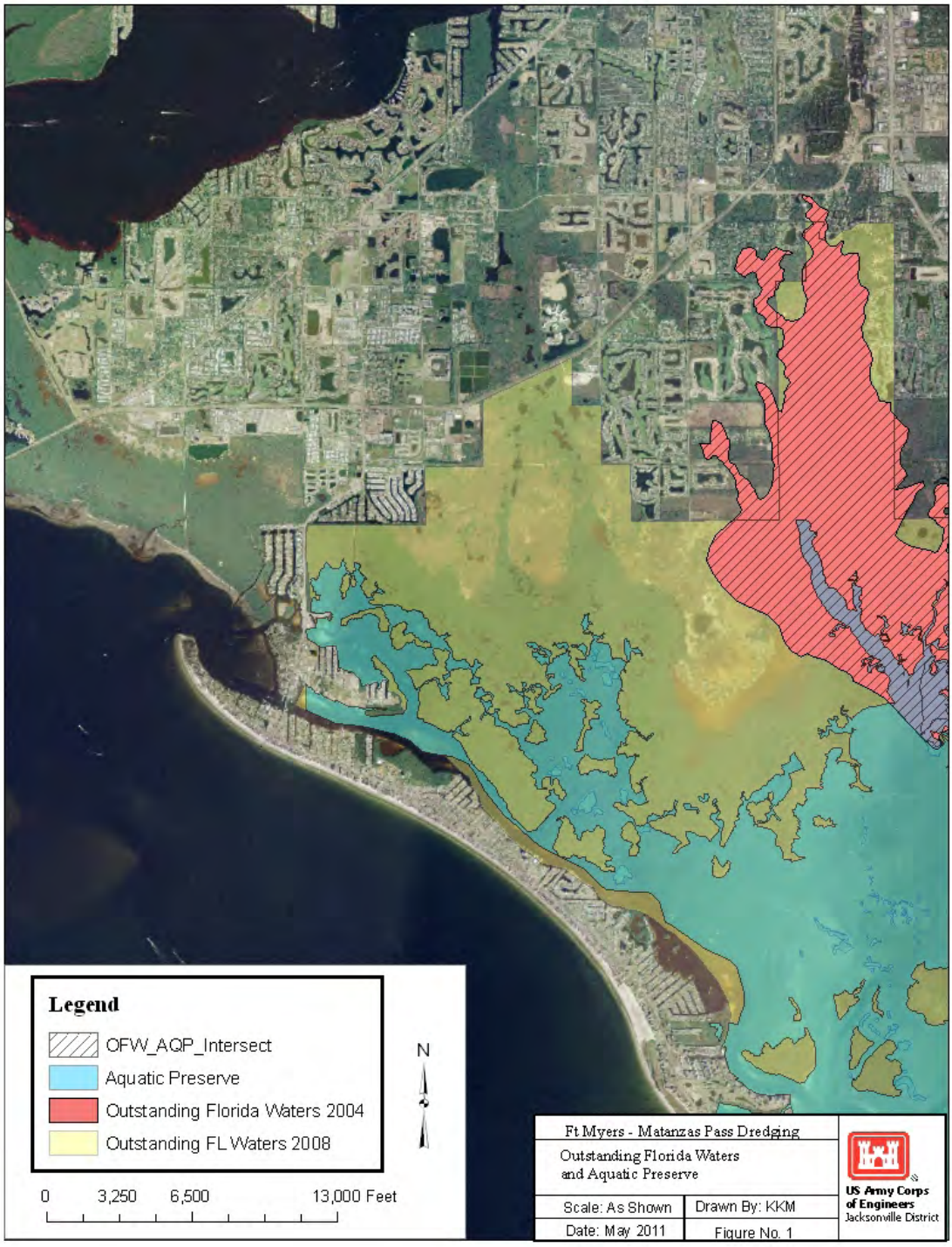


Figure 4. Map of Florida Outstanding Waters and Estero Bay Aquatic Preserve, Lee County.

Turbidity measures the amount of suspended particulate matter within the water column including both organic and inorganic material. Increased turbidity in estuaries can be a result of estuarine bottom sediments from wind and wave action, storm water runoff from the watershed, erosion and others. Excessive turbidity in estuaries has a variety of physical and biological effects, including decreased light availability for seagrass. Florida Surface Water Quality Standards state that turbidity shall never exceed 29 NTU above natural background conditions.

Turbidity values within San Carlos Bay are considered generally average (median value of 3.2 NTU). In the shallow estuary of Estero Bay, the values were higher than average (median value of 4.2 NTU) to when compared to other estuaries across the state of Florida. This is most likely due to wind and wave action that may contribute to re-suspension of bottom sediments. Data gathered from the Aquatic Preserves Water Quality Status & Trends for 1998 – 2005 (CHEVWQMN Final Report, Sept 11, 2007) for the Caloosahatchee River outflow into San Carlos Bay is in **Table 3** presented below:

Table 3. Turbidity data from 2005 – 2007.

San Carlos Bay within the Caloosahatchee River Watershed

Turbidity (NTU)	N	Min	Max	Mean	SE	Median	Rank	% TFE	Status TFE
	294	0.5	120.0	4.2	0.4	3.2	8	50	average

TFE = Typical Florida Estuary
N = Number of Occurrences
SE = Standard of Error

Water quality conditions in the San Carlos Bay estuary are strongly influenced by variability in freshwater flow via the Caloosahatchee River and subsequent changes within the Caloosahatchee watershed. A better understanding of the effects of changes in hydrologic regimes and watershed land uses is essential for sustaining and restoring the productive submerged habitats of San Carlos Bay, including seagrass meadows, shellfish communities and fisheries populations.

3.3.3 SEDIMENT ANALYSIS

Geotechnical data was collected in 2011 from within FMBH Cuts 1 through 10, the wideners and the turning basin. This geotechnical data was used in conjunction with historical borings and background knowledge of the project to characterize the material within the areas to be dredged.

The materials that have historically accumulated within the FMBH channel, wideners and turning basin typically have met the FDEP "Sand Rule" F.A.C. 62B-41.007(j)(k) criteria for nearshore placement. Specifically, sediments derived from the maintenance of coastal navigation channels which contain between 10 and 20 percent fine material passing the #230 sieve by weight are considered suitable for placement in the nearshore portion of the coastal system.

Historically the materials that have shoaled in Cut 1 consist of poorly graded, fine to medium grained sand sized quartz with few to some silt interbedded with silt layers. Silt content ranges from trace (1% passing the #230 sieve) to discrete layers of silt (60% passing the #230 sieve). Additionally, visual shell content varying from 0-35% is present. The materials vary in color from light gray to very dark gray. Historically, material near Bowditch Point and the junction of Cut 1 and Cut 2A has been fine to medium grained sand sized quartz with trace silt and shell content and light gray in color. It is anticipated that this material (near Bowditch Point and the junction of Cut 1 and Cut 2A) would be suitable for beach placement (containing up to 10 percent fine material passing the #230 sieve).

Coarser material is expected to shoal in Cut 1 in the future due to altered hydrodynamics from the construction of a terminal groin on the northern end of Estero Island adjacent to the federal channel which is designed to trap migrating beach sand.

Shoal material from Cuts 2 through 9 and the wideners is predominately slightly silty, poorly graded, very fine to medium sand sized quartz. Silt content ranges from trace (1% passing the #230 sieve) to little silt (14% passing the #230 sieve). Additionally, visual shell content varying from 0-45% is present except in Cut 6 where surficial samples show 80% mostly sand to fine gravel sized flat shell. Shoal materials in Cuts 2 through 9 and the wideners vary in color from white to greenish gray.

Finally, the shoal material in Cut 10 and the turning basin is predominately silty to slightly silty, poorly graded, very fine to medium sand sized quartz. Silt contents range from trace (1% passing the #230 sieve) to little silt (21% passing the #230 sieve) above the maximum dredge depth. Additionally, visual shell content varying from 0-50% is present and the material varies in color from light gray to black.

3.3.4 BIOLOGICAL RESOURCES

The presence of wildlife in the area is geographically limited and dependent on human interaction and vegetative cover. Vegetation along the shoreline of the federal channel and placement sites contain various small but distinct plant communities such as tidal swamp, coastal grassland, beach dune, and coastal berm (Bowditch Point Regional Park, Lee County, Land Stewardship Section, 2008).

3.3.4.1 Vegetation

Vegetation above the immediate beach consists of typical upland dune species such as seagrape (*Coccoloba uvifera*), sea oats (*Uniola panicualta),* saltgrass (*Distichlis spicata),* bushy seaside ox-eye *(Borrichia frutescens),* and railroad vine, (*Ipomoea pes-careae)*. Shrubs located at the upper elevation along the dune top include saltbush (*Bachharis halimifolia)*, live oak saplings (*Quercus virginiana)*, and a few invasive Brazilian pepper (*Schinus terebinthifolius)*. With the recent accretion of sand into the area of Federal channel, a dominant saltgrass meadow has naturally recruited to form a primary succession plant community, see **Figure 5**. Exposed beach extends from the edge of the meadow into the swash zone at the shoreline.

Figure 5. Bowditch Point within the federally authorized FMBH in 2008, prior to the emergency maintenance. Note the saltgrass meadow that has become established on accreted material.

3.3.5 WILDLIFE RESOURCES

Migrant species from surrounding areas such as raccoon (*Procyon lotor)*, eastern gray squirrel (*Sciurus carolinensis)*, and other small mammals may appear in the project area or general vicinity. Dolphins (*Tursiops truncates)*, porpoise and manatees may inhabit the nearby waters. Birdlife is abundant and it is estimated that about 30 species of waterfowl consisting of grebes (*Podilymbus podiceps)*, brown pelicans, (*Pelecanus occidentalis)*, double-crested cormorants (*Phalacrocorax auritus)*, frigatebirds (*Fregata magnificens)*, and white ibis (*Eudocimus albus)*, as well as various egrets, herons, gulls, and ducks may occur in the project area region, especially around the inlet. Songbirds frequenting the area include various kingfishers, swallows, crows, wrens, warblers, and sparrows. Many sport and commercial species of fish are also common to the region. Additionally, a healthy gopher tortoise (*Gopherus polyphemus)* colony is located within Bowditch Point Regional Park, adjacent to the project area.

3.3.5.1 Marine Mammals

San Carlos Bay, including the project area, is within the range of the Florida sub-species of the West Indian manatee (*Trichechus manatus latirostris*) and up to 28 cetacean species, with bottlenose dolphin (*Tursiops truncates)* being most common.

Bottlenose dolphins have robust bodies that typically reach 6 to 12 feet as adults. They feed on fish such as mullet and sheepshead, along with marine invertebrates. The live up to 50+ years, and have weights between 140 kilograms and 650 kilograms. Bottlenose dolphins frequent both inshore and offshore marine waters along temperate and tropical coasts. Inshore dolphins live in small social groups, or pods, of up to 10 individuals, and are frequently sighted in San Carlos and Estero Bay at the Matanzas Pass inlet. They are highly intelligent and have complex socialization and communication skills. Dolphins along the coast of Florida are protected by Federal law against harassment under the Marine Mammal Protection Act (MMPA) of 1972. (FWC, NMFS, website factsheets).

3.3.5.2 Migratory Birds

Various shorebirds occur in the project area. As of 2006, a total of 23 species of wading and shorebirds are associated with marine habitats in the Bowditch Point area. Of these 23 species only three species, which include piping plover, dunlin and Wilson's plover, were observed to have extensive foraging within this region (USACE ERDC, 2009). Other species that moderately forage in this region include snowy plover and semipalmated plover, among others. Twelve species routinely roost in this area, which also include red knot, piping plover, Wilson's plover and snowy plover (USACE ERDC, 2009). Due to human disturbance, such as uncontrolled pets, all-terrain vehicles (ATV) and other recreational usage on the beach, sightings of piping plover and snowy plover have diminished more recently. Areas where shorebirds most frequently occur include the intertidal area of the swash zone along fresh wrack line.

Additionally, Bowditch Point is also a USFWS designated critical habitat area (Unit FL-25) for piping plover, a federally protected species under the Endangered Species Act (ESA); see **Figure 7**, Section 3.3.6.3, page 25. Rookery habitat for wading birds and the federally threatened wood stork are not present at Bowditch Point, but are present across San Carlos Bay at Bunche Beach.

The following avian species are suspected to utilize, or known to occur in the project area:

Black Skimmer (*Rynchops niger*)
Brown Pelican (*Pelecanus occidentalis*)
Double-crested Cormorant (*Phalacrocorax auritus*)
Great Blue Heron (*Ardea herodias*)
Great Egret (*Casmerodius albus*)
Laughing Gull (*Larus atricilla*)
Osprey (*Pandion haliaetus*)
*Piping Plover (*Charadrius melodus*)
Royal Tern (*Thalasseus maxima*)
Ruddy Turnstone (*Ironware interpret*)
Sandwich Tern (*Sterna sandricensis*)
Snowy Egret (*Egretta thula*)
White Ibis (*Eudocimus albus*)
Willet (*Catoptrophorus semipalmatus*)
Snowy Plover (*Charadrius alexandrines)*
Dunlin (*Calidris alpina)*

Wilson's Plover (*Charadrius wilsonia)*
Black-bellied Plover (*Pluvialis squatarola)*
Semipalmated Plover (*Charadrius semipalmatus)*
Short-billed Dowitcher (*Limnodromus griseus)*
Western Sandpiper (*Calidris mauri)*
Sanderling (*Calidris alba)*
Ruddy Turnstone (*Arenaria interpres)*
*Wood stork (*Mycteria Americana)*

* Denotes federally protected species under the ESA

3.3.6 THREATENED AND ENDANGERED SPECIES

Federally listed species under the Endangered Species Act of 1973 (ESA) that may occur in the area are discussed in the following sections**.** The gopher tortoise, although a state listed species, is also under consideration for protective status listing under the ESA, and is discussed in Section 3.3.6.4, page 26. The State listed species of special concern include the osprey, least tern, and great white heron.

3.3.6.1 Manatee

The West Indian manatee (*Trichechus manatus*) has been listed as a protected mammal in Florida since 1893. The manatee is also federally protected under the Marine Mammal Protection Act of 1972 (MMPA) as a depleted species. The manatee was listed as an endangered species throughout its range in 1967 (32 FR 4061) and received federal protection with the passage of the ESA in 1973. Although critical habitat was designated in 1976 for the Florida subspecies (*Trichechus manatus latirostris*) (50 CFR 19.95(a)), there is no federally designated critical habitat in the project's impact area. Florida provided further protection in 1978 by passing the Florida Marine Sanctuary Act designating the state as a manatee sanctuary and providing signage and speed zones in Florida's waterways.

Manatees reside and feed mainly in the estuarine areas and around inlets, and are only occasionally observed in the open ocean. The seagrass colonies established in San Carlos Bay adjacent to the project area provide a transitional travel corridor and foraging habitat for the species. According to the Protected Species Sightings Summary Report, (ECOES Consulting Inc, 2009), sightings of up to twenty (20) manatees were recorded regularly during the course of the dredging operation from May 24 to July 16, 2009. Operation shutdown was implemented during each manatee incursion into the exclusion zone and was lifted once the manatees were observed outside the 50-foot radius surrounding the dredge.

Finally, although there are no warm water aggregation areas for manatees within the project area, FMBH channel Cuts 3-10 are included within the Estero Bay Important Manatee Area (IMA). These are areas where increased densities of manatees occur due to the proximity of freshwater discharges, natural springs, and other habitat features that are attractive to manatees. These areas are heavily utilized for resting, feeding, drinking, transiting, nursing, etc., as indicated by aerial survey data, mortality data, and telemetry data.

Figure 6. IMA Boundary.

3.3.6.2 Sea Turtles

Four species of sea turtles that are federally listed endangered or threatened under ESA utilize habitat within the project area as well as the adjacent nearshore and beach on Estero Island. These include the loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), leatherback sea turtle (*Dermochelys coriacea*), and Kemp' Ridley sea turtle *(Lepidochelys kempii)* (FWC/FWRI website). The loggerhead is listed as a federally threatened species, while the green sea turtle is listed as threatened, with the exception of breeding populations in Florida where they are listed as endangered. Both the Kemps ridley and leatherback sea turtles are listed as endangered under the ESA (USFWS website factsheets). The nesting season for all species of sea turtles, as defined by the FWC, is between March 1 and October 31 in Lee County.

Data from the Fish and Wildlife Research Institute (FWRI), the research arm of the FWC, determined that loggerhead, Kemps ridley, and green sea turtles have historically nested along the beach environment along Bowditch point south to Fort Myers Beach (FWRI, 2008). This area includes both the Federal channel (where material has accreted) and the dredged material beach placement site. Sea turtle stranding data from 2004 to 2007 indicate that the majority of sea turtles that utilize this beach for nesting are mostly loggerhead, followed by Kemp's ridley sea turtles, while very few green sea turtles have been shown to occur (FWRI, 2008). Sea turtle nesting data acquired for all of Lee County supports this view as 541 loggerheads nested along Lee County beaches in 2007, 865 loggerheads were present in 2008, and 754 loggerheads were present in 2009 (FWRI website data, 2010). In 2008, loggerhead sea turtle nests averaged 12 nests, or 4.5 nest per mile in the project area. For green sea turtles, nests averaged 0.11 nests per mile on the beaches of Lee County; however, no green sea turtle nests were found in 2008 within the project area (FWC 2009 data cited in USFWS BO, 2009, Appendix E). No known nests of Kemp's Ridley, leatherback, or hawksbill sea turtles have been documented as occurring within the project area at time of the emergency action (FWC, 2009 data cited in USFWS BO, 2009). In 2008, twelve (12) sea turtle nests were found in the project area with eight (8) non-nesting emergences within the project area (Haverfield, 2010, Appendix F).

3.3.6.3 Piping Plover

Piping plover have been observed on Estero Island in Lee County most recently as 2006, where 21 individuals were observed, which is an increase from the 9 individuals that were present on Fort Myers Beach in 2001 (USGS, 2009). However, leading up to this emergency maintenance event, no piping plover has been observed within the project area, consisting Federal channel or adjacent beach to the nearshore placement area, during the wintering migratory windows of 2007 or 2008.

The FMBH project area is within USFWS designated piping plover critical habitat Unit FL-25 (FR Vol 66, no 132 36106, July 10, 2001 Rules and Regulations); see **Figure 7**. A description of Unit FL-25 including Bunche Beach 187 ha (461 ac) in Lee County is as follows:

> This unit is mostly within a CARL Estero Bay acquisition project. Bunche Beach (also spelled Bunch) lies along San Carlos Bay on the mainland between Sanibel Island and Estero Island (Fort Myers Beach), extending east from the Sanibel Causeway past the end of John Morris Road to a canal serving a residential subdivision. **The unit also includes the western tip of Estero Island (Boditch Point, also spelled Bowditch Point), including Bowditch Regional Park, operated by Lee County and on the southwest side of the island facing the Gulf, the beach south nearly to the northwesterly intersection of Estero Boulevard and Carlos Circle. It includes land from MLLW to where dense structures, not used by the piping plover, begin and where the constituent elements no longer occur or, along the developed portion of Estero Island.**

Also within Critical Habitat Unit FL-25 is the southern end of Estero Island, which is several miles away from both the FMBH and the dredged material placement sites along Fort Myers

Beach, as well as a portion of Bunche Beach Preserve across San Carlos Bay to the north. A map showing the extent of the Unit FL-25 is presented in **Figure 7**.

The USFWS has identified designated critical habitat units for the wintering population of piping plover through a description of known physical and biological features referred to as Primary Constituent Elements (PCE's), which are essential to piping plover conservation during the winter migration season. All areas proposed as critical habitat for the wintering population of the piping plover are occupied, and/or are within the species' historic geographical range containing sufficient PCE's to support at least one life history function, i.e. foraging and/or roosting.

Figure 7. USFWS Designated Critical Habitat for Wintering Population of Piping Plover Unit FL-25.

The PCE's of wintering piping plover habitat include sand and/or mud flats with no or very sparse emergent vegetation. In some cases, these flats may be covered or partially covered by a

mat of blue-green algae. Adjacent non-vegetated sand, mud, or algal flats above high tide are also essential, especially for roosting piping plovers. Such sites may have debris, detritus (decaying organic matter), or micro-topographic relief (less than 50 cm above the substrate surface) offering refuge from high winds and cold weather. Essential components of the beach/dune ecosystem include:

- surf-cast algae for foraging of prey, sparsely vegetated backreach (beach area above mean high tide seaward of the dune line, or where no dunes exist, seaward of a delineating feature such as a vegetation line, structure, or road) for roosting and refuge during storms;

- spits (a small point of land, preferably consisting of sand, running into water) for feeding and roosting;

- salterns (bare sand flats in the center of the mangrove ecosystems typically found above mean high water and are only irregularly flushed with sea water) for feeding and roosting; and

- washover areas (broad, unvegetated zones with little or no topographic relief that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action) for feeding and roosting.

Several of these components (sparse vegetation having little or no topographic relief) are mimicked in artificial habitat types used less commonly by piping plovers, but nonetheless, are considered critical habitat (e.g. dredge spoil sites). Not all life history functions require all the PCE's; therefore, not all proposed critical habitat will contain all the PCE's. All proposed critical habitat areas have been determined (by the USFWS) to contain sufficient PCE's to provide for **one or more** of the life history functions of the wintering population of the piping plover.

In some cases, the PCE's exist as a result of ongoing Federal actions, such as channel maintenance and dredged material placement. As a result, ongoing Federal actions at the time of designation will be included in the baseline in any consultation subsequent to this designation.

The emergency maintenance action of 2009 prompted an expedited formal consultation under the ESA in February 2009; see Appendix E. The emergency formal consultation request stated the area affected would include 2.3 acre of critical habitat for wintering piping plover within designated Unit FL-25. The document noted that previous bird count surveys from 2006 to 2008 indicated sighting of piping plover during designated wintering months (from mid-July to April) have become rare due to heavy human use of the area.

The original critical habitat designation (cited above) was amended in 71 FR 33703 (2006) for selected coastal areas along the Gulf of Mexico and the Atlantic Ocean. This designation occurred after the last FMBH dredging event that was completed in 2001. The 2.5 acres of affected habitat by the 2009 emergency action was formed from accreted material since the 2001

dredging event and is now considered critical habitat, although at the time of designation this acreage did not exist. Discussion of the direct effects to piping plover and its critical habitat are presented in Section 4. 7. 2. 3, page 42.

3.3.6.4 Gopher Tortoise

Gopher tortoise (*Gopherus polyphemus)* are considered a candidate species for proposed listing on the ESA in eastern sections of the United States which includes the population in Florida. If this species achieves listing on ESA, it could be designated as either endangered or threatened, depending upon the level of imperilment the species is facing. Populations west of Mobile, AL are currently listed on the ESA as threatened (USFWS website).

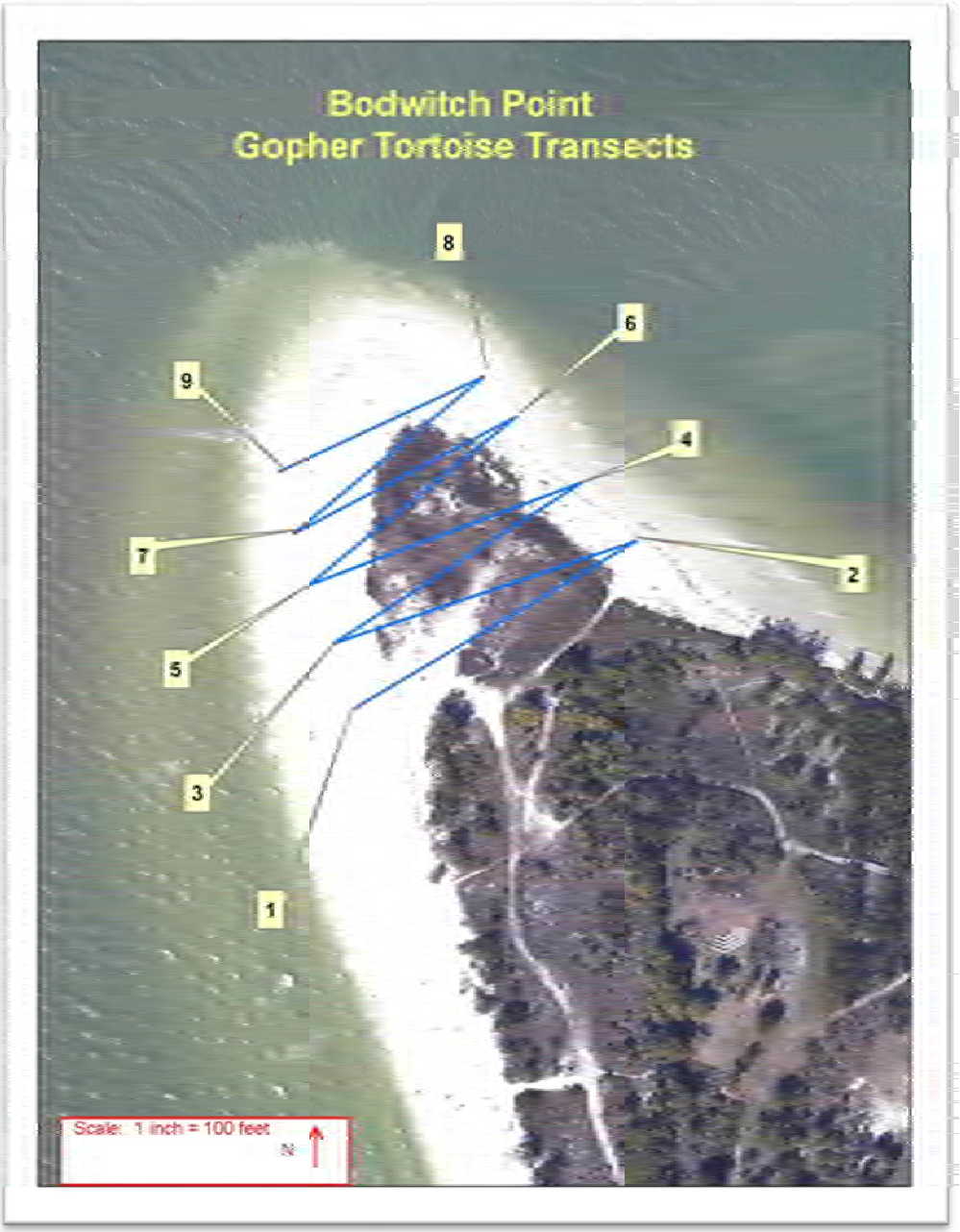
The upland restored scrub and grassland natural community of Bowditch Point provides a well known habitat for gopher tortoise (Lee County Land Stewardship Plan, 2008). A thriving colony of these animals is openly located within the perimeter of the park in this quality habitat, see **Figure 8**. According to local history, gopher tortoises were established at Bowditch Point from relocated tortoises due to property development on or off Estero Island. As of July 2007, there were at least eighteen borrows in the park. Of these, 9 burrows have been confirmed as active. Three of the new burrows are from tortoises that have been relocated to the site from Collier County. Most of the sites are located in the previously disturbed land area with two sites occurring in the coastal scrub (Lee County Land Stewardship Plan, 2008).

Figure 8. A gopher tortoise located at the entrance of its burrow within scrub habitat on Bowditch Point.

Note the abundance of wire grass (*Aristida stricta),* a desirable food source.

An on-site survey for gopher tortoise was conducted on May 12, 2009 prior to the emergency dredging activity. Transects bisected the project area in the zone of accretion in search for the presence of active and non-active burrows, see **Figure 9**. Of the nine transects that were surveyed, no active or inactive gopher tortoise burrows were sighted. The active burrows described above appear in the higher elevations of the park where natural plant communities are well-established.

Figure 9. Gopher tortoise transects locations of the survey conducted AT Bowditch Point prior to the emergency dredge event of 2009.



3.3.6.5 Smalltooth Sawfish

The smalltooth sawfish (*Pristis pectinata*) is currently listed as endangered under the ESA by NMFS (50 CFR 224). In 2003, it was the first marine fish species in U.S. waters added to the ESA listing (Ocean Conservancy 2009). Although smalltooth sawfish once ranged throughout U.S. coastal waters along the southeastern Atlantic and northern Gulf of Mexico, its known primary range is now reduced to the coastal waters near Everglades National Park and the Charlotte Harbor Estuary in extreme southern Florida. Sightings are very rare, although a local Cape Coral resident spotted a small (5-foot) juvenile in a canal as recently as February, 2011 (North Ft Myers Neighbor 2011). The designated critical habitat map for this species overlaps a portion of the Federal channel (**Figure 10**).

Scientists with the University of Florida have concluded that the sawfish population has declined by as much as 99% over the past 30 years and is in danger of extinction (Ocean Conservancy fact sheet 2009). The primary contributor for the decline of the smalltooth sawfish population has been bycatch from commercial and recreational fisheries. Other threats include entanglement in fishing lines, degraded water quality, reduction of critical habitat, disturbance by divers, and removal of their "saws" (NMFS 2009).

Smalltooth sawfish typically inhabit shallow waters (depths up to 20 feet) near the mouths of rivers in estuarine lagoons over sandy or muddy substrates; likewise, they may also be found in deeper waters (greater than 50 feet) along continental shelf (Carlson et al, 2006). Shallow coastal waters, such as bays and estuaries having depths less than 4 feet, provide an important nursery area for juvenile smalltooth sawfish (Carlson et al, 2006). The only breeding areas still known to exist are located in southwest Florida. Historically, Charlotte Harbor through Dry Tortugas has always harbored the largest numbers of smallthooth sawfish, along with the Ten Thousand Islands of the Everglades (Carlson et al, 2006). These areas serve as the last stronghold for the species. Maintenance and protection of habitat is an important component of the smalltooth sawfish recovery plan (NMFS 2009). Key habitat features, especially for juvenile individuals, consist of shallow, warm water with proximity to mangroves and estuarine conditions.

Similar to sharks and rays, smalltooth sawfish belong to a group of fish known as elasmobranches, as their skeletons are composed of cartilage, and are considered modified rays having a body shape and gill slits also found on sharks (NMFS 2009). They are long-lived, and slow to mature (up to 10 years). Adults can grow to be quite large; the longest recorded length is 24.7 feet, although the average length is around 18 feet (FLMNH website 2012). Females bear live young after about one year of gestation, and the litters reportedly range from 15 to 20 pups which are born during the warmer summer months in shallow, protected waters (FLMNH 2012). Their diet consists of macroinvertebrates, crustaceans, and fishes such as herrings and mullets. The saw is used to disturb surficial sediments in search of benthic invertebrates or to impale prey fishes on the rostral teeth (FLMNH 2012).

The Gulf of Mexico Regional Biological Opinion (GRBO), amended 19 November 2003 determined that "because there has never been a reported take of a small tooth sawfish by a hopper dredge, such take is unlikely to occur because of smalltooth sawfishes' affinity for

shallow, esturarine systems." The current GRBO, amended 9 January 2007, does not authorize any takes of the federally listed smalltooth sawfish.

3.3.7 SEAGRASS

As depicted in **Figure 11**, below, seagrass colonies are extensive in both San Carlos and Estero Bays. Although the FMBH Federal channel has been routinely maintained since 1959, seagrass colonies have successfully reestablished themselves along the channel edges both within and adjacent to a 50-foot buffer. The most recent 2009 emergency maintenance action did not encounter any seagrass colonies within Cuts 1and 2A of the 2.5 mile channel, nor in the advanced maintenance area.

Figure 10. Smalltooth Sawfish Critical Habitat Map.

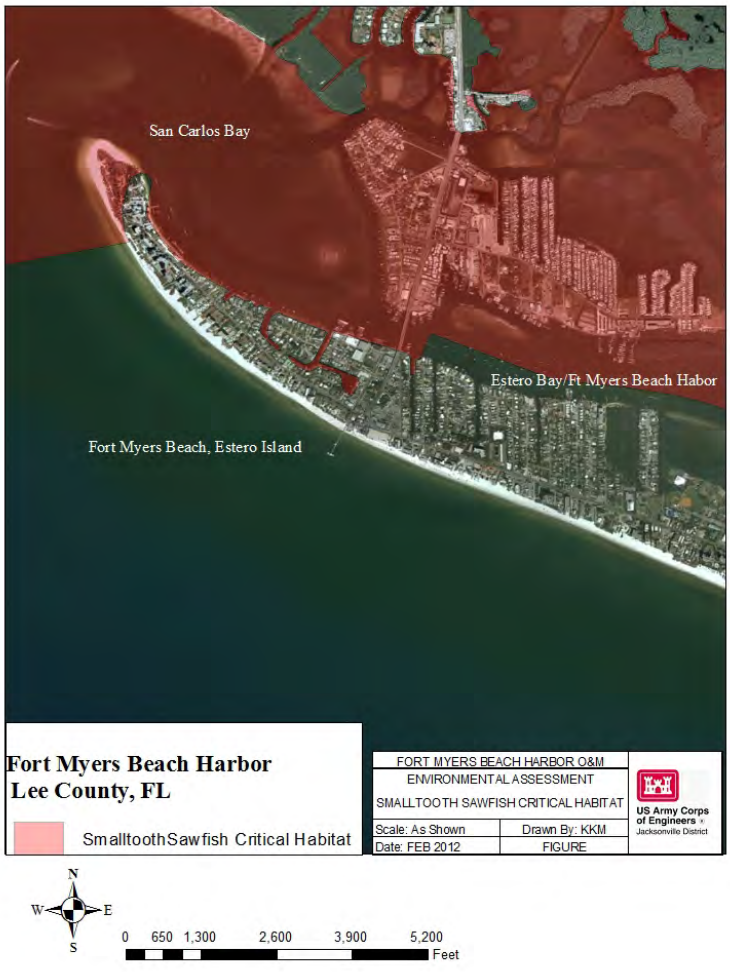
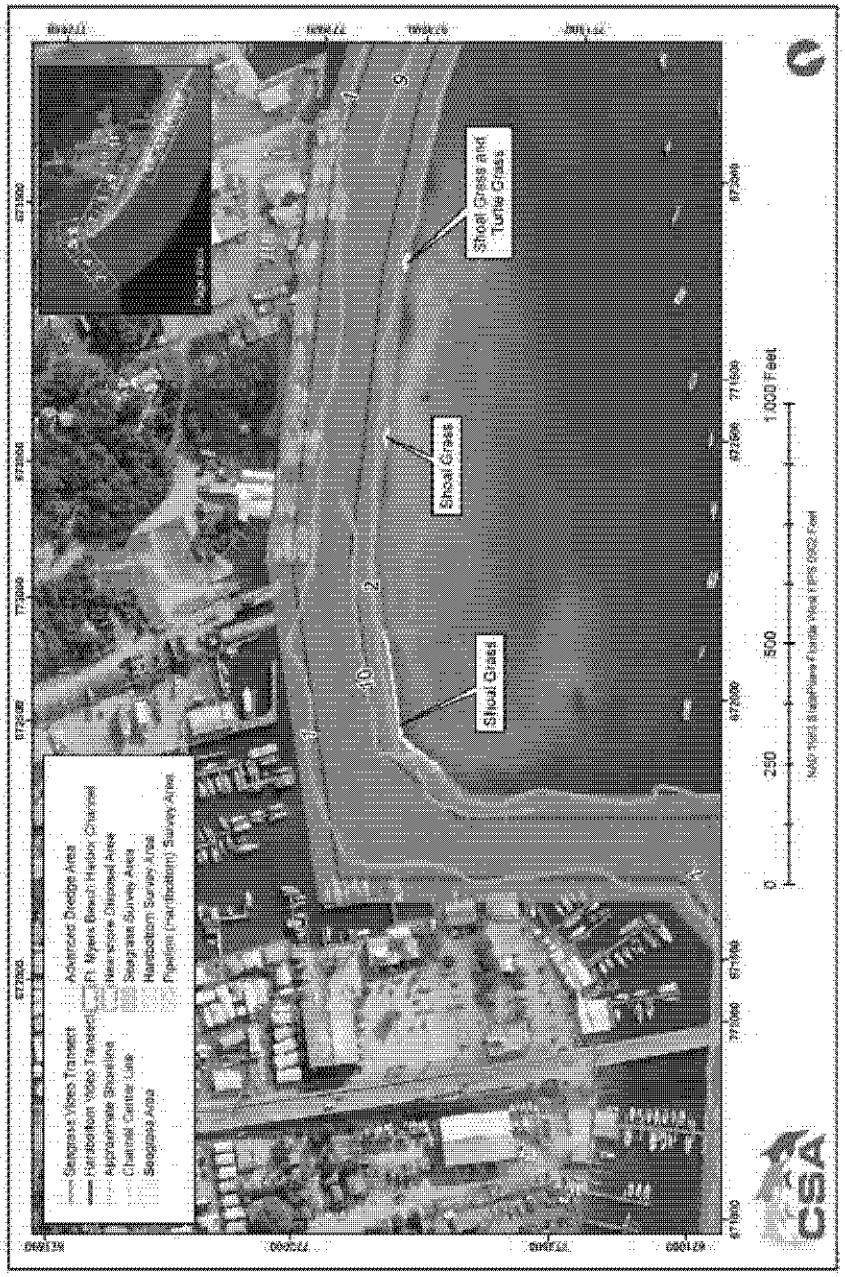


Figure 11. Seagrass colonies located in San Carlos and Estero Bay based on DEP data.

A project-specific survey for submerged aquatic natural resources within the project area was conducted by CSA International, Inc. during the summer of 2011. The study area includes all cuts along the entire Federal channel, the advanced maintenance area, the nearshore placement site, and the discharge pipeline corridor connecting the channel to the placement area. Field activities associated with the survey included towed video and diver survey by specialized staff and biologists in search of both hardbottom and seagrass beds. The underwater survey was conducted from 11 to 14 July, 2011. Visibility was poor at the time due to a beach renourishment and groin construction project conducted by Lee County. Depths were also shallow enough to enable observations to be conducted by snorkeling rather than SCUBA diving.

The results of the survey are presented in the report entitled *Final Seagrass and Hardbottom Survey*, (CSA, September, 2011) which determined several small colonies of seagrass beds occur adjacent to Cuts 8 and 9, as well as one minor location along the pipeline corridor, see **Figure 12**. The beds contain predominantly shoal grass (*Halophila wrightii)* with a minor amount of turtle grass (*Thalassia testudinum)* mixed with shoal grass in one location. These colonies are not within the Federal channel; rather, they are present on the outer-most edge of the 50-foot buffer study area where no dredging is proposed. According to the report, the total area of seagrass habitat within the 50-foot buffer zone covers an area of 2,216 sq feet (0.05 acre). Furthermore, no hardbottom resources were found to be present within the survey area.

Figure 12. Seagrass bed occurrences along edge of 50-foot buffer zone adjacent to Federal channel.



3.3.8 ESSENTIAL FISH HABITAT DESCRIPTION (EFH).

Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (16 U.S.C. 1801-1882) requires identification of habitats needed to support sustainable fisheries and comprehensive fishery management plans with habitat inclusions. The Act also requires preparation of an Essential Fish Habitat (EFH) assessment and coordination with NMFS when adverse impacts to EFH are likely to occur.

EFH is defined in the MSFCMA as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." For interpreting the definition of EFH, "waters" include aquatic areas and their associated physical, chemical, and biological properties used by fish, and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hardbottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle.

The Gulf of Mexico Fisheries Management Council (GMFMC, 1998) has designated non-vegetated bottom and water column zones within the project area as EFH in compliance with the MSFCMA. A summary of that assessment is included here. Managed species that commonly inhabit the project area are shown in **Table 4**.

Table 4. Managed species commonly occurring in the project area**.**

Common Name	**Scientific Name**
Stone Crab	*Menippe mercineria*
Spanish Mackerel	*Scomberomorus maculates*
Red Drum	*Sciaenops ocellatus*
Brown Shrimp	*Farfantepenaeus aztecus*
Pink Shrimp	*Penaeus duorarum*
White Shrimp	*Litopenaeus setiferus*

Source: Gulf of Mexico Fisheries Management Council 1999

The Gulf of Mexico in this region also provides essential forage, cover, and nursery habitats for other species that are important commercially and recreationally. These include the blue crab (*Callinectes sapidus*), flounder (*Syacium* sp.), and mullet (*Mugil* sp.), as well as prey species, such as the longspine porgy (*Stenotomus caprinus*) and dwarf goatfish (*Upeneus parvus*) (GMFMC 1998). A summary of managed species and their seasonal occurrence within the area is shown in **Table 5**.

Table 5. Species managed by the Gulf of Mexico Fishery Management Council**.**

Species	Seasonal Occurrence In Tampa Bay	Habitat Affinity
Pink Shrimp *(Penaeus duorarum)*	Adults- Rare from November-June Juvenile-Highly Abundant Year Round	Soft Bottom
Stone Crab *(Menippe mercineria)*	Common Year Round	Soft Bottom
Gag *(Mycteroperca microlepis)*	Juvenile- Year Round	Hard Bottom
Scamp *(Mycteroperca phenax)*	Year Round	Hard Bottom
Red Drum *(Sciaenops ocellatus)*	Adults-Common Year Round Juvenile-Common to Abundant Year Round	Soft Bottom
Spanish Mackerel *(Scomberomorus maculates)*	Adults-Common Year Round Juveniles-Rare Year Round	Water Column
Spiny Lobster *(Panulirus argus)*	Rare Year Round	Hard Bottom
Lane Snapper *(Lutianus synagris)*	Juvenile-Year Round	Hard Bottom
Yellowtail Snapper *(Ocyurus chrysurus)*	Juvenile-Year Round	Hard Bottom
Goliath Grouper *(Epinephelus itaiara)*	Juvenile-November to January	Hard Bottom

Source: Gulf of Mexico Fisheries Management Council 1999

3.3.9 CULTURAL RESOURCES

Lee County and Fort Myers

Lee County was formed out of Monroe County in 1887 and was named after the Confederate General Robert E. Lee. The time of its creation is reflective of the south's answer to reconstruction. The county seat is the City of Fort Myers. The city was established originally as a fort during the Seminole wars and was named after Colonel A. C. Myers. In 1858 the fort was abandoned but re-occupied during the Civil War by Union troops. The city slowly grew in the late 1880s and became an important destination for vacationers looking to escape the northern winter chills. One of its most famous visitors, Thomas Edison, liked the area so much that he stayed and brought down other famous people such as Henry Ford who bought property adjacent to Edison and his lab. By the late 1800s, the city with its famous Royal Palm Hotel was one of the largest tourist destinations in all of Florida. However, as Florida grew during the boom years in the early 1900s so too did it receive its share of the bust. Not until WWII with creation of military bases throughout Lee County did the area start to recover.

History of Bowditch Point Park

The park is named after Nathaniel Bowditch who perfected celestial navigation whereby sailors map their location on the globe by reference stars. The County purchased the 17.9 acre park in 1987 and updated the facilities in 2002. Prior to the creation of the park the parcel was a failed

development that sought to developed that remaining land on Fort Myers Beach. In 1944, very little of the park actually existed. The extension of the modern park is the result of piling of dredge spoil and natural sand accretion on the northern end of the island. The action of accretion is an ongoing process as the park frequently increases in size. Maintenance dredging frequently occurs to maintain this balance as the park inches closer over time to the Federal Channel that is situated just north of the park. The last time the channel had to be dredged due to this activity was 2009. Today the park has grown in size into the Federal Channel.

Within the project area only a single previously record site exists. The Bowditch Point Site (8LL778) is recorded as a shell midden occurring within the general vicinity of Bowditch Point Park. The site was originally recorded, as mentioned above, by Diane Boyle of Piper Archaeology as part of a larger survey: *An Archaeological Site Inventory and Zone Management Plan for Lee County, Florida* (Austin 1987). The site was recorded based on the report of a local informant, Mr. Charles Nelson. The site location was later tested by Southarc, *Bowditch Point Regional Park, Lee County Florida*, who was unable to confirm its location. As part of the investigation Southarc conducted shovel testing in what they believed to be the oldest part of the park. All tests were negative. In addition, Martin Dickinson of Southarc contacted Mr. Nelson who was the reported local informant. Mr. Nelson indicated that he knew of no such site existing in Bowditch Point Park and that the report must be error (Dickenson 1989). Notes within the Florida Master Site File (FMSF) forms indicated that there was insufficient evidence to maintain the location of the site as an accurate plot so it determined that the site would be listed instead as occurring in the general vicinity of the reported location. In 2009, the Corps conducted an additional investigation entitled: *Cultural Resource Survey of The Proposed Fort Myers Beach O&M Project, Lee County, Florida* (DHR Letter dated February 25, 2009) to examine the project area for 8LL778 as part of an emergency dredging operation within the project area. No evidence of the archeological site was found and no archeological materials were reported during the dredging operations that involved portions of this project. Currently no determination of eligibility has been made as an actual site has yet to be found.

In addition to this site, there are numerous resources that exist within the general vicinity of the project area. Numerous historic structures exist south of the project area. This is especially true of southern part of Fort Myers Beach. The closest archaeological site is the San Carlos Island Midden which exists on nearby San Carlos Island. This midden has also yet to have any determination of its significance made.

Finally there are no known submerged resources existing within the immediate vicinity of the project area. As single underwater survey entitled, *Cultural Resource Remote Sensing Investigations for Estero Island and Lovers Key Beach Restoration Project* did not find any significant targets and determined that all materials observed in the near shore placement area were the result of modern marine traffic (Bear 2001). In addition a background research for shipwrecks listed in the region do not indicate the presence of any known shipwrecks in the vicinity of the project area.

3.3.10 NOISE

Noise in this area of FMBH is typically limited to that of vessels utilizing the navigational channel in transit from the Gulf of Mexico to Estero Bay and Fort Myers. Commercial and recreational vessels and personal watercraft contribute moderately to the amount of noise in the area.

3.3.11 SAFETY

The Federal channel was designed and authorized for a specific depth and width. Over time, shoal buildup occurs and reduces the navigable capacity of the channel. If the channel is not adequately maintained, the use of the channel becomes a safety hazard for vessels. The USCG is authorized to prohibit the use of channels that pose a safety hazard for vessels.

3.3.12 RECREATION

Estero Island, including Bowditch Point Regional Park and Fort Myers Beach, are heavily populated areas along Florida's Gulf Coast. This region also experiences a large volume of tourists, particularly during the winter months. Estero Island, Estero Bay, and San Carlos Bay provide area citizens and visiting tourists with recreational opportunities that include boating, canoeing, kayaking, fishing, swimming, and educating citizens on the environment. The beach is a popular recreation site when erosion does not prevent its use by beachgoers.

3.3.13 NAVIGATION

In the 1960's initial dredging of a channel for the use of commercial shipping was authorized by Congress for a 12+2-foot channel to access Estero Bay from the Gulf of Mexico for commercial and personal recreation vessels, as well as rescue operations of the USCG vessel Marlin. The FMBH has become an important navigation channel for recreational boating, commercial shrimp harvesting and sport-fishing, excursion boats and general tourism.

3.3.14 ECONOMIC

The FMBH navigation channel is routinely used by the USCG vessel Marlin, various excursion boats, local commercial fishing vessel fleets, and numerous recreational watercrafts to gain access to the Gulf of Mexico from San Carlos Bay and Estero Bay. This channel provides long-term economic stimulus to the economy of the Fort Myers and Fort Myers Beach metropolitan areas from the generation of revenues from the sale of goods and services to the public.

Major land uses in the project area include residential, commercial, and public parks. Numerous marinas occupy the landscape of the waterway along the shoreline of the Federal project area. As well, build up of suitable beach material from beach or nearshore placement insures continued economic growth for commercial businesses along Fort Myers Beach through recreational tourism. Continued channel maintenance benefits the local economy by accommodating increased vessel traffic along the waterway which contributes additional commerce to local communities.

4 ENVIRONMENTAL EFFECTS

4.1 INTRODUCTION

This section is the scientific and analytic basis for the comparisons of the alternatives. See table 1 in section 2.0 Alternatives, for summary of impacts. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.2 WATER QUALITY

4.2.1 NO ACTION ALTERNATIVE

Boats moored in or traveling through the project area could disturb the sediments that have accumulated in the channel with anchors or propellers, potentially causing a chronic increase in local turbidity levels

4.2.2 MAINTENANCE DREDGING

The primary anticipated change in water quality at the dredging site would be a temporary increase in turbidity. According to the State of Florida's Class II water quality standards, turbidity levels during dredging or placement of dredged material are not to exceed 29 nephelometric turbidity units (NTUs) above background levels at the edge of normally a 150-meter mixing zone. In order to comply with this standard, turbidity will be monitored according to State protocols during the proposed dredging work. If at any time the turbidity standard were exceeded, those activities causing the violation would temporarily cease.

4.2.3 MATERIAL PLACEMENT OPTIONS

As with the dredging activity, the primary change in water quality during placement of dredged material within the nearshore and beach would be a temporary increase in turbidity. These activities would be monitored similar to the dredging activity.

4.3 HISTORIC PROPERTIES

4.3.1 NO ACTION ALTERNATIVE

The no action alternative would have no effect on historic properties eligible for inclusion in the National Register of Historic Places

4.3.2 MAINTENANCE DREDGING

Previously in 2009, the Corps consulted on an emergency project that involved dredging of a portion of the federal channel (DHR File No. 2009-00964). As part of this review the Corps has taken into account various surveys conducted within portions of the channel and disposal areas. These include the 2009 Corps report entitled: *Cultural Resource Survey Of The Proposed Fort Myers Beach O&M Project, Lee County, Florida* (DHR Letter dated February 25, 2009), and the 2001 report by Robert Baer entitled : *Cultural Resources Remote Sensing Investigations for the Estero Island and Lovers Key Beach Restoration Project*. (DHR File No 2001-08213). Based on this review the Corps determined a new underwater assessment survey was warranted to cover portions of the project area that have never previously been examined and that an update of work

within the proposed nearshore placement area was required. Furthermore, work conducted in 2009, in Bowditch Park by the Corps remains sufficient to indicate that within the proposed project area within the park there are no known cultural resources and that no additional work is needed within that portion of the project.

To conduct the underwater investigation, the Corps contracted with Panamerican Consultants Inc. (PCI), which performed the underwater survey of the needed area. Their report is entitled: *Cultural Resources Remote Sensing Survey of the Fort Myers Maintenance Dredging Project, Lee County, Florida*. PCI identified 6 magnetic anomalies that it considered potentially significant based on magnetometer data. No significant targets were observed resulting from the side scan and subbottom profiling work. All six targets are outside the federal channel but two fall near the proposed pipeline route and 4 fall within the proposed nearshore placement area. All are currently located below the surface and would not be impacted by sand placement over them. To further protect each of these areas the Corps will establish a minimum of a 100 foot buffer around all six potential significant anomalies. Within all buffers, no anchoring, spudding or direct outfall would be permitted.

The Corps has determined that the proposed dredging of FMBH poses no adverse effect to historic properties as the dredging buffers would provide sufficient protection to identified anomalies. The Corps consulted with the SHPO and appropriate federally recognized tribes on this determination as well as any comments on PCI's draft report entitled: *Cultural Resources Remote Sensing Survey of the Fort Myers Maintenance Dredging Project, Lee County, Florida* via letter dated 30 January 2012.

4.3.3 MATERIAL PLACEMENT OPTIONS

As stated above, 4 magnetic anomalies identified by PCI are located within the nearshore placement area. All are currently located below the surface and would not be impacted by sand placement over them. To further protect each of these areas the Corps would establish a minimum of a 100 foot buffer around all 4 potential significant anomalies. Within all buffers, no anchoring, spudding or direct outfall would be permitted. Sand placement in the nearshore area would be allowed to cover over the anomalies. However, additional cultural resource investigations are needed prior to using the beach placement area.

4.4 NOISE

4.4.1 NO ACTION ALTERNATIVE

Grounding vessels and the rescue equipment required to free them could generate increased local noise levels as the channel shoals in and becomes impassable.

4.4.2 MAINTENANCE DREDGING

There could be a slight temporary increase in noise levels from the maintenance dredging but background levels from vessel traffic and general public within the area are already moderate. Noise levels would return to background levels upon completion of the project.

4.4.3 MATERIAL PLACEMENT OPTIONS

There could be temporary increases in noise levels at the placement sites during the operation of the discharge equipment. Beach placement is anticipated to generate more noise above background than nearshore placement due to the heavy equipment needed to rework the dredged material on the dry beach. Noise levels would return to background levels upon completion of the project.

4.5 SAFETY

4.5.1 NO ACTION ALTERNATIVE

Long-term adverse impacts to vessel safety from unaddressed channel shoaling and reduced navigability are anticipated as a result of this alternative. As the channel shoals, larger craft, such as commercial fishing and excursion vessels, would be required to deviate to the northwest outside of the authorized Federal channel due the obstruction. This scenario significantly increases the risk of vessel groundings, as was documented by correspondence from the USCG during the 2008-9 emergency dredging coordination, Appendix C

4.5.2 MAINTENANCE DREDGING

The proposed maintenance would remove shoaling obstructions from the FMBH Federal channel which would improve navigational safety by eliminating one of the primary causes of vessel grounding. This alternative would increase overall boater safety by facilitating improved access to Estero Bay for all vessels including the USCG. Temporary impacts to navigation are anticipated from the presence of the dredge equipment during construction.

4.5.3 MATERIAL PLACEMENT OPTIONS

Dredge barge and pipelines could temporarily alter navigation patterns during construction; however, authorized channel depths would be restored which would provide a lasting beneficial impact.

4.6 WILDLIFE RESOURCES

4.6.1 NO ACTION ALTERNATIVE

Physical habitat mapping conducted since the last channel dredging in 2009 has shown that there was no long-term net loss of habitat (roosting, nesting, and foraging) as a result of the dredging so not dredging could have a negligible effect on wildlife resources utilizing the project area.

4.6.2 MAINTENANCE DREDGING

4.6.2.1 Marine Mammals

No impacts to any marine mammals, particularly the West Indian manatee and bottlenose dolphin, are anticipated during the proposed maintenance dredging. During the last maintenance event marine mammal observers (MMO) located on the dredge during operation documented a total of three species during the dredging activity from 24 May 2009 to 16 July 2009. These included bottlenose dolphin, Atlantic spotted dolphin, and manatee.

4.6.2.2 Migratory Birds

Temporary impacts to migratory birds are anticipated as a result of the proposed maintenance dredging from removal of dry beach which has grown into the Federal channel. However, post-construction monitoring reports from 2009 indicate a diverse and healthy population of wading and shorebirds to be present along the shoreline adjacent to FMBH Federal channel.

4.6.2.3 Seagrass

No seagrass was present within the Federal channel at time of the emergency action in 2009. However, SAV was located outside of all dredged areas including the advanced maintenance area. No impact occurred to this resource as a result of the dredging in 2009. Finally, as discussed in section 3.3.7 above, a project-specific survey for submerged aquatic natural resources entitled *Final Seagrass and Hardbottom Survey* was conducted by CSA International, Inc. during the summer of 2011 and determined that there were several small seagrass colonies occurring adjacent to FMBH Cuts 8 and 9, see **Figure 12**. The beds contained predominantly shoal grass (*Halophila wrightii)* with a minor amount of turtle grass (*Thalassia testudinum)* mixed with shoal grass in one location. These colonies are not within the Federal channel; rather, they are present on the outer-most edge of a 50-foot buffer study area where no dredging is proposed. According to the report, the total area of seagrass habitat within the 50-foot buffer zone adjacent to the channel covers an area of 2,216 sq feet (0.05 acre).

4.6.3 MATERIAL PLACEMENT OPTIONS

Wildlife impacts from either placement alternative are expected to be short-term and minimal during construction. Both placement alternatives could temporarily impact wildlife utilizing the areas; mobile species could relocate away from the dredging disturbance but it is also anticipated that some species will be attracted to the pipe outfall and actively forage on the entrained organisms in the dredged material. In addition, migrating dredged sediment is also anticipated to augment and increase wildlife habitat as the material migrates towards and onto the dry beach.

4.7 THREATENED AND ENDANGERED SPECIES

4.7.1 NO ACTION ALTERNATIVE

4.7.1.1 Manatee

Manatees could become injured through collision or trapped by large vessels passing overhead if the clearance between the channel bottom and vessel hull is not adequately maintained.

4.7.1.2 Sea Turtle

No action could result in loss of sea turtle nesting beach due to continued erosion due to the lack of beach or nearshore placement of the dredged material.

4.7.1.3 Piping plover

There would be no impact to Piping Plover critical habitat unit FL-25 from the no action alternative. In fact, FL-25 could increase in area as the sand accumulates into the channel.

4.7.1.4 Smalltooth Sawfish

The no action alternative is not expected to significantly impact smalltooth sawfish. Shallower estuarine waters are more suitable (contain the essential elements) for juvenile sawfish nursery habitat.

4.7.2 MAINTENANCE DREDGING

4.7.2.1 Manatee

No impacts to manatees are anticipated as a result of the proposed dredging. During the last maintenance event in 2009, MMO observers documented manatee activity occurring within 50 feet of the dredge which resulted in a temporary shutdown of the operation until the manatees safely migrated away from the work zone. In order to not adversely affect the manatee, the Corps would comply with the Service's Standard Manatee Conditions for In-water Work during dredging. The USFWS concurred with this determination in their 21 August 2012 BO (see Appendix C).

4.7.2.2 Sea Turtles

Removal of the accreted material within the authorized Federal channel could temporarily affect sea turtle nesting habitat. However, according to the 2010 sea turtle monitoring report (Haverfield, 2010), sea turtle activity post-construction in 2010 showed similar nest distribution patterns as those observed in 2007. A total of twenty-three (23) nests and twenty-two (22) non-nesting emergences were documented along the entire Fort Myers Beach shoreline. No nests were found within the placement area or north toward Bowditch Point, although two non-nesting emergences between the Pier and Bowditch Point Park (from R-175 to R-182) were found along the shoreline of the nearshore placement area (from R-182 to R-187A) during the same time period of 2010. All requirements of the NMFS GRBO would be followed during dredging in order to minimize impacts to swimming sea turtles.

4.7.2.3 Piping Plover

Alteration of Piping Plover critical habitat unit FL-25 resulted from the 2009 emergency maintenance dredging event which removed accreted material (dry beach) from within the Federal channel. The dredged material corresponded to approximately 1.75 acres which had an effect upon 2.5 acres of critical habitat. Pursuant to the USFWS BO of 2009 [41420-2009-FA-0132 / SAJ-1995-7482 (IP-MJD)] for the emergency dredging event, the action as proposed would not result in jeopardy to piping plovers. Although 2.5 acres of piping plover critical habitat was affected, the reopening of FMBH did not decrease the amount of critical habitat from the level that existed when Unit FL-25 was designated. In addition, the greater extent of critical habitat Unit FL-25 remained intact to the north and west of the project site. Therefore, the Service determined the project would not result in adverse modification of critical habitat for piping plover.

As shown in **Figure 13,** piping plover habitat at the northeastern tip of Bowditch Point increased through the accretion of material extending into the FMBH Federal navigation channel between 2005 to 2008. The hatched areas on the figures represent habitat for wintering piping plover that include one or more of the primary constituent elements (PCE's) described in Section 3.3.6.3.

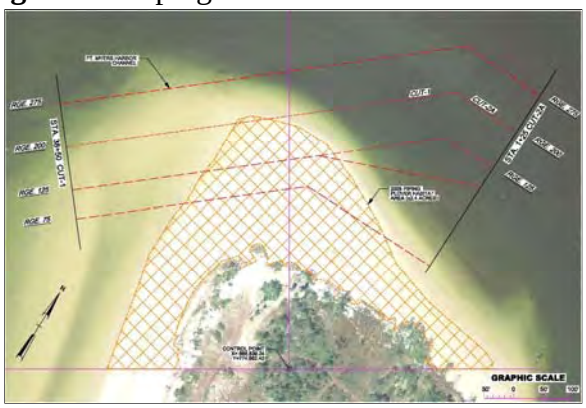
The areas containing extensive brush and raised elevation are outside of the hatched area as these conditions are less than suitable for usage by piping plover. Comparison of the four years shows that as the accreted material extended waterward, dense vegetation also developed at the point's tip; thus, 2.4 acres of suitable piping plover habitat present in 2005 increased by +0.1 acre to 2.5 acres by 2008. In contrast, the 2010 picture depicts conditions after the emergency dredging event of 2009, in which 1.7 acres of suitable piping plover habitat was present on the shoreline of Bowditch Point adjacent to the newly opened Federal channel. The net change represents a -0.7 acre loss of piping plover habitat within the Critical Habitat Unit FL-25 from the base year in 2005 to post-dredge in 2010. Furthermore, no direct effect to any other areas along the shoreline within the Critical Habitat Unit FL-25, such as the discharge pipe run or the nearshore placement area occurred as a result of the emergency dredging action.

The September 2011 aerial imagery shows a dramatically changed coastline due in part to the construction of the Lee County rock groin and beach renourishment project located along the northwestern tip of Estero Island. Due to the dynamic ocean environment, tidal influences and estuarine bay processes have resulted in a build-up of material both around and in front of the groin. Also, additional beach has built up along the northeastern bayside of Bowditch Point from material carried by waves refracting around the island end. The additional material has compensated for the initial loss of -0.7 acres by accumulating 3.2 acres total for a net gain of +0.8 acres (Figure 13).

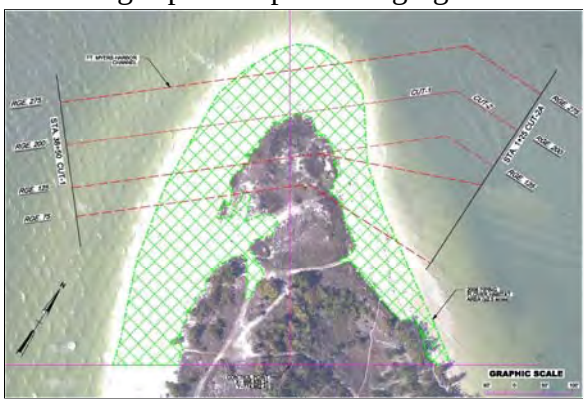
Although the Lee County groin and beach re-nourishment project has had an effect on the re-establishment of this habitat, natural processes account for dynamic transition of this area from the relationship between ebb shoal deposition causing inlet closure and current velocities from flood tidal flow interactions (Humiston and Moore Engineers, 2008). This inlet migration of material is essential for the dynamic shift in piping plover habitat in a beach environment (ERDC, 2009). As the material is re-deposited along the shoreline, the character of the habitat likewise changes. Shallow intertidal pools have developed immediately north of the newly constructed groin, and also a small area off the northeast point. The material in these tidal pools typically consists of fine sand that is deposited by low water velocity in flood tidal flows (ERDC, 2009). These pools are attractive to piping plover at low tide when the substrate is exposed for foraging (USFWS, 2011 website factsheet). Meanwhile, areas that contain deposits of more coarse-grained material create the foundation for upland dune transition to mesic saltmarsh (Lippson and Lippson, 2009). As dunes are created in these areas, habitat suitability for wintering piping plover diminishes. However, the constant movement of sand from both natural and man-made (dredging and beach or nearshore placement) processes should continue to maintain the existing habitat for non-breeding piping plover.

A post-construction shorebird monitoring survey was conducted between 2009 until June, 2010 in association with this project. Of the thirty-three (33) species observed within or adjacent to the project site, no piping plover were found to be present during either survey.

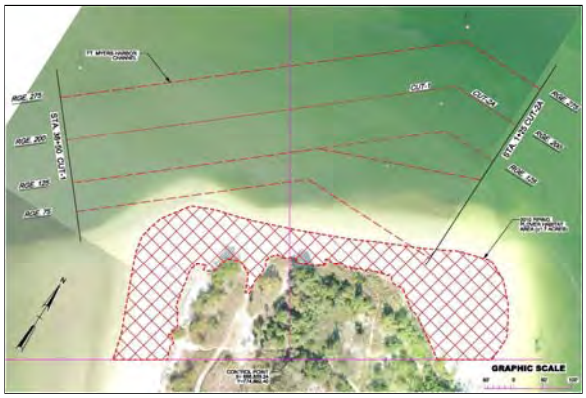
Figure 13. Piping Plover Critical Habitat Unit FL-25 changes pre and post-dredging.



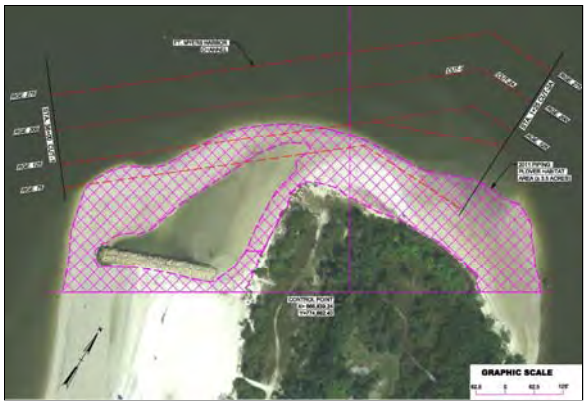
2005 = 2.4 acres



2008 = 2.5 acres



2010 = 1.7 acres



2011 = 3.2 acres

Table 6. Piping Plover Critical Habitat Unit FL-25 changes pre and post-dredging.

Year	Estimated Acreage Of Unit FL-25	Difference from Base Year (acres)
2005 pre-dredge +3 years	**2.4**	**Base year**
2008 pre-dredge +1 year	**2.5**	**+0.1**
2010 post-dredge +1 year	**1.7**	**-0.7**
2011 post-dredge +2 years	**3.2**	**+0.8**

4.7.2.4 Smalltooth Sawfish

In order to not adversely affect the smalltooth sawfish, the Corps would comply with the NMFS's Sea Turtle and Smalltooth Sawfish Construction Conditions during dredging. Although the proposed project overlaps critical habitat maps for the species, the channel area to be dredged does not contain the primary constituent elements which comprise smalltooth sawfish critical habitat. These essential features include red mangroves and shallow euryhaline habitats characterized by water depths between the MHW line and 3 ft (0.9 m) measured at MLLW. Per the final critical habitat rule (Federal Register Volume 74, No. 169, page 45361): "Exclusions are not applicable to areas, like those proposed by the ACOE, which will not be impacted by the designation because they do not provide the essential features of critical habitat and will not require section 7 consultation for activities in those areas. As stated in the proposed rule, all existing man-made structures such as boat ramps, docks, pilings**, maintained channels** or marinas that do not provide the essential features that are essential to the species' conservation are not part of this designation. The three existing federally authorized channels located within the proposed designation are the Charlotte Harbor, FMBH, and portions of the Intracoastal Waterway in the Caloosahatchee River. These existing Federal channels have been authorized to be dredged and maintained to depths greater than 3 ft (0.9 m) at MLLW. The channels may contain the euryhaline component of the shallow habitat essential feature, but they do not contain the water depth component, or the red mangrove essential feature." Therefore, per the final rule above, the proposed action would not impact smalltooth sawfish critical habitat.

4.7.3 MATERIAL PLACEMENT OPTIONS

4.7.3.1 Manatee

In order to not adversely affect the manatee, the Corps would comply with the Service's Standard Manatee Conditions for In-water Work during beach and nearshore placement activities. However, there were no impacts to manatees as a result of the emergency maintenance action with nearshore placement in 2009.

4.7.3.2 Sea Turtles

Per the USFWS Statewide Programmatic Biological Opinion dated April 19, 2011, as amended on August 22, 2011 SPBO, daily early morning surveys for sea turtle nests will be required if any portion of the beach placement occurs during the period from May 1 through October 31. Only those sea turtle nests that may be affected by the placement activities will be relocated the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. However, per the SPBO, the Corps and USFWS have determined that nearshore placement would be not likely to adversely affect nesting sea turtles. Therefore, daily surveys for sea turtle nests are not required if any portion of the nearshore placement occurs during the period from May 1 through October 31 (see USFWS BO dated 21 August 2012 in Appendix C).

4.7.3.3 Piping Plover

Both placement options have the potential to benefit wintering piping plover critical habitat. Beach placement could directly increase the amount of critical habitat available. In addition, physical monitoring conducted since the 2009 emergency maintenance dredging with nearshore

placement indicates that: "O*ver the first year of monitoring, sedimentologic results indicate dispersion of finer sediments downdrift and offshore of the natural bar over the control area. Results indicate that the project design was successful in that sand-sized sediments are migrating onshore and finer sediments are moving offshore"* ERDC/CHL CHETN-XIV-10 January 2012.

Based on these results, and in addition to the net acreage gain to piping plover critical habitat Unit FL-25 discussed in Section 4.7.2.3, the Corps has determined that the proposed maintenance dredging with beach or nearshore placement is not likely to result in jeopardy to piping plover and would not result in an adverse modification of piping plover critical habitat. The USFWS concurred with this determination in their BO dated 21 August 2012 (see Appendix C).

4.7.3.4 Smalltooth Sawfish

In order to not adversely affect the smalltooth sawfish, the Corps would comply with the NMFS's Sea Turtle and Smalltooth Sawfish Conditions during beach and nearshore placement activities.

4.8 ESSENTIAL FISH HABITAT

Section 3.3.7 describes the "existing conditions" of the Essential Fish Habitat (EFH) in the project area. This is defined as "federally managed fisheries, and associated species such as major prey species, including affected life history stages." The following subsections describe the individual and cumulative impacts of the no action and preferred alternatives on EFH, federally managed fisheries, and associated species such as major prey species, including the affected life history stages.

4.8.1 NO ACTION ALTERNATIVE

Increased shoal build-up in the Federal channel could lead to vessel bottom strikes, which could cause temporary increases in turbidity, further degrading habitat for fish.

4.8.2 MAINTENANCE DREDGING

The proposed maintenance dredging of the project channels could impact approximately 96 acres of previously dredged estuarine/inshore water column and unconsolidated substrate. Species managed by the NMFS that are common within the project area can be found in Table 3, and prey species in Table 4. The Corps has determined that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries along the southwestern Gulf coast of Florida. This determination was based on the fact that the substrate of the project area is naturally dynamic and unconsolidated, and measures shall be taken to protect adjacent habitat. Turbidity could affect vision of marine life within the sediment plume as well as those marine organisms with gills, but these effects would be temporary as they would be limited to the actual dredging and placement operations. Routine maintenance dredging may suppress re-colonization of certain benthic organisms and therefore could impact other trophic levels within the food chain. However, it is important to note that the project channels are man-made, the actual channel widths encompass a fraction of the entire water body, and similar habitat occurs

immediately adjacent to the channels. In addition, the FMBH maintenance dredging is anticipated to take up to 90 days every 3 to 5 years and migrating larvae and/or juvenile fish could be subject to project related elevated turbidity and suspended sediment levels during that time period. The NMFS concurred with this assessment via email dated 17 July 2012 (see Appendix C).

4.8.3 MATERIAL PLACEMENT OPTIONS

Placement of dredged material into the nearshore or beach could directly and indirectly impact approximately 58 acres of marine/offshore water column and unconsolidated substrate and 21 acres of ocean high salinity surf zone respectively. Based on the historic dredging record, sand could be placed approximately every 3-5 years and, therefore, the possibility of longer term adverse impacts (i.e. suppression of re-colonization of the infaunal community) is not likely. In addition, placement along portions of these areas has occurred on multiple occasions over the past 50 years, the dredged sediment is anticipated to be similar in composition to the existing beach and nearshore sediments, and only small portions of the placement areas are anticipated to be used during each individual dredging event. The NMFS concurred with this assessment via email dated 17 July 2012 (see Appendix C).

4.9 AESTHETICS

4.9.1 NO ACTION ALTERNATIVE

There would be no affect on landscape aesthetics by pursuing the no action alternative.

4.9.2 MAINTENANCE DREDGING

Temporary air pollution, water turbidity, and noise pollution increases can be expected during project construction. The dredge equipment will have a temporary effect on the view shed until completion of the project.

4.9.3 MATERIAL PLACENT OPTIONS

Temporary air pollution, water turbidity, and noise pollution increases can be expected during the placement of dredged material onto the beach or into the nearshore placement areas. Conversely, dredged material placement on Fort Myers Beach and in the nearshore should augment the beach habitat available which could improve the areas aesthetic resources.

4.10 NAVIGATION

4.10.1 NO ACTION ALTERNATIVE

The No Action Alternative would result in a decrease in the navigability of the channel over time as sediments accumulate in the channel causing obstructions by shoal build-up.

4.10.2 MAINTENANCE DREDGING

The proposed action could result in a temporary disruption of normal vessel traffic in the channel due to the presence and operation of the dredge. However, long-term benefits to navigational safety would result from the action as proposed.

4.10.3 MATERIAL PLACEMENT OPTIONS

As with the maintenance dredging alternative, beach or nearshore placement could result in a temporary disruption of normal vessel traffic in the area due to the presence and operation of the material transport and deposition equipment.

4.11 ECONOMICS

4.11.1 NO ACTION ALTERNATIVE

A potential decline in the revenue-generating capabilities of the commercial and recreational centers of Estero Island, including Fort Myers Beach, would be probable as the build-up of shoal material prevents access by recreational and commercial boaters.

4.11.2 MAINTENANCE DREDGING

There would be a minor short-term economic stimulus to the local economy from the sale of goods and services in support of the dredging operation. The deepening of the Federal navigational channel encouraged the construction of commercial and recreational centers on Estero Island, and associated local marinas and restaurants have had a positive effect on the local economy.

4.11.3 MATERIAL PLACEMENT OPTIONS

Beach or nearshore placement could help augment and maintain a recreational beach which generates revenue from tourism.

4.12 NATIVE AMERICANS

The project will not affect any Native American properties. Coordination with the following federally recognized tribes occurred during the noticing of this EA: Seminole Tribe of Florida and Miccosukee Tribe of Indians of Florida. Consultation as part of the National Historic Preservation Act is ongoing, see section 5.3 of this document. As this is maintenance of an existing channel, and the beach and nearshore placement areas have been used multiple times in the past, no impacts to Native American resources or properties are anticipated from any of the proposed alternatives.

4.13 CUMULATIVE IMPACTS

4.13.1 NO ACTION ALTERNATIVE

Continued shoaling within the FMBH Federal channel would continue with adverse consequences to navigation, wildlife through potential collisions, socio-economic operations within the community, and navigational safety through the inability of the USCG to respond to emergency operations and distress calls.

4.13.2 MAINTENANCE DREDGING

The proposed action could result in a temporary loss of critical habitat for wintering piping plover as well as temporary loss of sea turtle nesting beach. However, due to the dynamic coastal processes along the shoreline adjacent to the dredge area between 2008 to 2011 these

losses were self-compensating. That is, once the shoreline reached equilibrium post dredge, a net gain in acreage to piping plover critical habitat unit FL-25 occurred.

4.13.3 MATERIAL PLACEMENT OPTIONS

Additional benefit may result from the placement of dredged material on the beach or in the nearshore immediately adjacent to Fort Myers Beach by alleviating erosion of the shoreline.

4.14 UNAVOIDABLE ADVERSE ENVIRONMENTAL IMPACTS

4.14.1 NO ACTION ALTERNATIVE

The no action alternative would result in avoidable effects to the resources as discussed in the Section 4.

4.14.2 MAINTENACE DREDGING

Maintenance activities could result in some turbidity generated at the dredging site and the excavation of the material could eliminate benthic organisms within the dredging cuts. In addition, there could be a short-term disruption to recreational and commercial navigation in the Federal channel from the presence and operation of the dredging equipment.

4.14.3 MATERIAL PLACEMENT OPTIONS

Maintenance activities could result in some turbidity generated at the placement sites. Placement operations could bury benthic organisms present at the placement sites. In addition, there could be a short-term disruption to recreational and commercial navigation during placement activities.

4.15 IRREVERSIBLE AND IRRETRIEVABLE RESOURCE COMMITMENTS

Other than the use of fuel, equipment and supplies, there would be no irreversible commitment of resources from the proposed action. Dredging could temporarily disrupt navigation and recreational activities.

5 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

5.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project was compiled and this EA was prepared and noticed. The project is in compliance with the National Environmental Policy Act (NEPA).

5.2 ENDANGERED SPECIES ACT OF 1973

This project has been coordinated with the NMFS through the GRBO dated November 19, 2003, as amended on June 24, 2005 and January 9, 2007. The draft NOA and FONSI, mailed to NMFS Protected Resources Division on 5 April 2012, discuss the application of the GRBO consultation to this project. No comments or response was received from NMFS PRD and the GRBO consultation is complete. Coordination with the USFWS through the Statewide Programmatic Biological Opinion dated April 19, 2011, as amended on August 22, 2011 also occurred. The Corps submitted a SPBO letter to the USFWS on 13 March 2012 and the USFWS indicated via

email dated 23 May 2012 that the SPBO is applicable to this project but that in addition a separate piping plover BO was needed. Finally, the USFWS provided the SPBO letter and piping plover BO dated 21 August 2012 thus completing consultation for this project under this Act.

5.3 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

Consultation with the Florida State Historic Preservation Officer (SHPO) was completed in accordance with the National Historic Preservation Act (NHPA) of 1966, as amended for the maintenance dredging of FMBH with dredged material placement in the nearshore area. As part of the requirements and consultation processes contained within the NHPA implementing regulations of 36 CFR 800, this project will also be in compliance with the Archeological Resources Protection Act (96-95), American Indian Religious Freedom Act (PL 95-341), Executive Orders (E.O) 11593, 13007, & 13175 and the Presidential Memo of 1994 on Government to Government Relations. The Corps has made a determination of no adverse effect to historic properties for this project. Consultation with the SHPO, Miccosukee Tribe of Indians of Florida and the Seminole Tribe of Florida was initiated via letter dated 30 January 2012. Letters were received from the SHPO (9 March 2012) and Seminole Tribe of Florida (20 April 2012) concurring with this determination. Finally, as stated in Section 2.3, additional cultural resource investigations would be required prior to use of the beach placement area.

5.4 CLEAN WATER ACT OF 1972

A Section 401 water quality certification from DEP was issued March 16, 2009 (DEP File No. 0158893-005-JC). Also, a minor modification to the permit (DEP File no. 0158893-008-BN) was issued on July 10, 2009 that included maintenance action within another shoaled area of the authorized Federal channel. Finally, an application for a major modification was submitted to DEP on 4 June 2012 to include the remaining FMBH cuts 4-10 and the turning basin in this JCP. Upon issuance, this project will be in compliance with this Act. All state water quality standards would be met. A Section 404(b) evaluation is included in this EA as Appendix A.

5.5 CLEAN AIR ACT OF 1972

The draft version of this EA was coordinated with the US Environmental Protection Agency (EPA) to comply with Section 309 of the Act. This project is not anticipated to produce any significant new atmospheric emissions; therefore, it is anticipated that this project would comply with the Clean Air Act.

5.6 COASTAL ZONE MANAGEMENT ACT OF 1972

A Federal consistency determination (CD) in accordance with 15 CFR 930 Subpart C of the Coastal Zone Management Act (CZMA) is included in this report as Appendix B. The State of Florida concurred that the project is consistent with the Florida Coastal Zone Management Program through the issuance of the DEP JCP (DEP File No. 10158893-005-JC).

5.7 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland was impacted by implementation of this project. Therefore, this project is in compliance with this Act.

5.8 WILD AND SCENIC RIVER ACT OF 1968

No designated wild and scenic river reaches were affected by the project related activities. Therefore, this project is in compliance with this act.

5.9 MARINE AND MAMMAL PROTECTION ACT OF 1972

To ensure the protection of any manatees present in the project area, the conditions outlined in DEP permit no. 10158893-005-JC and the standard USFWS manatee construction conditions for in-water work would be implemented during dredging. Manatee observers would be on-board the dredge during operations in order to perform the manatee protection monitoring, such as shut-down of dredging operations upon manatees sighted within a 50-foot radius of the dredge until they move further than 50-feet away from the operation. This project is in compliance with this act.

5.10 ESTUARY PROTECTION ACT OF 1968

The protective measures outlined in section 4 would insure avoidance and minimization of impacts to San Carlos Bay, Estero Bay Aquatic Preserve, and Charlotte Harbor Aquatic Preserve from the proposed dredging. Therefore, this project is in compliance with this act.

5.11 FEDERAL WATER PROJECT RECREATION ACT

Although FMBH provides recreational benefits, the principles of the Federal Water Project Recreation Act, (Public Law 89-72) as amended, are not applicable to this project which is Operations and Maintenance of an existing Federal navigation channel.

5.12 SUBMERGED LANDS ACT OF 1953

Dredging and beach or nearshore placement would occur on submerged lands of the State of Florida. This project has been coordinated with the State which issued DEP JCP File No. 10158893-005-JC which addresses the Sovereign Submerged Lands authorization. Therefore, the project is in compliance with this Act.

5.13 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER INPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that will be affected by this project. Therefore, this project is in compliance with these Acts.

5.14 RIVERS AND HARBORS ACT OF 1899

The proposed work could temporarily obstruct navigable waters of the United States but would ultimately improve navigability of these waters. The proposed action had been subjected to the public notice and other evaluations normally conducted for activities subject to the act. The project is in full compliance with this Act.

5.15 ANADROMOUS FISH AND CONSERVATION ACT

Anadromous fish species would not be affected by the proposed work. The project was coordinated with the NMFS and is in compliance with the Act.

5.16 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

Measures shall be taken to protect migratory birds, i.e. avoiding nesting sites during dredging of suitable habitat (dry land) at Bowditch Point and should the beach placement area be used. Therefore, the project would be in compliance with these Acts.

5.17 MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT

The term *dumping* as defined in the Act (3[33 U.S.C. 1402](f)) does not apply 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). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this EA have been evaluated under Section 404 of the Clean Water Act.

5.18 MAGNUSON – STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Corps has determined that the project would not have a substantial adverse impact on EFH or federally managed fish species occurring along the southeast coast of Florida. EFH coordination for the proposed work was initiated with the NMFS Habitat Conservation Division (HCD) concurrently with the noticing of the draft EA on 5 April 2012. NMFS HCD concurred with the Corps determination via email dated 17 July 2012 in which they stated: "…, we anticipate that any adverse effects that might occur on marine and anadromous fishery resources would be minimal and, therefore, do not object to authorization of this activity." The project is in full compliance with the act.

5.19 E.O. 11990, PROTECTION OF WETLANDS

No wetlands would be affected by the proposed project activities. This project is in compliance with this Executive Order.

5.20 E.O. 11988 FLOODPLAIN MANAGEMENT

This project would have no adverse impacts to flood plain management.

5.21 E.O. 12898 ENVIRONMENTAL JUSTICE

This project would not result in adverse human health or substantial environmental effects. In addition, no impacts on the ability of minority or low-income populations to obtain fish or wildlife for subsistence consumption are anticipated to occur. Therefore, no impacts to minority or low-income populations are anticipated and this project is in compliance with this Executive Order.

5.22 E.O. 13089, CORAL REEF PROTECTION

There are no coral reefs located in the project area, nor are there any "species, habitats, and other natural resources associated with coral reefs." This project is in compliance with this Executive Order.

5.23 E.O. 13112, INVASIVE SPECIES

This project is not anticipated to introduce any invasive species. This project is in compliance with this Executive Order.

6 PREPARERS

6.1 REVIEWERS

Preparer	Discipline	Role
Paul DeMarco	Biologist	Author
Kathleen McConnell	Biologist	Co-author
James Lagrone	Engineer	Engineering
Daniel Hughes	Archeologist	Cultural Resources
Jase Ousley	Geologist	Geo-tech Discussion

6.2 REVIEWERS

Reviewer	Discipline	Role
Jason Spinning	PD-EC Chief	Review
Eric Summa	PD-E Branch Chief	Review
Jackie Keiser	PM-WN Chief	Review
Laurel Reichold	Project Manager	Review

7 PUBLIC INVOLVEMENT

7.1 SCOPING AND DRAFT EA

A Notice of Availability (NOA) of the draft Finding of No Significant Impact (FONSI) and Draft Environmental Assessment (DEA) was issued 5 April 2012 for the routine maintenance dredging project which included a 30 day public comment period. A copy of the Public Notice is included in Appendix C.

7.2 AGENCY COORDINATION

The EA was coordinated with the appropriate agencies (DEP, USFWS, EPA and NMFS). All agency coordination letters received as a result of this effort are included in Appendix C. In addition, agency comments are summarized in 7.4 below and in sections 4 and 5 above.

7.3 LIST OF RECIPIENTS

The PN was made available to the public for a 30 day comment period. A list of recipients is attached to the PN in Appendix C.

7.4 COMMENTS RECEIVED AND RESPONSES

Comments received and responses were incorporated into this final document. In addition, the Florida State Clearinghouse coordinated review of the Draft FONSI and EA was conducted with appropriate State agencies and their compiled comments were received via letter dated 7 June 2012. These comments are listed and discussed below:

- The Florida Fish and Wildlife Conservation Commission (FWC) advises that in-water work associated with vessel operations and nearshore sediment placement activities could adversely affect Florida manatees, marine turtles, shorebirds and seabirds; Therefore, the FWC recommends: that the Draft EA incorporate the USFWS 2011 Standard Manatee Conditions for In-water Work for all dredging activities, including the use of wildlife observers and avoid mechanical dredging and movement of vessels during nighttime hours, the conditions set forth in the USFWS SPBO be incorporated into the project design, and protective measures for shorebirds be employed to prevent take of these species.

- RESPONSE: As stated in section 4.7.2.1 (page 41), the USFWS Standard Manatee Conditions for In-water Work would be followed for all dredging activities, including the use of wildlife observers. In addition, the terms and conditions of the USFWS SPBO would also be incorporated into the project plans and specifications. Finally, should the beach placement area be used, appropriate measures to insure the protection of migratory birds would be incorporated into the project plans and specifications to prevent take under the Migratory Bird Treaty Act.

- The Florida DEP Bureau of Beaches and Coastal Systems notes that the proposed federal channel maintenance dredging with beach and nearshore placement of sediment will require a modification to JCP No. 0158893-005-JC.

- RESPONSE: As stated in sections 1.7 and 5.4, an application for a major permit modification to JCP No. 0158893-005-JC was submitted to DEP on 4 June 2012. This modification would include the additional FMBH channel cuts 4-10 and the turning basin in the JCP. At the time of this writing, no application for beach placement has been submitted to DEP. Therefore, prior to use of the beach placement area, the JCP would need to be further modified.

- The Southwest Florida Regional Planning Council finds the Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement – Fort Myers Beach, Lee County, Florida to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

- RESPONSE: None required, comments noted.

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APPENDIX A - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION

MAINTENANCE DREDGING
FORT MYERS BEACH HARBOR
WITH BEACH AND NEARSHORE PLACEMENT
LEE COUNTY, FLORIDA

I. Project Description

a. Location. FMBH is a Federal navigation channel located adjacent to the north tip of Estero Island near the city of Fort Myers Beach, Lee County, FL. The dredge site is located within the Federal channel Cuts 1-10 and the turning basin, in Section 24, Township 46 South, Range 23 East, which separates Carlos Bay from the Gulf of Mexico, a Class III Waters, see Figure 1. The dredged material placement areas are located on the beach of Estero Island, between DEP Reference Monuments R-178 and R-184 and in the nearshore portion of Estero Island, between DEP Reference Monuments R-182 and R-187A immediately southeast of the Fort Myers Beach Pier, Figure 2. The beach placement area is approximately 21 acres while the nearshore placement area encompasses approximately 58 acres and is located between 200 feet and 700 feet water ward of the mean lower low water (MLLW) of Fort Myers Beach in the Gulf of Mexico.

b. General Description. The Jacksonville District is proposing to conduct periodic maintenance dredging of the Federal FMBH project in Lee County, FL. This would include FMBH Cuts 1-10 and the turning basin (see Figure 1, Project Map). All of the dredged material would be placed either on the beach between DEP monuments R-178 to R-184 or in the nearshore placement area between DEP monuments R-182 to R-187A. The Federal channel would be maintained to its authorized dimensions of 150-feet wide by 12-feet deep plus 2-feet of allowable over-depth at mean lower low water (MLLW) from San Carlos Bay to Matanzas Pass (FMBH Cuts 1-6) and 125-foot wide by 11-foot deep plus 2-feet of allowable over-depth at MLLW through the Pass to the upper shrimp terminals (FMBH Cuts 7-10 and the turning basin).

c. Authority and Purpose. The Rivers and Harbors Act Section 110, approved 17 May 1950 (Public Law 516, 81th Congress, 2st session), provided the authorization for "feasibility of providing a permanent channel form the Gulf of Mexico into Fort Myers Beach, Estero Island, Florida." On 23 June 1959 House Document 183 86/11 authorized construction of an improved channel 12-foot deep and 150-foot wide from the San Carlos Bay to the Matanzas Pass, thence 11-foot deep and 125-foot wide through the Pass to the upper shrimp terminals, a total distance of approximately 2.5 miles.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The material within the dredging depths consists of poorly graded, fine to medium quartz sand with 1 to 17 percent fine grained material and shell fragment. Content of silt/shell fragment is less than 10% fine-grained material, which meets DEP criteria for beach placement of maintenance dredged material. The 2008 Geo-technical Report concluded that the overall dredge

material is slightly finer but is acceptable for beach fill for grain size, and fairly matches the color as noted.

(2) Quantity of Material. An estimated average quantity of approximately 120,000-150,000 cy of dredged material would be removed from the Federal channel approximately every 3-5 years.

(3) Source of Material. Dredged material could come from FMBH Federal channel Cuts 1-10 and the turning basin.

e. Description of the Proposed Discharge Site(s).

(1) Location. The beach placement area is located along the shoreline of Fort Myers Beach on Estero Island between DEP Reference Monuments R-178 to R-184. Meanwhile, the nearshore placement area is located from 200 feet to 700 feet offshore Fort Myers Beach; the dimensions are 5,000 feet by 500 feet, **Figure 2**. Depth of the placement would be from -4 feet to -6 feet, with none higher than -2.5 feet at the MLLW line.

(2) Size. Beach placement area: 21.2 acres; Nearshore placement area: 57.9 acres.

(3) Type of Site: West facing (Gulf of Mexico) beach and nearshore open-water environments.

(4) Type(s) of Habitat. Ocean high-salinity surf-zone and open water habitat with unconsolidated substrate (please see EA section 3 for more information).

(5) Timing and Duration of Discharge. Beach or nearshore placement could occur year-round.

f. Description of Disposal Method. For beach placement area use, most likely a cutter-head dredge would be used and the dredged material pumped through a pipeline to the beach. However, a hopper dredge or barge/scow with pump-out capability could also place material there. Finally for the nearshore placement area, a cutter-head pipeline, hopper or clamshell dredge could all be used along with barges/scows with bottom dump capability.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The project channel has a sloped bottom with authorized depth (please see Section 1 for more information). Actual depths vary widely though due to shoaling and local hydrodynamic processes.

(2) Sediment Type. Unconsolidated with sand, silt, clay and shell (please see EA section 2 and I. d. (1) above for more information).

(3) Dredged/Fill Material Movement. Dredged material placed in either the beach or nearshore placement area would become part of the littoral drift system which could augment the sand starved system.

(4) Physical Effects on Benthos. Benthic organisms would be impacted by dredging and beach or nearshore placement operations. Re-colonization should begin in less than one year. However, full recovery may require additional time.

(5) Actions to minimize impacts. Dredging, beach or nearshore placement operations would be monitored to insure that construction activities are performed in authorized project areas only and turbidity monitoring/sampling would be conducted.

b. Water Circulation, Fluctuation and Salinity Determinations.

(1) Water Column Effects.

(a) Salinity: No significant effect.
(b) Water Chemistry: No significant effect.
(c) Clarity: Turbidity would temporarily decrease clarity.
(d) Color: Turbidity would temporarily change color.
(e) Odor: No significant effect.
(f) Taste: No significant effect.
(g) Dissolved Gas Levels: No significant effect.
(h) Nutrients: No significant effect.

(2) Current Patterns and Circulation.

(a) Current Patterns and Flow: Currents in the project area are primarily tidal. Dredging and beach or nearshore placement is not expected to significantly alter current patterns or flow.
(b) Velocity: No significant effect.
(c) Stratification: No significant effect.
(d) Hydrologic Regime: Currents in the project area are primarily tidal, and the tidal regime would not be affected.

(3) Normal Water Level Fluctuations. Tides in the project area are semi-diurnal with varying levels throughout the year. The project would not affect normal water level fluctuations.

(4) Salinity Gradients. The project would not affect salinity gradients.

(5) Actions to minimize impacts. Turbidity would be monitored per the requirements of the state permit. If at any time the turbidity standard were exceeded, those activities causing the violation would cease.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. There will be a temporary increase in suspended particulates and turbidity levels in the vicinity of the placement areas.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column.

(a) Light Penetration: Light penetration would temporarily decrease during beach and nearshore placement operations.
(b) Dissolved Oxygen: Dissolved oxygen levels would not be significantly altered by this project.
(c) Toxic Metals and Organics: Sediments in the study area are not known to contain toxic metals and organics.
(d) Pathogens: This project is not expected to cause any release of pathogens.
(e) Aesthetics: Turbidity could temporarily impact the aesthetic quality of the beach and open water nearshore placement area.

(3) Effects on Biota.

(a) Primary Production, Photosynthesis: The project is not expected to have a significant impact on primary production or photosynthesis.
(b) Suspension/Filter Feeders: Turbidity could affect suspension/filter feeders, but the effects should be temporary.
(c) Sight Feeders: Sight feeders could be affected by turbidity, but the effects should be temporary.

(4) Actions to minimize impacts. As stated earlier, turbidity would be monitored per the requirements of the state permit. If at any time the turbidity standard were exceeded, those activities causing the violation would cease.

d. Contaminant Determinations. Levels of contaminants are not expected to have a significant impact on plankton, benthos, nekton, or the aquatic food web.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton: Significant effects on plankton are not anticipated.
(2) Effects on Benthos: Benthos would be impacted by the project, but benthic organisms would be expected to begin recovery within one year. However, full recovery may take a longer period of time.
(3) Effects on Nekton: Significant effects on nekton are not anticipated.
(4) Effects on Aquatic Food Web: As stated earlier, benthos would be impacted, but additional significant effects on the food web are not anticipated.
(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges: Beach or nearshore placement is not expected to have a significant impact on the nearby Charlotte Harbor estuary. This work would be performed in compliance with the Water Quality Certification issued by the state of Florida.
(b) Wetlands: The proposed work would not significantly affect wetlands.
(c) Mud Flats: Significant impacts to mud flats are not anticipated.
(d) Vegetated Shallows: Impacts to vegetated shallows are not anticipated.
(e) Coral Reefs: There are no coral reefs in the project area.
(f) Riffle and Pool Complexes: There are no riffle and pool complexes in the project area.

(6) Threatened and Endangered Species. The project would not have a significant impact on threatened and endangered species. Standard protection measures for in-water work would be used to protect listed species (sea turtles, manatees, whales, and smalltooth sawfish).

(7) Other Wildlife. Use of the nearshore placement areas could temporarily adversely impact wildlife.

(8) Actions to Minimize Impacts. Measures shall be taken to avoid or minimize impacts to threatened and endangered species as well as other wildlife (see SEA section 3).

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. This determination will be in accordance with the Water Quality Certification issued for this project.

(2) Determination of Compliance with Applicable Water Quality Standards. The work would be conducted in accordance with the Water Quality Certification issued for this project.

(3) Potential Effects on Human Use Characteristic.

(a) Municipal and Private Water Supply: No effects are anticipated.
(b) Recreational and Commercial Fisheries: Impacts to fisheries would not be significant.
(c) Water Related Recreation: Construction activities would temporarily disrupt water related recreation.
(d) Aesthetics: Construction would temporarily impact aesthetics.
(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves: The protective measures outlined in section 4 would insure avoidance and minimization of impacts to San Carlos Bay, Estero Bay Aquatic Preserve, and Charlotte Harbor Aquatic Preserve during nearshore placement. This work would be performed in compliance with the Water Quality Certification issued by the state of Florida.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. Nearshore placement operations would have impacts on the aquatic ecosystem. However, most impacts during construction should be relatively short-term. The project in conjunction with other on-going activities should not have a significant cumulative effect on the aquatic ecosystem (see SEA section 3 for more information).

h. Determination of Secondary Effects on the Aquatic Ecosystem. The proposed beach and nearshore placement would bypass sediments which are trapped by the inlet. This should augment the sand available in the littoral drift system which in turn could ease the critical erosion on the beaches there.

III. Findings of Compliance or Non-Compliance With the Restrictions on Discharge

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation: No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem: No other dredged material placement options are available for this project other than the beach and nearshore.

c. Compliance with Applicable State Water Quality Standards: Beach and nearshore placement activities would be performed in compliance with the Water Quality Certification issued by the state of Florida.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 of the Clean Water Act: The discharge operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

e. Compliance with Endangered Species Act of 1973: The proposed project would not jeopardize the continued existence of any species listed as threatened or endangered or result in the destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972: This act does not apply to this project.

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies: No effect.

(b) Recreation and Commercial Fisheries: No substantial adverse impacts are anticipated.

(c) Plankton: No substantial adverse impacts are anticipated.

(d) Fish: No substantial adverse impacts are anticipated.

(e) Shellfish: No substantial adverse impacts are anticipated.
(f) Wildlife: No substantial adverse impacts are anticipated.
(g) Special Aquatic Sites: No substantial adverse impacts are anticipated.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems: Most impacts should be relatively short-term, and not significant.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability: No significant adverse effects on aquatic ecosystem diversity, productivity and stability are anticipated.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values: Recreation and aesthetic values would be temporarily disrupted due to construction activity, but significant effects are not anticipated.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem: Measures shall be taken to minimize impacts (please see SEA section 3 for more information).

i. On the basis of the guidelines the proposed disposal site(s) for the discharge of dredged or fill material are specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

FINDING OF COMPLIANCE
FOR
FORT MYERS BEACH HARBOR MAINTENANCE DREDGING
WITH BEACH OR NEARSHORE PLACEMENT
LEE COUNTY, FLORIDA

1. No significant adaptations of the guidelines were made relative to this evaluation.

2. One beach and one nearshore placement area are available for this project. Use of either of these sites would not result in significant impacts to water level fluctuation, circulation or currents.

3. The planned disposal of dredged material at either site would not violate any applicable State water quality standards with the possible exception of turbidity. Therefore, turbidity standards would be monitored per the Water Quality Certification issued by the State of Florida. If a turbidity violation is noted, then those activities causing the violation shall be terminated. The disposal operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. The proposed disposal of dredged material will not harm any threatened or endangered species or their critical habitat, or violate protective measures for the nearby San Carlos Bay, Estero Bay Aquatic Preserve, and Charlotte Harbor Aquatic Preserve. Therefore, this project is in compliance with this act.

5. The proposed disposal of dredged material within either placement area will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on life stages of aquatic life and other wildlife, aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values will not occur.

6. Appropriate steps shall be taken to minimize potential adverse impacts of the discharge on aquatic systems.

7. On the basis of the guidelines the proposed disposal sites for the discharge of dredged material are specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

APPENDIX B – FLORIDA COASTAL MANAGEMENT PROGRAM FEDERAL CONSISTENCY DETERMINATION

FLORIDA COASTAL MANAGEMENT PROGRAM
FEDERAL CONSISTENCY DETERMINATION

FORT MYERS BEACH HARBOR MAINTENANCE DREDGING
WITH BEACH AND NEARSHORE PLACEMENT

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed plans and information will be voluntarily submitted to the State in compliance with this chapter.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the state's future. Its purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project was coordinated with various federal, state, and local agencies during the planning process. As stated in section 7 above, the Southwest Florida Regional Planning Council found the Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement – Fort Myers Beach, Lee County, Florida to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project would provide safe navigation conditions as well as reduce erosion along Estero Island beaches. Therefore, this project is consistent with the efforts of the Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed project would comply with state regulations pertaining to the above resources. The work is in compliance with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: The proposed project was coordinated with the state of Florida. The project is consistent with this chapter.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project was coordinated with the state of Florida regarding project activities in the vicinity of San Carlos Bay, Estero Bay Aquatic Preserve, and Charlotte Harbor Aquatic Preserve. The project is consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Surveys were conducted in order to determine the presence of historic properties. The project is consistent with this chapter. However, additional investigations and SHPO consultation are needed prior to use of the beach placement area.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed work could encourage commercial and recreational use which in turn could provide economic benefits to the area. This is consistent with the goals of this chapter.

9. Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project other than the Federal channel which would be temporarily impacted during construction but which would ultimately benefit from the dredging to restore authorized channel depths.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed beach and nearshore placement would not have a substantial adverse impact on saltwater living resources. Benthic organisms may be adversely affected by the work, but full recovery is expected within the placement areas due to the fact that placement there could occur every 3-5 years. Finally, the project footprint is relatively small and lies adjacent to similar habitat. Therefore, substantial impacts to the aquatic ecosystem are not anticipated. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Fish and Wildlife Conservation Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project would not have a substantial adverse impact on living land and freshwater resources.

12. Chapter 373, Water Resources. This statute addresses sustainable water management; the conservation of surface and ground waters for full beneficial use; the preservation of natural resources, fish, and wildlife; protecting public land; and promoting the health and general welfare of Floridians. The state manages and conserves water and related natural resources by determining whether activities will unreasonably consume water; degrade water quality; or adversely affect environmental values such as protected species habitat, recreational pursuits, and marine productivity. Specifically, under Part IV of Chapter 373, the DEP reviews and take agency action on environmental resource permit applications which address the construction, alteration, operation, and maintenance, of any dredging, filling and construction activities in, on, and over wetlands and other surface waters.

Response: A JCP was issued by the DEP (0158893-005-JC) for the maintenance dredging of cuts 1 through 3 with nearshore placement of the dredged material. A major permit modification request was submitted 4 June 2012 to include the remaining channel cuts 4-10 and the turning basin in this JCP. Finally, an additional modification would be needed prior to use of the beach placement area in order to comply with the intent of this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications would prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration; drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed work was coordinated with the Southwest Florida Regional Planning Council which found the Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement – Fort Myers Beach, Lee County, Florida to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project shall not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: An Environmental Assessment addressing project impacts was prepared and was reviewed by the appropriate resource agencies including DEP. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources would occur (refer to section 4 above). Water Quality Certification was obtained from the state and the project is in compliance with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; therefore, this chapter does not apply.

APPENDIX C - PERTINENT CORRESPONDENCE

DEPARTMENT OF THE ARMY
JACKSONVILLE DISTRICT CORPS OF ENGINEERS
P.O. BOX 4970
JACKSONVILLE, FLORIDA 32232-0019

REPLY TO
ATTENTION OF

Planning and Policy Division
Environmental Branch

APR 05 2017

To Whom It May Concern:

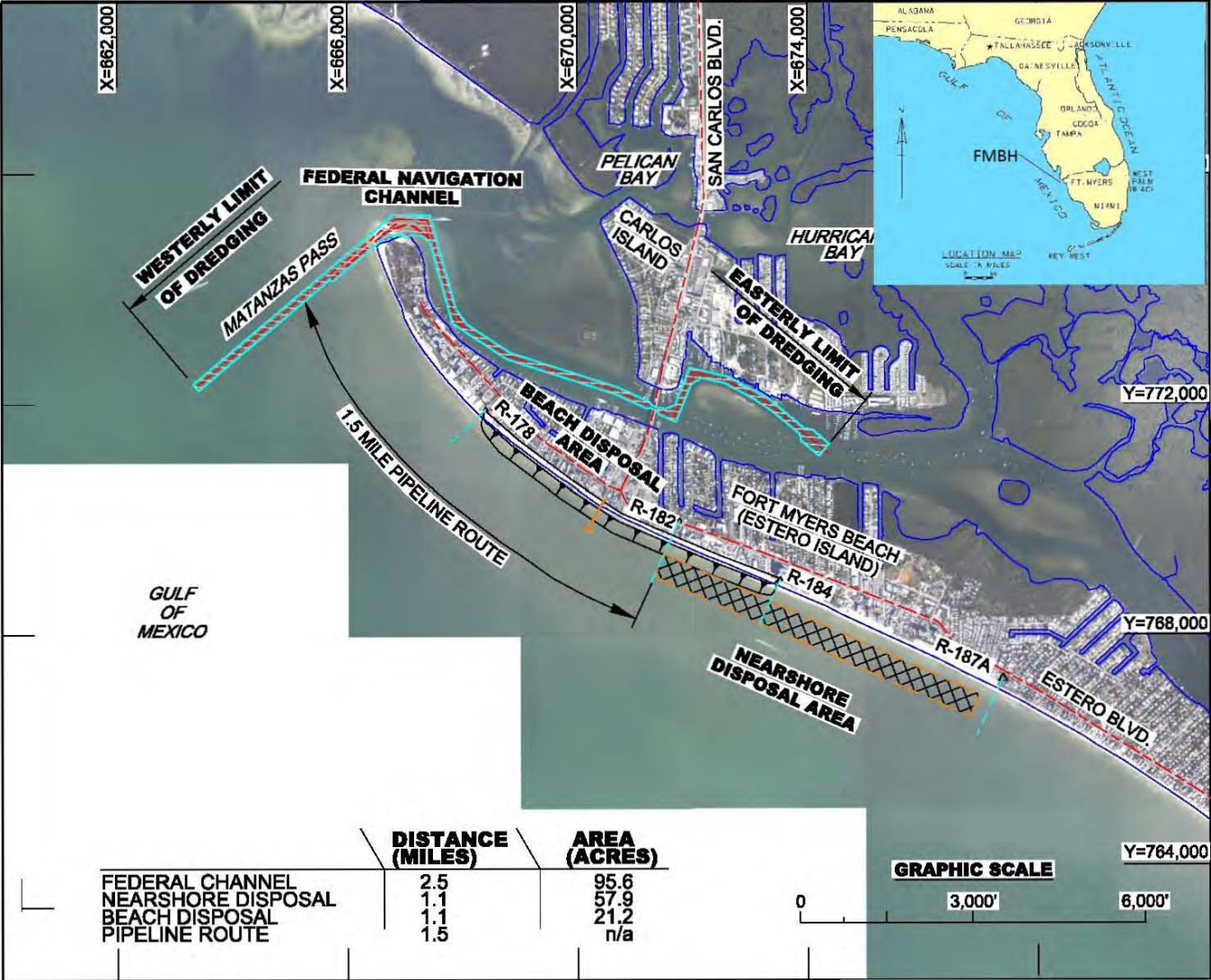
Pursuant to the National Environmental Policy Act and U.S. Army Corps of Engineers (Corps) Regulation (33 CFR 230.11), this letter constitutes the Notice of Availability of the draft Finding of No Significant Impact (FONSI) and Draft Environmental Assessment (DEA) for the operations and maintenance dredging of the Fort Myers Beach Harbor Federal navigation project. This project is located in Lee County, Florida. Enclosed is the draft FONSI and project map.

The DEA is available on the Corps, Jacksonville District website at http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_LeeCo.htm for your review and comment. In order for your comments to be considered, they must be received within thirty days from the date of this letter. Letters should be addressed to the letterhead address, to the attention of the Planning Division, Environmental Branch, Coastal Section. If you have any questions or comments, please contact Mr. Paul DeMarco by telephone at 904-232-1897, or by email at Paul.M.DeMarco@usace.army.mil.

Sincerely,

Eric P. Summa
Chief, Environmental Branch

Enclosures



	DISTANCE (MILES)	AREA (ACRES)
FEDERAL CHANNEL	2.5	95.6
NEARSHORE DISPOSAL	1.1	57.9
BEACH DISPOSAL	1.1	21.2
PIPELINE ROUTE	1.5	n/a

DRAFT FINDING OF NO SIGNIFICANT IMPACT
MAINTENANCE DREDGING WITH BEACH AND NEARSHORE PLACEMENT
FORT MYERS BEACH HARBOR FEDERAL NAVIGATION PROJECT
LEE COUNTY, FLORIDA

I have reviewed the Environmental Assessment (EA) for the proposed maintenance dredging of the federally authorized Fort Myers Beach Harbor Navigation Project in Lee County, FL. Dredged material would be placed either on the beach or in the nearshore placement areas. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, I conclude that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion are in summary:

a. The proposed action would be conducted in accordance with the Endangered Species Act, and specifically in compliance with the Regional Biological Opinion issued by the National Marine Fisheries Service (NMFS) and Statewide Programmatic Biological Opinion (SPBO) issued by the U.S. Fish and Wildlife Service (USFWS). The work would not jeopardize the continued existence of any threatened or endangered species. However, piping plover critical habitat Unit FL-25 could be altered by the proposed action. In addition, per the final critical habitat rule (Federal Register Volume 74, No. 169, page 45361) the project footprint does not contain the essential features of smalltooth sawfish critical habitat. Therefore the proposed action would not impact critical habitat for this species.

b. This project will be coordinated with the State of Florida, and all applicable water quality standards will be met.

c. Pending the State's concurrence with the Corps Coastal Zone Management Act (CZMA) consistency determination (Appendix B of the EA), the proposed action is consistent with the enforceable policies of the Florida Coastal Management Program.

d. Six cultural resources anomalies have been identified within the proposed nearshore placement area and pipeline route. All are currently located below the sediment surface and will not be impacted by sand placement over them. To further protect each of these areas the U.S. Army Corps of Engineers (Corps) will establish a minimum of a 100 foot buffer around all six potential significant anomalies. Within all buffers, no anchoring, spudding or direct outfall will be permitted. The Corps has determined that the proposed dredging will pose no adverse effect to historic properties as the dredging buffers will provide sufficient protection to identified anomalies.

e. Public benefits will be provided with unobstructed channel navigation and beach recreation.

f. Measures will be in place during construction to eliminate, reduce, or avoid adverse impacts below the threshold of significance to fish and wildlife resources including the following:

1. Maintenance dredging would occur within the footprint of the previously maintained Federal channel as would beach and nearshore placement occur within the template of previously permitted and authorized placement areas;
2. All water based activities would follow standard manatee, sea turtle and smalltooth sawfish protection measures and dredged material placement would comply with the Operations & Maintenance dredging conditions of the USFWS SPBO;
3. The Jacksonville District's Migratory Bird Protection Plan would be followed during the nesting season;
4. Prior to construction, the State must issue a Water Quality Certification and concur with the Corps consistency determination, and the State Historic Preservation Officer, NMFS and USFWS must concur with the Corps determinations for resources under their purview.

In consideration of the information summarized, I find that the proposed Federal Navigation Project, maintenance dredging of Fort Myers Beach Harbor with beach and nearshore placement of dredged material, will not significantly affect the human environment and does not require an Environmental Impact Statement. A copy of this document will be made available to the public at the following website: http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_LeeCo.htm.

_____ _____

ALFRED A. PANTANO, JR. Date
Colonel, Corps of Engineers
Commanding

Florida Department of Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Rick Scott
Governor

Jennifer Carroll
Lt. Governor

Herschel T. Vinyard Jr.
Secretary

June 7, 2012

Mr. Paul M. DeMarco
Jacksonville District, Planning Division
U. S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, FL 32232-0019

RE: U. S. Department of the Army, Jacksonville District Corps of Engineers – Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement – Fort Myers Beach, Lee County, Florida. SAI # FL201204096186C

Dear Mr. DeMarco:

The Florida State Clearinghouse has coordinated a review of the above-captioned Draft Environmental Assessment (EA) under the following authorities: Presidential Executive Order 12372; § 403.061(42), *Florida Statutes* (*F.S.*); the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended; and the National Environmental Policy Act (NEPA), 42 U.S.C. §§ 4321-4347, as amended.

The Florida Fish and Wildlife Conservation Commission (FWC) advises that in-water work associated with vessel operations and nearshore sediment placement activities could adversely affect Florida manatees, marine turtles, shorebirds and seabirds. The potential adverse impacts should be adequately offset with appropriate conservation measures. The Draft EA indicates that manatees are utilizing habitats within the area of Alternatives 1, 2 and 3 and confirms the importance of these manatee areas. The proposed maintenance dredging will also occur within the Important Manatee Area (IMA) boundary, as defined in the recommendations of the U. S. Army Corps of Engineers (USACE) Regulatory Division's Effect Determination Key for Manatees (March 2011).

Although the USACE has stated its intent to follow the U. S. Fish and Wildlife Service's Statewide Programmatic Biological Opinion (SPBO), dredging activities within IMA sites are not included in the SPBO. Therefore, the FWC recommends that the Draft EA incorporate the U. S. Fish and Wildlife Service's 2011 Standard Manatee Conditions for In-water Work for all dredging activities, include the use of wildlife observers and avoid mechanical dredging and movement of vessels during nighttime hours.

The nearshore area of Fort Myers Beach provides important foraging habitat for the loggerhead turtle and green turtle. Lee County beaches also support vital marine turtle nesting habitat from May 1st through October 31st. Disposal of dredged material in the nearshore area and sand placement on the beach may disrupt turtle resting, foraging and nesting activities if conducted immediately prior to or during the nesting season, or if escarpments, obstructions or other artificial barriers are created. The FWC therefore recommends that the conditions set forth in the SPBO be incorporated into the project design. The agency also encourages the USACE to work closely with FWC biologists on the nature, timing and sequencing of project activities to ensure the protection of marine turtles, pursuant to the Florida Marine Turtle Protection Act, § 379.2431(1), *F.S.*

Although there are no current documented nesting reports at the project site, the end points of barrier islands serve as important shorebird and seabird habitat in Florida. Both snowy plovers and piping plovers have been documented wintering at this site. Because snowy plovers, least terns and other listed species respond favorably to newly created or disturbed habitats and could be attracted to the sand placement site, the FWC recommends that if beach placement is utilized, the precautionary measures described in the attached letter be incorporated into the project to avoid take of listed shorebirds and seabirds. Please refer to the enclosed FWC letter for additional detailed comments and recommendations.

The Florida Department of Environmental Protection's (DEP) Bureau of Beaches and Coastal Systems notes that the proposed federal channel maintenance dredging with beach and nearshore placement of sediment will require a modification to Joint Coastal Permit No. 0158893-005-JC in accordance with Chapters 161, 253, 258 and 373, *F.S.* The Bureau staff report that a pre-application meeting was held with the USACE on May 17, 2012. For further information and assistance, please contact Ms. Roxane Dow at (850) 922-7852 or Roxane.Dow@dep.state.fl.us. The DEP South District Office in Fort Myers also advises that an additional or modified sovereignty submerged lands authorization may be required for portions of the project that are not included within the current public easement (*e.g.*, the turning basin).

Based on the information contained in the Draft EA and enclosed state agency comments, the state has determined that, at this stage, the proposed federal activities are consistent with the Florida Coastal Management Program (FCMP). To ensure the project's continued consistency with the FCMP, the concerns identified by our reviewing agencies must be addressed prior to project implementation. The state's continued concurrence will be based on the activities' compliance with FCMP authorities, including federal and state monitoring of the activities to ensure their continued conformance, and adequate

resolution of issues identified during this and subsequent regulatory reviews. The state's final concurrence of the project's consistency with the FCMP will be determined during the environmental permitting process in accordance with Section 373.428, *F.S.*

Thank you for the opportunity to review the Draft EA. Should you have any questions regarding this letter, please contact Ms. Lauren P. Milligan at (850) 245-2170 or Lauren.Milligan@dep.state.fl.us.

Yours sincerely,

Sally B. Mann

Sally B. Mann, Director
Office of Intergovernmental Programs

SBM/lm
Enclosures

cc: Scott Sanders, FWC
Roxane Dow, DEP, BBCS
Jennifer Nelson, DEP, South District
Rebecca Prado, DEP, CAMA

Project Information	
Project:	FL201204096186C
Comments Due:	05/21/2012
Letter Due:	06/08/2012
Description:	DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - DRAFT ENVIRONMENTAL ASSESSMENT, MAINTENANCE DREDGING FORT MYERS BEACH HARBOR WITH BEACH AND NEARSHORE PLACEMENT - FORT MYERS BEACH, LEE COUNTY, FLORIDA.
Keywords:	ACOE - DREDGE FORT MYERS BEACH HARBOR WITH BEACH/NEARSHORE PLACEMENT - LEE CO.
CFDA #:	12.107

Agency Comments:

FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION

The FWC advises that in-water work associated with vessel operations and nearshore sediment placement activities could adversely affect Florida manatees, marine turtles, shorebirds and seabirds. The potential adverse impacts should be adequately offset with appropriate conservation measures. The Draft EA indicates that manatees are utilizing habitats within the area of Alternatives 1, 2 and 3 and confirms the importance of these manatee areas. The pro¬posed maintenance dredging will also occur within the Important Manatee Area (IMA) boundary, as defined in the recommendations of the USACE Regulatory Division's Effect Determination Key for Manatees (March 2011). Although the USACE has stated its intent to follow the USFWS' Statewide Programmatic Biological Opinion (SPBO), dredging activities within IMA sites are not included in the SPBO. Therefore, the FWC recommends that the Draft EA incorporate the USFWS' 2011 Standard Manatee Conditions for In-water Work for all dredging activities, include the use of wildlife observers and avoid mechanical dredging and movement of vessels during nighttime hours. The nearshore area of Fort Myers Beach provides important foraging habitat for the loggerhead turtle and green turtle. Lee County beaches also support vital marine turtle nesting habitat from May 1st through October 31st. Disposal of dredged material in the nearshore area and sand placement on the beach may disrupt turtle resting, foraging and nesting activities if conducted immediately prior to or during the nesting season, or if escarpments, obstructions or other artificial barriers are created. The FWC therefore recommends that the conditions set forth in the SPBO be incorporated into the project design. The agency also encourages the USACE to work closely with FWC biologists on the nature, timing and sequencing of project activities to ensure the protection of marine turtles, pursuant to the Florida Marine Turtle Protection Act.

SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT

The District forwards no comments on the Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement. If you have any comments or questions, please contact Ms. Deborah Oblaczynski, Policy and Planning Analyst, at (561) 682-2544 or doblaczy@sfwmd.gov.

ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

The DEP Bureau of Beaches and Coastal Systems notes that the proposed federal channel maintenance dredging with beach and nearshore placement of sediment will require a modification to Joint Coastal Permit No. 0158893-005-JC in accordance with Chapters 161, 253, 258 and 373, F.S. Bureau staff report that a pre-application meeting was held with the USACE on May 17, 2012. For further information and assistance, please contact Ms. Roxane Dow at (850) 922-7852 or Roxane.Dow@dep.state.fl.us. The DEP South District Office in Fort Myers also advises that an additional or modified sovereignty submerged lands authorization may be required for portions of the project that are not included within the current public easement (e.g., the turning basin).

STATE - FLORIDA DEPARTMENT OF STATE

No Comment/Consistent

SW FLORIDA RPC - SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

The SWFRPC finds the Draft EA to be regionally significant and consistent with the Strategic Regional Policy Plan.

LEE -

No Comments

Florida Fish and Wildlife Conservation Commission

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(800) 955-8770 (V)

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May 31, 2012

Ms. Lauren P. Milligan
Department of Environmental Protection
Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S. 47
Tallahassee, FL 32399-3000
Lauren.Milligan@dep.state.fl.us

RE: SAI #FL201204096186C, Draft Environmental Assessment for the Maintenance Dredging of Fort Myers Beach Harbor with Beach and Nearshore Placement, U.S. Army Corps of Engineers, Lee County, Florida

Dear Ms. Milligan:

The Florida Fish and Wildlife Conservation Commission (FWC) has reviewed the above-referenced Draft Environmental Assessment for the Fort Myers Beach Harbor Maintenance Dredging and provides the following comments and recommendations for your consideration in accordance with the National Environmental Policy Act, the Fish and Wildlife Coordination Act, and the Coastal Zone Management Act, Florida Coastal Management Program (CZMA/FCMP).

Project Description

The United States Army Corps of Engineers (USACE) proposes to conduct maintenance dredging within the Fort Myers Beach Harbor, a federal navigation channel located north of Estero Island near the city of Fort Myers Beach, Lee County, Florida. The proposed maintenance dredging would occur within channel Cuts 1-10 and in the turning basin. Dredge material is proposed to either be placed along the shoreline of Fort Myers Beach (on Estero Island between Florida Department of Environmental Protection (DEP) Reference Monuments R-178 and R-184) or placed in the nearshore area of Estero Island between DEP Reference Monuments R-182 and R-187A. The Draft Environmental Assessment did not specify the dredge methodology to be used; however, it does state that the work has "been typically performed with a hydraulic cutterhead pipeline dredge." Following the maintenance dredging activity, the USACE then proposes to use a drag bar or chain to even out the navigation channel bottom. The USACE's preferred alternative is to conduct the maintenance dredging utilizing the nearshore disposal alternative.

Potentially Affected Resources and Recommended Conservation Measures

In-water work associated with vessel operations and nearshore placement activities could adversely affect the wildlife resources listed below; however, the potential adverse impacts associated with this work should be adequately offset with appropriate conservation measures.

Florida manatee:

FWC coordinated the data analysis review for this area with the U.S. Fish and Wildlife Service's (USFWS) Vero Beach Field Office. The Draft Environmental Assessment (hereafter referred to the Draft EA) states the importance of this area to manatees, and notes in the "Draft Finding of No Significant Impact" letter, paragraphs a and f2, the USACE's intention to follow the Statewide Programmatic Biological Opinion (SPBO). The SPBO and subsequent revisions addresses sand placement activities and their effects on the West Indian Manatee, sea turtles and their critical habitat.

Federally listed wildlife species are protected by the Federal Endangered Species Act of 1973, the Marine Mammal Protection Act, and the Migratory Bird Treaty Act. In addition, FWC has delegated authority over the protection of manatees under the Florida Manatee Sanctuary Act (Chapter 379.2431(2), Florida Statutes (F.S.).

The Draft EA indicates that manatees are utilizing habitats within the area of Alternatives 1, 2 and 3 and states the importance of this area for manatees. It is noted that the proposed maintenance dredging will also occur within the Important Manatee Area (IMA) boundary, as defined in the recommendations by the USACE Regulatory Division's Manatee Key. In this regard, FWC notes that Page five of the SPBO states:

> "Dredging activities within the IMA sites… are not included in this SPBO" and that "the Corps shall contact the appropriate Service Field Office for project specific conditions."

We recommend the USACE incorporate the Service's 2011 Standard Manatee Conditions for In-water work during dredging, include the use of wildlife observers, and avoid mechanical dredging and movement of vessels during nighttime hours.

Marine Turtles:

The nearshore marine habitat of Fort Myers Beach provides important foraging habitat for the loggerhead turtle and the green turtle. During the period of May 1 through October 31, Lee County beaches support vital nesting habitat essential for the recovery of the loggerhead turtle, the green turtle and the leatherback turtle. Disposal of dredged material in the nearshore marine environment has the potential to impact or disrupt resting or foraging grounds and may affect nesting distribution through the alteration of physical features in the marine environment. Sand placement may cause a disturbance to nesting turtles, including those early nesting species, such as leatherbacks and loggerhead turtles, if they are conducted immediately prior to or during the nesting season, or if escarpments, obstructions or other (artificial) barriers are created. In addition, artificial lighting from construction activities both on the beach and offshore can disorient hatchlings and nesting marine turtles, which is often fatal. We recommendation that the conditions set forth in the SPBO should be incorporated into the project design. Any incidental take of marine turtles due to the proposed project must be authorized via the USFWS and National Marine Fisheries Service (NMFS) Biological Opinions and Incidental Take Authorization, as appropriate. Also, the Florida Marine Turtle Protection Act, under Chaper 379.2431 (1), F.S., provides specific delegated authority for FWC to implement its responsibilities under the recovery plans of the USFWS for sea turtles.

This Act prohibits the take, disturbance, mutilation, destruction, transference, possession and harassment of marine turtles, nests and eggs and affords protection to their habitat. We would encourage the USACE to work closely with our biologists regarding the nature, timing, and sequencing of the project activities to ensure the protection of marine turtles. As specific maintenance dredging plans are developed, these coordination efforts will ensure that any of the potential adverse impacts associated with this work will be adequately offset with appropriate conservation measures.

Shorebirds and Seabirds:

End points of barrier islands serve as important shorebird and seabird habitat in the State of Florida. Currently, there have been no documented nesting reports at the project site; however, snowy plovers [State-designated Threatened (ST)] and black skimmers [Species of Special Concern (SSC)] are known to utilize this habitat early in the nesting season. Snowy plovers and piping plovers (Federally-designated as Threatened) have been documented wintering at this site. Snowy plovers and other listed species, such as the least tern (ST), respond favorably to newly created or disturbed habitats, and there is the potential that they may take up "residency" once sand placement activities are underway. Therefore, we recommend that if beach placement is the chosen methodology, the following provisions be incorporated into the project to avoid take of listed shorebirds and seabirds:

All conditions from the USFWS Statewide Programmatic Biological Opinion (SPBO) apply to any migratory bird protection plan. Breeding shorebird surveys must be conducted during the breeding season and by individuals (Shorebird Observer) with proven shorebird identification skills and avian survey experience. Breeding season varies by species. Most species have completed the breeding cycle by September 1, but flightless young may be present through September. The following dates are based on the best available information regarding ranges and habitat use by species in the project area:

All Gulf Coast counties: February 15 – September 1 except:
Citrus and Levy: March 15 - September 1
Dixie and Taylor: April 1 – September 1

Breeding season surveys must begin on the first day of the breeding season or 10 days prior to project commencement (including surveying activities and other pre-construction presence on the beach), whichever is later. Surveys must be conducted through August 31st or until all breeding activity has concluded, whichever is later.

Within the project area, a disturbance-free buffer zone should be established around any location where shorebirds have been engaged in breeding behavior, including territory defense. A 300-ft-wide buffer is considered adequate based on published studies. However, a smaller, site-specific buffer may be implemented upon approval by the FWC Regional Species Conservation Biologist as needed (see enclosure for contact information).

If shorebird breeding occurs within the project area, a bulletin board will be placed and maintained in the construction staging area with the location map of the construction site showing the bird breeding areas and a warning, clearly visible, stating that "NESTING BIRDS ARE PROTECTED BY LAW INCLUDING THE FLORIDA ENDANGERED

AND THREATENED SPECIES ACT AND THE STATE and FEDERAL MIGRATORY BIRD ACTS."

Summary

We find the Draft EA consistent with our authorities under Florida's Coastal Zone Management Program. As additional project information is developed or becomes available, the FWC may have additional comments regarding appropriate conservation measures. Because details and adequate offsetting measures are still forthcoming, FWC's final recommendations and CZMA consistency determination will be provided during the environmental permitting process. However, if the applicant incorporates the above recommendations, it would facilitate our review of the project and accelerate the future permitting process.

We appreciate the opportunity to review the Draft EA. If further assistance or consultation is needed, please do not hesitate to contact Ms. Jane Chabre at 850-410-5367 or by email at FWCConservationPlanningServices@MyFWC.com. If your staff has any specific questions regarding the comments contained in this letter, please contact Mary Duncan at (850) 922-4330 or by email at Mary.Duncan@myfwc.com.

Sincerely,

Scott Sanders, Director
Office of Conservation Planning Services

ss/bg/mpd
ENV 1-3-2
Fort Myers Beach Harbor Maintenance Dredging_16119_053112
Enclosure

Florida Fish and Wildlife Conservation Commission
Regional Species Biologist - Contacts for Shorebird Issues
January 2012

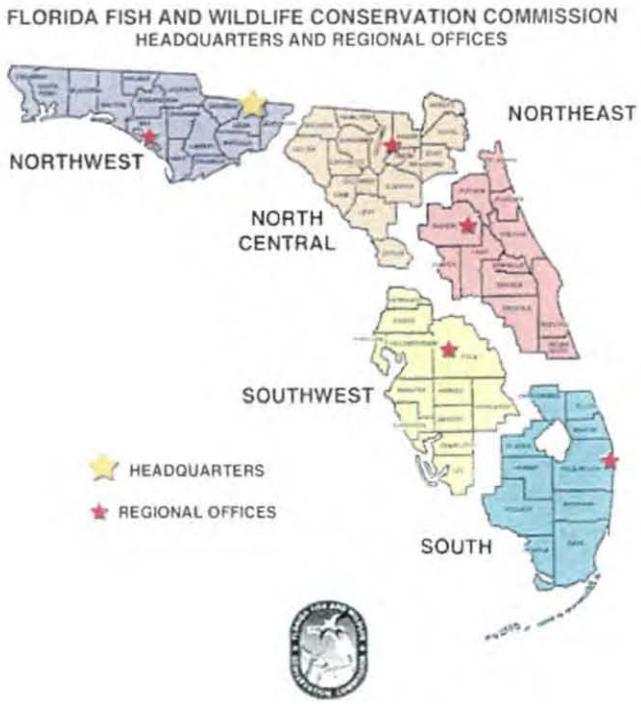
Northwest Region
Dr. John Himes
FL Fish and Wildlife Conservation Commission
3911 Highway 2321
Panama City, FL 32409-1658
(850) 265-3676

North Central Region
Dr. Terry Doonan
FL Fish and Wildlife Conservation Commission
P.O. Box 177
Olustee, FL 32072
(386) 758-0525

Northeast Region
Mr. Alex Kropp
FL Fish and Wildlife Conservation Commission
1239 S.W. 10th Street
Ocala, FL 34474-2797
(352) 732-1225

Southwest Region
Ms. Nancy Douglass
FL Fish and Wildlife Conservation Commission
3900 Drane Field Road
Lakeland, FL 33811-1299
(863) 648-3205

South Region
Mr. Ricardo Zambrano
FL Fish and Wildlife Conservation Commission
8535 Northlake Boulevard
West Palm Beach, FL 33412
(561) 625-5122



Southwest Florida Regional Planning Council

1926 Victoria Ave, Fort Myers, Florida 33901-3414 (239) 338-2550 FAX (239) 338-2560 www.swfrpc.org

May 8, 2012

Ms. Lauren P. Milligan
Department of Environmental Protection Florida State Clearinghouse
3900 Commonwealth Boulevard, M.S .47
Tallahassee, Florida 32399-3000

Re: SAI # FL201204096186C, Department of the Army, Jacksonville District Corps of Engineers – Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement - Fort Myers Beach, Lee County, Florida

Dear Ms. Milligan:

The staff of the Southwest Florida Regional Planning Council reviews various proposals, Notifications of Intent, Pre-applications, permit applications, and Environmental Impact Statements for compliance with regional goals, objectives, and policies, as determined by the Strategic Regional Policy Plan. The staff reviews such items in accordance with the Florida Intergovernmental Coordination and Review Process (Chapter 291-5, F.A.C.), and adopted regional clearinghouse procedures.

These designations determine Council staff procedure in regards to the reviewed project. The four designations are:

Less Than Regionally Significant and Consistent- No further review of the project can be expected from Council.

Less Than Regionally Significant and Inconsistent- Council does not find the project of regional importance, but will note certain concerns as part of its continued monitoring for cumulative impact within the noted goal area.

Regionally Significant and Consistent- Project is of regional importance, and appears to be consistent with Regional goals, objectives, and policies.

Regionally Significant and Inconsistent- Project is of regional importance and does not appear to be consistent with Regional goals, objectives, and policies. Council will oppose the project as submitted, but is willing to participate in any efforts to modify the project to mitigate the concerns.

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is proposing to conduct periodic maintenance dredging of the Federal Fort Myers Beach Harbor (FMBH) project (a.k.a. Matanzas Pass) in Lee County, Florida. This would include FMBH Cuts 1-10, wideners and the turning basin. It is anticipated that all of the dredged material would-be placed either on the beach between Florida Department of Environmental Protection (DEP) monuments R-178 to R-184 or in the nearshore placement area between DEP monuments R-182to R-187A. The Federal channel would be maintained to its authorized dimensions of 150-feetwide by 12-feet deep plus 2-feet of allowable over-depth at mean lower low water (MLLW) from San Carlos Bay to Matanzas Pass (FMBH Cuts 1-6) and 125-foot wide by 11-foot deep plus 2-feet of allowable over-depth at MLLW through the Pass to the upper shrimp terminals (FMBH Cuts 7-10 and the turning basin). The accumulation of sediment commonly referred to as shoaling routinely restricts the width of the project channel and reduces its depths.

FMBH is a Federal navigation channel located north of Estero Island near the City of Fort Myers Beach, Lee County, Florida. The dredge site is located within the federally authorized channel Cuts1-10 and the turning basin, in Section 24, Township 46 South, Range 23 East, which separates San Carlos Bay from the Gulf of Mexico, a Class III Water. The beach placement area is located along the shoreline of Fort Myers Beach on Estero Island between DEP Reference Monuments R-178 to R-184 in Section 24, Township 46 South, Range23 East, in Fort Myers Beach, Lee County, FL. The nearshore placement area is located in the nearshore portion of Estero Island, between DEP Reference Monuments R-182 and R-187A immediately east of the Fort Myers Beach Pier. The placement site encompasses some 57.9 acres and is located between 200 feet and700 feet water ward of the mean lower low water (MLLW) of Fort Myers Beach in the Gulf of Mexico. The estimated capacity of the nearshore placement area is approximately 335,000 cubic yards.

The Corps has reviewed the Environmental Assessment (EA) for the proposed maintenance dredging of the federally authorized Fort Myers Beach Harbor Navigation Project in Lee County, Florida. Based on information analyzed in the EA, reflecting pertinent information obtained from agencies having jurisdiction by law and/or special expertise, the Corps has concluded that the proposed action will not significantly impact the quality of the human environment and does not require an Environmental Impact Statement. Reasons for this conclusion include:

a. The proposed action would be conducted in accordance with the Endangered Species Act, and specifically in compliance with the Regional Biological Opinion issued by the National Marine Fisheries Service (NMFS) and Statewide Programmatic Biological Opinion (SPBO) issued by the U.S. Fish and Wildlife Service (USFWS). The work would not jeopardize the continued existence of any threatened or endangered species. However, piping plover

critical habitat Unit FL-25 could be altered by the proposed action. In addition, per the final critical habitat rule (Federal Register Volume 74, No. 169, page 45361) the project footprint does not contain the essential features of small tooth sawfish critical habitat. Therefore the proposed action would not impact critical habitat for this species.

b. This project will be coordinated with the State of Florida, and all applicable water quality standards will be met.

c. Pending the State's concurrence with the Corps Coastal Zone Management Act (CZMA) consistency determination (Appendix B of the EA), the proposed action is consistent with the enforceable policies of the Florida Coastal Management Program.

d. Six cultural resources anomalies have been identified within the proposed nearshore placement area and pipeline route. All are currently located below the sediment surface and will not be impacted by sand placement over them. To further protect each of these areas the Corps will establish a minimum of a 100 foot buffer around all six potential significant anomalies. Within all buffers, no anchoring, spudding or direct outfall will be permitted. The Corps has determined that the proposed dredging will pose no adverse effect to historic properties as the dredging buffers will provide sufficient protection to identified anomalies.

e. Public benefits will be provided with unobstructed channel navigation and beach recreation.

f. Measures will be in place during construction to eliminate, reduce, or avoid adverse impacts below the threshold of significance to fish and wildlife resources including the following:

1. Maintenance dredging would occur within the footprint of the previously maintained Federal channel as would beach and nearshore placement occur within the template of previously permitted and authorized placement areas;

2. All water based activities would follow standard manatee, sea turtle and small tooth sawfish protection measures and dredged material placement would comply with the Operations & Maintenance dredging conditions of the USFWS SPBO;

3. The Jacksonville District's Migratory Bird Protection Plan would be followed during the nesting season;

4. Prior to construction, the State must issue a Water Quality Certification and concur with the Corps consistency determination, and the State Historic Preservation Officer, NMFS and USFWS must concur with the Corps determinations for resources under their purview.

The Southwest Florida Regional Planning Council finds the Draft Environmental Assessment, Maintenance Dredging Fort Myers Beach Harbor with Beach and Nearshore Placement - Fort Myers Beach, Lee County, Florida to be **regionally significant and consistent** with the Strategic Regional Policy Plan and the State Comprehensive Plan.

If you have specific questions about the content of this letter, please contact Mr. Jim Beever directly at (239) 338-2550 ext 224, e-mail jbeever@swfrpc.org.

Sincerely,

SOUTHWEST FLORIDA REGIONAL PLANNING COUNCIL

Margaret Wuerstle

Margaret Wuerstle, AICP
Executive Director

CC: Mr. Paul DeMarco
Planning Division
Environmental Branch
Coastal Section
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

LEE
SCH-Corps
2012-1573

COUNTY: LEE

DATE: 4/9/2012
COMMENTS DUE DATE: 5/21/2012
CLEARANCE DUE DATE: 6/8/2012
SAI#: FL201204096186C

MESSAGE:

STATE AGENCIES	WATER MNGMNT. DISTRICTS	OPB POLICY UNIT	RPCS & LOC GOVS
ENVIRONMENTAL PROTECTION	SOUTH FLORIDA WMD		
FISH and WILDLIFE COMMISSION			
X STATE			

The attached document requires a Coastal Zone Management Act/Florida Coastal Management Program consistency evaluation and is categorized as one of the following:

- _ **Federal Assistance to State or Local Government (15 CFR 930, Subpart F). Agencies are required to evaluate the consistency of the activity.**
- X **Direct Federal Activity (15 CFR 930, Subpart C). Federal Agencies are required to furnish a consistency determination for the State's concurrence or objection.**
- _ **Outer Continental Shelf Exploration, Development or Production Activities (15 CFR 930, Subpart E). Operators are required to provide a consistency certification for state concurrence/objection.**
- _ **Federal Licensing or Permitting Activity (15 CFR 930, Subpart D). Such projects will only be evaluated for consistency when there is not an analogous state license or permit.**

Project Description:

DEPARTMENT OF THE ARMY, JACKSONVILLE DISTRICT CORPS OF ENGINEERS - DRAFT ENVIRONMENTAL ASSESSMENT, MAINTENANCE DREDGING FORT MYERS BEACH HARBOR WITH BEACH AND NEARSHORE PLACEMENT - FORT MYERS BEACH, LEE COUNTY, FLORIDA.

To: Florida State Clearinghouse

AGENCY CONTACT AND COORDINATOR (SCH)
3900 COMMONWEALTH BOULEVARD MS-47
TALLAHASSEE, FLORIDA 32399-3000
TELEPHONE: (850) 245-2161
FAX: (850) 245-2190

EO. 12372/NEPA

- ☑ No Comment
- ☐ Comment Attached
- ☐ Not Applicable

Federal Consistency

- ☑ No Comment/Consistent
- ☐ Consistent/Comments Attached
- ☐ Inconsistent/Comments Attached
- ☐ Not Applicable

From:

Division/Bureau: Historical Resources

Reviewer: Michael Hart

Date: 5/10/12

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
South Florida Ecological Services Office
1339 20th Street
Vero Beach, Florida 32960

August 21, 2012

Colonel Alan M. Dodd
District Commander
U.S. Army Corps of Engineers
Post Office Box 4970
Jacksonville, Florida 32232-0019

Service Federal Activity Code: 41420-2009-FA-0132
Date Received: March 15, 2012
Formal Consultation Initiation Date: May 24, 2012
Project: Matanzas Pass Maintenance Dredging
County: Lee

Dear Colonel Dodd:

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion to the U.S. Army Corps of Engineers (Corps) based on our review of a proposal to maintenance dredge Matanzas Pass with placement of beach compatible dredge material either along the shoreline or in the nearshore water adjacent to Estero lsland, Lee County, Florida. This document will address potential effects of the proposed project on the piping plover (*Charadrius melodus*) and its critical habitat, the threatened loggerhead sea turtle (*Caretta caretta*), endangered leatherback sea turtle (*Dermochelys coriacea*), endangered green sea turtle (*Chelonia mydas*), endangered hawksbill sea turtle (*Eretmochelys imbricata*), endangered Kemp's ridley sea turtle (*Lepidochelys kempii*), endangered West Indian manatee (*Trichechus manatus*), and beach mice. This document is provided in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act) (87 Stat. 884; 16 U.S.C. 1531 *et seq.*).

In the Corps' letter dated March 13, 2012, the Corps determined the proposed project "may affect, but is not likely to adversely affect", the piping plover and requested initiation of informal consultation. Given that approximately 3.2 acres of piping plover critical habitat may be directly affected by the action, the Service did not concur with the Corps' determination. Upon our request, the Corps changed their determination to "may affect" and we initiated formal consultation on this species.

This Biological Opinion is based on information provided in the Corps' letter dated March 13, 2012, draft environmental assessment, and correspondence with the Corps, National Oceanic Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries), and the Florida Fish and Wildlife Conservation Commission (FWC). A complete administrative record of this consultation is on file at the South Florida Ecological Services Office, Vero Beach, Florida.

FISH AND WILDLIFE RESOURCES

Hardbottom Reef Habitat and Seagrasses

The proposed maintenance dredging project could affect approximately 96 acres of previously dredged unconsolidated substrate. Prior to the 2009 emergency dredging event, underwater surveys were conducted on October 22 and 23, 2008, to determine the presence or absence of submerged aquatic vegetation and, if present, to collect qualitative measurements on the located seagrass communities. The surveys identified the presence of seagrasses in generally the same area identified in the 1999 FWC and Florida Marine Research Institute Geographic Information System data layer. Only barren sand and mud habitats and, to a much lesser extent, areas vegetated with the marine green alga (*Caulerpa prolifera*), were identified within the dredging template. During the 2009 emergency maintenance dredging event, no seagrass colonies were encountered within Cuts 1 and 2A of the 2.5 mile channel, nor in the advanced maintenance area. The most recent submerged aquatic natural resources survey within the project area was conducted during the summer of 2011. The results documented several small seagrass colonies adjacent to Cuts 8 and 9, as well as one along the pipeline corridor. These seagrass colonies were primarily composed of shoal grass (*Halophila wrightii*) and to a lesser extent turtle grass (*Thalassia testudinum*). These seagrass colonies are not within the Federal channel; rather, they are present on the outer-most edge of the 50-foot buffer study area where no dredging is proposed. Based on past surveys, the fact the substrate in the dredge template is naturally dynamic and unconsolidated, and the area has been previously dredged, direct effects to seagrass resources are not anticipated

A survey for hardbottom reef habitat and seagrasses was not conducted in the nearshore sand placement area located along the western portion of Estero Island between the Florida Department of Environmental Protection (DEP) reference monuments R-182 and R-187A. However, the placement area is highly dynamic and not suitable for seagrasses. In addition, the DEP historical records did not reveal any evidence of seagrasses or hardbottom reef habitat within the nearshore fill template. Therefore, effects to seagrass or hardbottom reef habitat is not anticipated. The Corps will continue to consult with the NOAA Fisheries whom will assess all potential effects to hardbottom reef habitat and seagrasses within the dredge template, sand placement fill templates (nearshore and beach), and shoreline downdrift area.

Consultation History

On March 15, 2012, the Service received a copy of the Corps' letter dated March 13, 2012, and draft environmental assessment concerning the proposed Matanzas Pass maintenance dredging and sand placement project, Lee County, Florida.

On May 23, 2012, the Service emailed the Corps a request for additional information and received the requested additional information from the Corps.

On May 24, 2012, the Service completed their review of the proposed project and initiated formal consultation with the Corps concerning the potential effects of the proposed project on piping plovers and designated critical habitat.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Corps and Sponsor propose to conduct periodic maintenance dredging of accreted sand, shell and sediment from the Federal channel at Matanzas Pass, Estero Island, Lee County, Florida (Figure 1). The dredging action will take place within the authorized Federal channel. Minimum depths recorded within the Federal channel are less than 0 feet causing navigation problems for commercial and recreational vessels. Vessels are currently forced outside the authorized channels in search of deeper water, waiting for high tides, or prop dredging through the channel. In addition, the degraded conditions in the entrance channel have contributed to increased potential for collisions, and interfere with the ability of the U.S. Coast Guard to provide adequate emergency response.

The Federal channel will be maintained to its authorized dimensions of 150 feet wide by 12 feet deep, plus 2 feet of allowable over-depth at mean lower low water (MLLW) from San Carlos Bay to Matanzas Pass (FMBH Cuts 1-6) and 125-foot wide by 11-foot deep plus 2-feet of allowable over-depth at MLLW through the Pass to the upper shrimp terminals (FMBH Cuts 7-10 and the turning basin). Approximately 120,000 – 150,000 cubic yards (cy) of material will be dredged most likely using a cutterhead dredge with pipeline capability. All dredge material will be pumped via pipeline and placed in a nearshore placement area located along the western portion of Estero Island between DEP reference monuments R-182 to R-187, or along the beach between DEP reference monument R-178 and R-184 (approximately 1.1 miles) (Figure 1). Deposition within the nearshore placement area is the preferred alternative due to the need for inlet sediment bypassing of quality dredge material to the critically eroded beach and due to the need to perform additional cultural resource investigations prior to using the beach placement area. However, if placed along the beach, the beach compatible dredge material will be pumped onto the beach and reworked using heavy equipment to the permitted design fill profile. All sand placed within the beach fill template must be approved by the DEP and meet all requirements as outlined in the Florida Administrative Code subsection 62B-41.007. The intent of the proposed maintenance dredging action is to restore navigation depth and to remove existing hazards to commercial vessel operations, and U.S. Coast Guard navigation, and search and rescue operations.

All beach corridors, staging area, and pipeline corridors will be selected to avoid affects to upland habitat. Construction vehicles and equipment must traverse or be stored within these designated areas, corridors, and/or within the pipeline corridor. In addition, all construction pipes will be placed parallel to the shoreline and positioned as far landward as possible up to the vegetated dune line. Existing vegetated habitat at these sites and corridors shall be protected to the maximum extent practicable. Any affected vegetation at each of these sites and corridors shall be restored to preconstruction conditions. In addition, if heavy equipment and vehicles are required to traverse the dry beach above the mean high water line, the path will be tilled to a depth of 3 feet to avoid compaction effects prior to the following sea turtle nesting season.

The next maintenance dredging event is scheduled to occur in late summer 2012 and is expected to take approximately 2 to 6 months to complete. Dredging and sand placement activities will

take place during both daytime and nighttime hours. Approximately 120,000 - 150,000 cy of dredged material is expected to be dredged approximately once every 3-5 years.

The Corps or Sponsor will quantify the pre- and postdredging area of piping plover Critical Habitat Unit FL-25. In addition, the area of piping plover critical habitat will be measured annually for a total of 5 years, after which the maximum area of piping plover critical habitat directly affected by the project will be determined. Also, the quality of the habitat will be assessed based on whether or not the habitat is located in Critical Habitat Unit FL-25 and located along undeveloped shoreline, the amount of human use and disturbance, and any reported use of the habitat by piping plovers. The Corps and Sponsor will use the above stated information to determine the acreage of critical habitat lost and to examine beneficial use of dredge material during future maintenance dredging events in providing piping plover habitat not fully offset by the original project conducted in 2009. In addition, the Corps and Sponsor will consider creation of intertidal habitat suitable as piping plover habitat in proximity to Critical Habitat Unit FL-25, associated with other Federal projects, as potentially offsetting the loss of 3.2 acres of Critical Habitat Unit FL-25 associated with the proposed project.

Action area

The action area is defined as all areas to be affected directly or indirectly by the action and not merely the immediate area involved in the action. The Service identifies the action area to include the dredge template, nearshore disposal area, beach fill template (1.1 miles), 3.2 acres of Critical Habitat Unit FL-25 in Bowditch Point Regional Park (Park), pipeline corridor, beach corridors, pipeline corridor, staging areas, and shoreline downdrift (0.5 mile). The project is located along the Gulf of Mexico, Lee County, Florida at latitude 26.4654 and longitude -81.9673.

STATUS OF THE SPECIES/CRITICAL HABITAT

Species/critical habitat description

The piping plover is a small, pale sand-colored shorebird, about 7 inches long with a wingspan of about 15 inches (Palmer 1967). On January 10, 1986, the piping plover was listed as endangered in the Great Lakes watershed and threatened elsewhere within its range, including migratory routes outside of the Great Lakes watershed and wintering grounds (Service 1985). Piping plovers were listed principally because of habitat destruction and degradation, predation, and human disturbance. Protection of the species under the Act reflects the species' precarious status range-wide. Three separate breeding populations have been identified, each with its own recovery criteria: the northern Great Plains (threatened), the Great Lakes (endangered), and the Atlantic Coast (threatened). The piping plover winters in coastal areas of the U.S. from North Carolina to Texas, and along the coast of eastern Mexico and on Caribbean islands from Barbados to Cuba and the Bahamas (Haig and Elliott-Smith 2004). Piping plover subspecies are phenotypically indistinguishable, and most studies in the nonbreeding range report results without regard to breeding origin. Although a recent analysis shows strong patterns in the wintering distribution of piping plovers from different breeding populations, partitioning is not complete and major information gaps persist. Therefore, information summarized here pertains to the species as a whole (*i.e.*, all three breeding populations), except where a particular breeding population is specified.

Critical habitat

The Service has designated critical habitat for the piping plover on three occasions. Two of these designations protected different piping plover breeding populations. Critical habitat for the Great Lakes breeding population was designated May 7, 2001 (66 Federal Register [FR] 22938, Service 2001a), and critical habitat for the northern Great Plains breeding population was designated September 11, 2002 (67 FR 57637, Service 2002). The Service designated critical habitat for wintering piping plovers on July 10, 2001 (66 FR 36038, Service 2001b). Wintering piping plovers may include individuals from the Great Lakes and northern Great Plains breeding populations as well as birds that nest along the Atlantic Coast. The three separate designations of piping plover critical habitat demonstrate diversity of constituent elements between the two breeding populations as well as diversity of constituent elements between breeding and wintering populations.

Designated wintering piping plover critical habitat originally included 142 areas (the rule states 137 units; this is an error) encompassing approximately 1,793 miles of mapped shoreline and 165,211 acres of mapped areas along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. Since the designation of wintering critical habitat, 19 units (TX- 3, 4, 7-10, 14-19, 22, 23, 27, 28, and 31-33) in Texas have been vacated and remanded back to the Service for reconsideration by Court order (*Texas General Land Office vs. U.S. Department of Interior* [Case No. V-06-CV-00032]). On May 19, 2009, the Service published a final rule designating 18 revised critical habitat units in Texas, totaling approximately 139,029 acres (74 FR 23476).

The Courts vacated and remanded back to the Service for reconsideration, four units in North Carolina (*Cape Hatteras Access Preservation Alliance vs. U.S. Department of Interior* [344 F. Supp. 2d 108 D.D.C. 2004]). The four critical habitat units vacated were NC-1, 2, 4, and 5, and all occurred within Cape Hatteras National Seashore. A revised designation for these four units was published on October 21, 2008 (73 FR 62816). On February 6, 2009, Cape Hatteras Access Preservation Alliance and Dare and Hyde Counties, North Carolina, filed a legal challenge to the revised designation. A final decision has not been made on the North Carolina challenge to date.

The primary constituent elements (PCEs) for piping plover wintering habitat are those biological and physical features that are essential to the conservation of the species. The PCEs are those habitat components that support foraging, roosting, and sheltering, and the physical features necessary for maintaining the natural processes that support these habitat components. PCEs typically include those coastal areas that support intertidal beaches and flats, and associated dune systems and flats above annual high tide (Service 2001a). PCEs of wintering piping plover critical habitat include sand or mud flats or both with no or sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting piping plovers (Service 2001a). Important components of the beach/dune ecosystem include surf-cast algae, sparsely vegetated back beach and salterns, spits, and washover areas. Washover areas are broad, unvegetated zones, with little or no topographic relief, that are formed and maintained by the action of hurricanes, storm surge, or other extreme wave action. The units designated as critical habitat are those areas that have consistent use by piping plovers and that best meet the biological needs of the species. The amount of wintering habitat included in the designation appears sufficient to support future recovered populations, and the existence of this habitat is essential to the conservation of the

species. Additional information on each specific unit included in the designation can be found at 66 FR 36038 (Service 2001a).

Feeding areas

Plovers forage on moist substrate features such as intertidal portions of ocean beaches, washover areas, mudflats, sand flats, algal flats, shoals, wrack lines, sparse vegetation, and shorelines of coastal ponds, lagoons, and ephemeral pools, and adjacent to salt marshes (Gibbs 1986; Zivojnovich 1987; Nicholls 1989; Coutu et al. 1990; Nicholls and Baldassarre 1990a; Nicholls and Baldassarre 1990b; Hoopes et al. 1992; Loegering 1992; Goldin 1993a; Elias-Gerken 1994; Wilkinson and Spinks 1994; Zonick 1997; Service 2001a). Studies have shown that the relative importance of various feeding habitat types may vary by site (Gibbs 1986; Coutu et al. 1990; McConnaughey et al. 1990; Loegering 1992; Goldin 1993a; Hoopes 1993). Cohen et al. (2008) documented more abundant prey items and biomass on sound island and sound beaches than the ocean beach. EAI (2009) observed that during piping plover surveys conducted at St Lucie Inlet, Martin County, Florida, intertidal mudflats and/or shallow subtidal grassflats appeared to have greater value as foraging habitat than the unvegetated intertidal areas of a flood shoal.

Foraging/food

Behavioral observations of piping plovers on the wintering grounds suggest that they spend the majority of their time foraging (Nicholls and Baldassarre 1990a; Drake 1999a, 1999b). Feeding activities may occur during all hours of the day and night (Staine and Burger 1994; Zonick 1997), and at all stages in the tidal cycle (Goldin 1993a; Hoopes 1993). Wintering plovers primarily feed on invertebrates such as polychaete marine worms, various crustaceans, fly larvae, beetles, and occasionally bivalve mollusks (Bent 1929; Cairns 1977; Nicholls 1989; Zonick and Ryan 1996) found on top of the soil or just beneath the surface.

Habitat

Wintering piping plovers prefer coastal habitats that include sand spits, islets (small islands), tidal flats, shoals (usually flood tidal deltas), and sandbars that are often associated with inlets (Harrington 2008). Sandy mud flats, ephemeral pools, and overwash areas are also considered primary foraging habitats. These substrate types have a richer infauna than the foreshore of high energy beaches and often attract large numbers of shorebirds (Cohen et al. 2008). Wintering plovers are dependent on a mosaic of habitat patches and move among these patches depending on local weather and tidal conditions (Nicholls and Baldassarre 1990a).

Recent study results in North Carolina, South Carolina, and Florida, complement information from earlier investigations in Texas and Alabama (summarized in the 1996 Atlantic Coast and 2003 Great Lakes Recovery Plans) regarding habitat use patterns of piping plovers in their coastal migration and wintering range. As documented in Gulf Coast studies, nonbreeding piping plovers in North Carolina primarily used sound (bay or bayshore) beaches and sound islands for foraging and ocean beaches for roosting, preening, and being alert (Cohen et al. 2008). The probability of piping plovers being present on the sound islands increased with increasing exposure of the intertidal area (Cohen et al. 2008). Maddock et al. (2009) observed shifts to roosting habitats and behaviors during high-tide periods in South Carolina.

Seven years of surveys, two to three times per month, along 8 miles of Gulf of Mexico (ocean-facing) beach in Gulf County, Florida, cumulatively documented nearly the entire area used at various times by roosting or foraging piping plovers. Birds were reported using the midbeach to the intertidal zone. Numbers ranged from 0 to 39 birds on any given survey day (Eells unpublished data).

As observed in Texas studies, Lott et al. (2009) identified bay beaches (bay shorelines as opposed to ocean-facing beaches) as the most common landform used by foraging piping plovers in southwest Florida. However in northwest Florida, Smith (2007) reported landform use by foraging piping plovers about equally divided between Gulf of Mexico (ocean-facing) and bay beaches. Exposed intertidal areas were the dominant foraging substrate in South Carolina (accounting for 94 percent of observed foraging piping plovers; Maddock et al. 2009) and in northwest Florida (96 percent of foraging observations; Smith 2007). In southwest Florida, Lott et al. (2009) found approximately 75 percent of foraging piping plovers on intertidal substrates.

Atlantic Coast and Florida studies highlighted the importance of inlets for nonbreeding piping plovers. Almost 90 percent of roosting piping plovers at ten coastal sites in southwest Florida were on inlet shorelines (Lott et al. 2009). Piping plovers were among seven shorebird species found more often than expected ($p = 0.0004$; Wilcoxon Test Scores) at inlet locations versus noninlet locations in an evaluation of 361 International Shorebird Survey sites from North Carolina to Florida (Harrington 2008).

Bird populations in the Park are monitored by volunteers. The number of birds, by species, is submitted annually to http://ebird.org (Lee County 2008). Launched in 2002, by the Cornell Lab of Ornithology and National Audubon Society, eBird provides data concerning bird abundance and distribution at a variety of spatial and temporal scales. eBird is sponsored in part by several Service programs, research groups, non-government offices, and the University of the Virgin Islands. The number of piping plovers reported in the Park between 2005 and 2009, ranged from 1 to 7, and from 2 to 15 during 2011. In addition, piping plover PCEs are present throughout the proposed action area.

Recent geographic analysis of piping plover distribution on the upper Texas coast noted major concentration areas at the mouths of rivers, washover passes (low, sparsely vegetated barrier island habitats created and maintained by temporary, storm-driven water channels), and major bay systems (Arvin 2008). Earlier studies in Texas have drawn attention to washover passes, which are commonly used by piping plovers during periods of high bayshore tides and during the spring migration period (Zonick 1997; Zonick 2000). Elliott-Smith et al. (2009) reported piping plover concentrations on exposed seagrass beds and oyster reefs during seasonal low water periods in 2006.

The effects of dredge material deposition merit further study. Drake et al. (2001) concluded conversion of southern Texas mainland bayshore tidal flats to dredged material impoundments results in a net loss of habitat for wintering piping plovers because impoundments eventually convert to upland habitat not utilized by piping plovers. Zonick et al. (1998) reported dredged material placement areas along the intracoastal waterway in Texas were rarely used by piping plovers, and noted concern that dredge islands block wind-driven water flows which are critical

to maintaining important shorebird habitats. By contrast, most of the sound islands used by foraging piping plovers at Oregon Inlet were created by the Corps through deposition of dredged material in the subtidal bay bottom, with the most recent deposition ranging from 28 to less than 10 years prior to the study (Cohen et al. 2008).

Mean home range size (95 percent of locations) for 49 radio-tagged piping plovers in southern Texas in 1997 through 1998 was 3,113 acres, mean core area (50 percent of locations) was 717 acres, and the mean linear distance moved between successive locations (1.97 $\pm$ 0.04 days apart) averaged across seasons, was 2.1 miles (Drake 1999a; Drake et al. 2001). Seven radio-tagged piping plovers used a 4,967-acre area (100 percent minimum convex polygon) at Oregon Inlet in 2005 and 2006, and piping plover activity was concentrated in 12 areas totaling 544 acres (Cohen et al. 2008). Noel and Chandler (2008) observed high fidelity of banded piping plovers along a 0.62 and 2.8 mile section of beach on Little St. Simons Island, Georgia.

Migration

Plovers depart their breeding grounds for their wintering grounds between July and late August, but southward migration extends through November. Piping plovers use habitats in Florida primarily from July 15 through May 15. Both spring and fall migration routes of Atlantic Coast breeders are believed to occur primarily within a narrow zone along the Atlantic Coast (Service 1996). The pattern of both fall and spring counts at many Atlantic Coast sites demonstrates that many piping plovers make intermediate stopovers lasting from a few days up to 1 month during their migrations (Noel and Chandler 2005; Stucker and Cuthbert 2006). Some midcontinent breeders travel up or down the Atlantic Coast before or after their overland movements (Stucker and Cuthbert 2006). Use of inland stopovers during migration is also documented (Pompei and Cuthbert 2004). The source breeding population of a given wintering individual cannot be determined in the field unless it has been banded or otherwise marked. Information from observation of color-banded piping plovers indicates that the winter ranges of the breeding populations overlap to a significant degree. See the *Status and Distribution* section for additional information pertaining to population distribution on the wintering grounds. While piping plover migration patterns and needs remain poorly understood and occupancy of a particular habitat may involve shorter periods relative to wintering, information about the energetics of avian migration indicates that this might be a particularly critical time in the species' life cycle.

Natural protection

Cryptic coloration is a primary defense mechanism for piping plovers where nests, adults, and chicks all blend in with their typical beach surroundings. Piping plovers on wintering and migration grounds respond to intruders (*e.g.*, pedestrian, avian and mammalian) usually by squatting, running, and flushing (flying).

Roosting

Several studies identified wrack (organic material including seaweed, seashells, driftwood, and other materials deposited on beaches by tidal action) as an important component of roosting

habitat for nonbreeding piping plovers. Lott et al. (2009) found greater than 90 percent of roosting piping plovers in southwest Florida in old wrack with the remainder roosting on dry sand. In South Carolina, 18 and 45 percent of roosting piping plovers were in fresh and old wrack, respectively. The remainder of roosting birds used intertidal habitat (22 percent), backshore (defined as the zone of dry sand, shell, cobble and beach debris from the mean high water line up to the toe of the dune; 8 percent), washover (2 percent), and ephemeral pools (1 percent) (Maddock et al. 2009). Thirty percent of roosting piping plovers in northwest Florida were observed in wrack substrates with 49 percent on dry sand and 20 percent using intertidal habitat (Smith 2007). In Texas, seagrass debris (bayshore wrack) was an important feature of piping plover roosting sites (Drake 1999a). Mean abundance of two other plover species in California, including the listed western snowy plover, was positively correlated with an abundance of wrack during the nonbreeding season (Dugan et al. 2003).

Life history

Piping plovers live an average of 5 years, although studies have documented birds as old as 11 (Wilcox 1959) and 15 years. Piping plover breeding activity begins in mid-March when birds begin returning to their nesting areas (Coutu et al. 1990; Cross 1990; Goldin et al. 1990; MacIvor 1990; Hake 1993). Plovers are known to begin breeding as early as 1 year of age (MacIvor 1990; Haig 1992); however, the percentage of birds that breed in their first adult year is unknown. Piping plovers generally fledge only a single brood per season, but may re-nest several times if previous nests are lost.

The most consistent finding in the various population viability analyses conducted for piping plovers (Ryan et al. 1993; Melvin and Gibbs 1996; Plissner and Haig 2000; Wemmer et al. 2001; Larson et al. 2002; Amirault et al. 2005; Calvert et al. 2006; Brault 2007) indicates even small declines in adult and juvenile survival rates will cause increases in extinction risk. A banding study conducted between 1998 and 2004 in Atlantic Canada concluded lower return rates of juvenile (first year) birds to the breeding grounds than was documented for Massachusetts (Melvin and Gibbs 1994), Maryland (Loegering 1992), and Virginia (Cross 1996) breeding populations in the mid-1980s and very early 1990s. This is consistent with failure of the Atlantic Canada population to increase in abundance despite high productivity (relative to other breeding populations) and extremely low rates of dispersal to the U.S. over the last 15 plus years (Amirault et al. 2005). This suggests maximizing productivity does not ensure population increases.

Efforts to partition survival within the annual cycle are beginning to receive more attention, but current information remains limited. Drake et al. (2001) observed no mortality among 49 radio-tagged piping plovers (total of 2,704 transmitter days) in Texas in 2007 and 2008. Cohen et al. (2008) documented no mortality of 7 radio-tagged wintering piping plovers at Oregon Inlet from December 2005 to March 2006. They speculate their high survival rate was attributed to plover food availability much of the day as well as the low occurrence of days below freezing and infrequent wet weather. Analysis of South Carolina resighting data for 87 banded piping plovers (78 percent Great Lakes breeders) in 2006 and 2007, and 2007 and 2008, found 100 percent survival from December to April (Cohen 2009). However, of those birds, one unique and one nonuniquely banded piping plover were seen in the first winter and resighted multiple times in

the second fall at the same location, but not seen during the second winter. Whether these two birds died in the fall or shifted their wintering location is unknown (Maddock et al. 2009). Noel et al. (2007) inferred two winter (November to February) mortalities among 21 banded (but not radio-tagged) overwintering piping plovers in 2003 through 2004, and 9 mortalities among 19 overwintering birds during the winter of 2004 through 2005 at Little St. Simons Island, Georgia. Noel et al. (2007) inferred mortality if a uniquely banded piping plover with multiple November to February sightings on the survey site disappeared during that time and was never observed again in either its nonbreeding or breeding range. Note that most of these birds were from the Great Lakes breeding population, where detectability during the breeding season is very high. LeDee (2008) found higher apparent survival rates during breeding and southward migration than during winter and northward migration for 150 adult (*i.e.*, after-hatch year) Great Lakes piping plovers. "Apparent survival" does not account for permanent emigration. If marked individuals leave a survey site, apparent survival rates will be lower than true survival. If a survey area is sufficiently large, such that emigration out of the site is unlikely, apparent survival will approach true survival.

Mark-recapture analysis of resightings of uniquely banded piping plovers from seven breeding areas by Roche et al. (2009) found apparent adult survival declined in four populations and did not increase over the life of the studies (data were analyzed for 3 to 11 years per breeding area between 1998 and 2008). Some evidence of correlation in year-to-year fluctuations in annual survival of Great Lakes and eastern Canada populations, both of which winter primarily along the southeastern U.S. Atlantic Coast, suggests shared over-wintering and/or migration habitats may influence annual variation in survival. Further concurrent mark-resighting analysis of color-banded individuals across piping plover breeding populations has the potential to shed light on threats that affect survival in the migration and wintering range.

Population dynamics

The 2006 International Piping Plover Breeding Census, the last comprehensive survey throughout the breeding grounds, documented 3,497 breeding pairs with a total of 8,065 birds throughout Canada and the U.S, and a total of 454 in Florida (Elliott-Smith et al. 2009). The surveys covered approximately 760.5 miles and included 186 sites (Elliott-Smith et al 2009). As the Atlantic Coast is not included in the action area, the breakdown for the Gulf Coast of Florida is: 321 piping plovers at 117 sites covering approximately 522 miles of suitable habitat (Elliott-Smith et al 2009).

Numbers for Florida can be further broken down into 3 regions along the Gulf Coast. The northwest Florida census area in the panhandle extends from the Alabama line to Jefferson County, the north Florida census area from Taylor County south to Manatee County, and southwest Florida from Sarasota County south to Key West NWR. Northwest Florida numbers for the 2006 International Piping Plover Census were 111 with an increased survey effort from previous years. This represents an increase from the 53 piping plovers sighted in the 2001 effort. North Florida reported 96 birds and estimated an additional 40 from missing data sheets. There were 74 piping plovers located in southwest Florida as compared to 50 in the 2001 effort (Elliott-Smith et al 2009). The mainland portion of Monroe County is, technically, on the Gulf Coast of Florida, however, the predominant habitat is mangrove shoreline and no piping plovers were sighted at the survey location on Pavilion Key.

Atlantic Coast population

The Atlantic Coast piping plover breeds on coastal beaches from Newfoundland and southeastern Quebec to North Carolina. Historical population trends for the Atlantic Coast piping plover have been reconstructed from scattered, largely qualitative records. Nineteenth-century naturalists, such as Audubon and Wilson, described the piping plover as a common summer resident on Atlantic Coast beaches (Haig and Oring 1987). However, by the beginning of the twentieth century, egg collecting and uncontrolled hunting, primarily for the millinery trade, had greatly reduced the population, and in some areas along the Atlantic Coast, the piping plover was close to extirpation. Following passage of the Migratory Bird Treaty Act (MBTA) in 1918, and changes in the fashion industry that no longer exploited wild birds for feathers, piping plover numbers recovered to some extent (Haig and Oring 1985).

Available data suggest the most recent population decline began in the late 1940s or early 1950s (Haig and Oring 1985). Reports of local or statewide declines between 1950 and 1985 are numerous, and many are summarized by Cairns and McLaren (1980) and Haig and Oring (1985). While Wilcox (1939) estimated more than 500 pairs of piping plovers on Long Island, New York, the 1989 population estimate was 191 pairs (Service 1996). There was little focus on gathering quantitative data on piping plovers in Massachusetts through the late 1960s because the species was commonly observed and presumed to be secure. However, numbers of piping plover breeding pairs declined 50 to 100 percent at seven Massachusetts sites between the early 1970s and 1984 (Griffin and Melvin 1984). Piping plover surveys in the early years of the recovery effort found counts of these cryptically colored birds sometimes increased with increased census effort, suggesting some historic counts of piping plovers by one or more observers may have underestimated the piping plover population. Thus, the magnitude of the species decline may have been more severe than available numbers imply.

The New England recovery unit population has exceeded (or been within three pairs of) its 625-pair abundance goal since 1998, attaining a postlisting high of 711 pairs in 2008. The New York-New Jersey recovery unit reached 586 pairs in 2007, surpassing its 575-pair goal for the first time; however, in 2008, abundance dipped to 554 pairs. The Southern recovery unit, which attained 333 pairs in 2007 and 331 pairs in 2008, has not yet reached its 400-pair goal.

The Eastern Canada recovery unit has experienced the lowest population growth (9 percent net increase between 1989 and 2008), despite higher overall productivity than in the U.S. The highest postlisting abundance estimate was 274 pairs in 2002, with a 2008 estimate of 253 pairs, placing this recovery unit furthest from its goal (400 pairs).

Great Lakes population

The Great Lakes plovers once nested on Great Lakes beaches in Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Wisconsin, and Ontario. Great Lakes piping plovers nest on wide, flat, open, sandy or cobble shoreline with very little grass or other vegetation. Reproduction is adversely affected by human disturbance of nesting areas and predation by foxes, gulls, crows and other avian species. Shoreline development, such as the construction of marinas, breakwaters, and other navigation structures, has adversely affected nesting and brood rearing.

The Recovery Plan (Service 2003a) set a population goal of at least 150 pairs (300 individuals), for at least 5 consecutive years, with at least 100 breeding pairs (200 individuals) in Michigan and 50 breeding pairs (100 individuals) distributed among sites in other Great Lakes states. In 2008, the current Great Lakes piping plover population was estimated at 63 breeding pairs (126 individuals). Of these, 53 pairs were found nesting in Michigan, while 10 were found outside the state, including six pairs in Wisconsin and four in Ontario. The 53 nesting pairs in Michigan represent approximately 50 percent of the recovery criterion. The 10 breeding pairs outside Michigan in the Great Lakes basin, represents 20 percent of the goal, albeit the number of breeding pairs outside Michigan has continued to increase over the past 5 years. The single breeding pair discovered in 2007 in the Great Lakes region of Canada represented the first confirmed piping plover nest there in over 30 years, and in 2008 the number of nesting pairs further increased to four.

Northern Great Plains population

The Northern Great Plains plover breeds from Alberta to Manitoba, Canada and south to Nebraska; although some nesting has recently occurred in Oklahoma. Currently the most westerly breeding piping plovers in the U.S. occur in Montana and Colorado. The decline of piping plovers on rivers in the Northern Great Plains has been largely attributed to the loss of sandbar island habitat and forage base due to dam construction and operation. Nesting occurs on sand flats or bare shorelines of rivers and lakes, including sandbar islands in the upper Missouri River system, and patches of sand, gravel, or pebbly-mud on the alkali lakes of the northern Great Plains. Plovers do nest on shorelines of reservoirs created by the dams, but reproductive success is often low and reservoir habitat is not available in many years due to high water levels or vegetation. Dams operated with steady constant flows allow vegetation to grow on potential nesting islands, making these sites unsuitable for nesting. Population declines in alkali wetlands are attributed to wetland drainage, contaminants, and predation.

The International Piping Plover Census, conducted every 5 years, also estimates the number of piping plover pairs in the Northern Great Plains. None of the International Piping Plover Census estimates suggest that the Northern Great Plains population has yet satisfied the recovery criterion of 2,300 pairs (Table 1).

The International Piping Plover Census results in prairie Canada reported 1,703 adult birds in 2006, well short of the goal of 2,500 adult piping plover as stated in the Service's Recovery Plan (Service 1988).

Status and distribution

Nonbreeding (migrating and wintering)

Piping plovers spend up to 10 months of their life cycle on their migration and at wintering grounds, generally July 15 through as late as May 15. Piping plover migration routes and habitats overlap breeding and wintering habitats, and, unless banded, migrants passing through a site usually are indistinguishable from breeding or wintering piping plovers. Migration stopovers by banded piping plovers from the Great Lakes have been documented in New Jersey,

Maryland, Virginia, and North Carolina (Stucker and Cuthbert 2006). Migrating breeders from eastern Canada have been observed in Massachusetts, New Jersey, New York, and North Carolina (Amirault et al. 2005). As many as 85 staging piping plovers have been tallied at various sites in the Atlantic breeding range (Perkins 2008), but the composition (*e.g.*, adults that nested nearby and their fledged young of the year versus migrants moving to or from sites farther north), stopover duration, and local movements are unknown. In general, distance between stopover locations and duration of stopovers throughout the coastal migration range remains poorly understood.

Review of published records of piping plover sightings throughout North America by Pompei and Cuthbert (2004) found more than 3,400 fall and spring stopover records at 1,196 sites. Published reports indicated piping plovers do not concentrate in large numbers at inland sites and they seem to stop opportunistically. In most cases, reports of birds at inland sites were single individuals.

Piping plovers migrate through and winter in coastal areas of the U.S. from North Carolina to Texas and in portions of Mexico and the Caribbean. Data based on four rangewide mid-winter (late January to early February) population surveys, conducted at 5-year intervals starting in 1991, show that total numbers have fluctuated over time, with some areas experiencing increases and others decreases (Table 2). Regional and local fluctuations may reflect the quantity and quality of suitable foraging and roosting habitat, which vary over time in response to natural coastal formation processes as well as anthropogenic habitat changes (*e.g.*, inlet relocation, dredging of shoals and spits). Fluctuations may also represent localized weather conditions (especially wind) during surveys, or unequal survey coverage. For example, airboats facilitated first-time surveys of several central Texas sites in 2006 (Elliott-Smith et al. 2009). Similarly, the increase in the 2006 numbers in the Bahamas is attributed to greatly increased census efforts; the extent of additional habitat not surveyed remains undetermined (Elliott-Smith et al. 2009). Changes in wintering numbers may also be influenced by growth or decline in the particular breeding populations that concentrate their wintering distribution in a given area. Opportunities to locate previously unidentified wintering sites are concentrated in the Caribbean and Mexico (Elliott-Smith et al. 2009). Further surveys and assessment of seasonally emergent habitats (*e.g.*, seagrass beds, mudflats, oyster reefs) within bays lying between the mainland and barrier islands in Texas are also needed.

Midwinter surveys may underestimate the abundance of nonbreeding piping plovers using a site or region during other months. In late September 2007, 104 piping plovers were counted at the south end of Ocracoke Island, North Carolina (National Park Service [NPS] 2007), where none were seen during the 2006 International Piping Plover Winter Census (Elliott-Smith et al. 2009). Noel et al. (2007) observed up to 100 piping plovers during peak migration at Little St. Simons Island, Georgia, where approximately 40 piping plovers wintered in 2003 to 2005. Differences among fall, winter, and spring counts in South Carolina were less pronounced, but inter-year fluctuations (*e.g.*, 108 piping plovers in spring 2007 versus 174 piping plovers in spring 2008) at 28 sites were striking (Maddock et al. 2009). Even as far south as the Florida Panhandle, monthly counts at Phipps Preserve in Franklin County ranged from a midwinter low of four piping plovers in December 2006, to peak counts of 47 in October 2006 and March 2007 (Smith 2007). Pinkston (2004) observed much heavier use of Texas Gulf Coast (ocean-facing) beaches

between early September and mid-October (approximately 16 birds per mile) than during December to March (approximately 2 birds per mile).

Local movements of non-breeding piping plovers may also affect abundance estimates. At Deveaux Bank, one of South Carolina's most important piping plover sites, 5 counts at approximately 10-day intervals between August 27 and October 7, 2006, oscillated from 28 to 14 to 29 to 18 to 26 (Maddock et al. 2009). Noel and Chandler (2008) detected banded Great Lakes piping plovers known to be wintering on their Georgia study site in 73.8 $\pm$ 8.1 percent of surveys over 3 years.

Abundance estimates for non-breeding piping plovers may also be affected by the number of surveyor visits to the site. Preliminary analysis of detection rates by Maddock et al. (2009) found 87 percent detection during the midwinter period on core sites surveyed three times a month during fall and spring and one time per month during winter, compared with 42 percent detection on sites surveyed three times per year (Cohen 2009).

Gratto-Trevor et al. (2009) found strong patterns (but no exclusive partitioning) in winter distribution of uniquely banded piping plovers from four breeding populations (Figure 2). All eastern Canada and 94 percent of Great Lakes birds wintered from North Carolina to southwest Florida. However, eastern Canada birds were more heavily concentrated in North Carolina, and a larger proportion of Great Lakes piping plovers were found in South Carolina and Georgia. Northern Great Plains populations were primarily seen farther west and south, especially on the Texas Gulf Coast. Although the great majority of Prairie Canada individuals were observed in Texas, particularly southern Texas, individuals from the U.S. Great Plains were more widely distributed on the Gulf Coast from Florida to Texas.

The findings of Gratto-Trevor et al. (2009) provide evidence of differences in the wintering distribution of piping plovers from these four breeding areas. However, the distribution of birds by breeding origin during migration remains largely unknown. Other major information gaps include the wintering locations of the U.S. Atlantic Coast breeding population (banding of U.S. Atlantic Coast piping plovers has been extremely limited) and the breeding origin of piping plovers wintering on Caribbean islands and in much of Mexico.

Banded piping plovers from the Great Lakes, Northern Great Plains, and eastern Canada breeding populations showed similar patterns of seasonal abundance at Little St. Simons Island, Georgia (Noel et al. 2007). However, the number of banded plovers originating from the latter two populations was relatively small at this study area.

This species exhibits a high degree of intra- and interannual wintering site fidelity (Nicholls and Baldassarre 1990a; Drake et al. 2001; Noel and Chandler 2005; Stucker and Cuthbert 2006). Gratto-Trevor et al. (2009) reported that 6 of 259 banded piping plovers observed more than once per winter moved across boundaries of the 7 U.S. regions. Of 216 birds observed in different years, only 8 changed regions between years, and several of these shifts were associated with late summer or early spring migration periods (Gratto-Trevor et al. 2009). Total number of individuals observed on the wintering grounds was 46 for Eastern Canada, 150 for the U.S. Great Lakes, 169 for the U.S. Great Plains, and 356 for Prairie Canada.

Local movements are more common. In South Carolina, Maddock et al. (2009) documented many cross-inlet movements by wintering banded piping plovers as well as occasional movements of up to 11.2 miles by approximately 10 percent of the banded population. Larger movements within South Carolina were seen during fall and spring migration. Similarly, eight banded piping plovers that were observed in two locations during 2006 and 2007 surveys in Louisiana and Texas were all in close proximity to their original location (Maddock 2008).

In 2001, 2,389 piping plovers were located during a winter census, accounting for only 40 percent of the known breeding birds recorded during a breeding census (Ferland and Haig 2002). About 89 percent of birds that are known to winter in the U.S. do so along the Gulf Coast (Texas to Florida), while 8 percent winter along the Atlantic Coast (North Carolina to Florida).

The status of piping plovers on winter and migration grounds is difficult to assess, but threats to piping plover habitat used during winter and migration identified by the Service during its designation of critical habitat continue to affect the species. Unregulated motorized and pedestrian recreational use, inlet and shoreline stabilization projects, beach maintenance and nourishment, and pollution affect most winter and migration areas. Conservation efforts at some locations have likely resulted in the enhancement of wintering habitat.

The 2004 and 2005 hurricane seasons affected a substantial amount of habitat along the Gulf Coast. Habitats such as those along Gulf Islands National Seashore have benefited from increased washover events which created optimal habitat conditions for piping plovers. Conversely, hard shoreline structures are put into place following storms throughout the species range to prevent such shoreline migration (see *Factors Affecting the Species Habitat within the Action Area*). Four hurricanes between 2002 and 2005 are often cited in reference to rapid erosion of the Chandeleur Islands, a chain of low-lying islands in Louisiana where the 1991 International Piping Plover Census tallied more than 350 piping plovers. Comparison of imagery taken 3 years before and several days after Hurricane Katrina found that the Chandeleur Islands lost 82 percent of their surface area (Sallenger et al. in review), and a review of aerial photography prior to the 2006 Census suggested little piping plover habitat remained (Elliott-Smith et al. 2009). However, Sallenger et al. (in review) noted that habitat changes in the Chandeleurs stem not only from the effects of these storms, but rather from the combined effects of the storms, long-term (greater than 1,000 years) diminishing sand supply, and sea level rise relative to the land.

The Service is aware of the following site specific conditions that affect the status of several habitats piping plover use while wintering and migrating, including critical habitat units. In Texas, one critical habitat unit was afforded greater protection due to the acquisition of adjacent upland properties by the local Audubon chapter. In another unit in Texas, vehicles were removed from a portion of the beach decreasing the likelihood of automobile disturbance to plovers. Exotic plant removal is occurring in another critical habitat unit in South Florida. The Service and other government agencies remain in a contractual agreement with the U.S. Department of Agriculture for predator control within limited coastal areas in the Florida panhandle, including portions of some critical habitat units. Continued removal of potential terrestrial predators is likely to enhance survivorship of wintering and migrating piping plovers. In

North Carolina, one critical habitat unit was afforded greater protection when the local Audubon chapter agreed to manage the area specifically for piping plovers and other shorebirds following the relocation of a nearby inlet channel.

Recovery criteria

Northern Great Plains Population (Service 1988, 1994)

1. Increase the number of birds in the U.S. northern Great Plains states to 2,300 pairs (Service 1994).
2. Increase the number of birds in the prairie region of Canada to 2,500 adult piping plovers (Service 1988).
3. Secure long term protection of essential breeding and wintering habitat (Service 1994).

Great Lakes Population (Service 2003a)

1. At least 150 pairs (300 individuals), for at least 5 consecutive years, with at least 100 breeding pairs (200 individuals) in Michigan and 50 breeding pairs (100 individuals) distributed among sites in other Great Lakes states.
2. Five-year average fecundity within the range of 1.5 to 2.0 fledglings per pair, per year, across the breeding distribution, and 10-year population projections indicate the population is stable or continuing to grow above the recovery goal.
3. Protection and long-term maintenance of essential breeding and wintering habitat is ensured, sufficient in quantity, quality, and distribution to support the recovery goal of 150 pairs (300 individuals).
4. Genetic diversity within the population is deemed adequate for population persistence and can be maintained over the long-term.
5. Agreements and funding mechanisms are in place for long-term protection and management activities in essential breeding and wintering habitat.

Atlantic Coast Population (Service 1996)

1. Increase and maintain for 5 years a total of 2,000 breeding pairs, distributed among 4 recovery units.

Recovery Unit	Minimum Subpopulation
Atlantic (eastern) Canada	400 pairs
New England	625 pairs
New York-New Jersey	575 pairs
Southern (DE, MD, VA, NC)	400 pairs

2. Verify the adequacy of a 2,000 pair population of piping plovers to maintain heterozygosity and allelic diversity over the long term.

3. Achieve a 5-year average productivity of 1.5 fledged chicks per pair in each of the 4 recovery units described in criterion 1, based on data from sites that collectively support at least 90 percent of the recover unit's population.

4. Institute long-term agreements to assure protection and management sufficient to maintain the population targets and average productivity in each recovery unit.

5. Ensure long-term maintenance of wintering habitat, sufficient in quantity, quality, and distribution to maintain survival rates for a 2,000-pair population.

Threats to Piping Plovers

In the following sections, threats to piping plovers in their migration and wintering range is provided. This information has been updated since the 1985 listing rule, the 1991 status review, and the three breeding population recovery plans. Previously identified and new threats are discussed. With minor exceptions, this analysis is focused on threats to piping plovers within the continental U.S. portion of their migration and wintering range. Threats in the Caribbean and Mexico remain largely unknown.

Present or threatened destruction, modification, or curtailment of its habitat or range

The 1985 final rule stated the number of piping plovers on the Gulf of Mexico coastal wintering grounds might be declining as indicated by preliminary analysis of the Christmas Bird Count data. Independent counts of piping plovers on the Alabama coast indicated a decline in numbers between the 1950s and early 1980s. At the time of listing, the Texas Parks and Wildlife Department stated that 30 percent of wintering habitat in Texas had been lost over the previous 20 years. The final rule also stated in addition to extensive breeding area problems, the loss and modification of wintering habitat was a significant threat to the piping plover.

The three recovery plans stated that shoreline development throughout the wintering range poses a threat to all populations of piping plovers. The plans further stated beach maintenance and nourishment, inlet dredging, and artificial structures such as jetties and groins, could eliminate wintering areas and alter sedimentation patterns leading to the loss of nearby habitat.

Priority 1 actions in the 1996 Atlantic Coast and 2003 Great Lakes Recovery Plans identify tasks to protect natural processes that maintain coastal ecosystems and quality wintering piping plover habitat, and to protect wintering habitat from shoreline stabilization and navigation projects. The 1988 Northern Great Plains Plan states as winter habitat is identified, current and potential threats to each site should be determined.

Important components of ecologically sound barrier beach management include perpetuation of natural dynamic coastal formation processes. Structural development along the shoreline or manipulation of natural inlets upsets the dynamic processes and results in habitat loss or degradation (Melvin et al. 1991). Throughout the range of migrating and wintering piping plovers, inlet and shoreline stabilization, inlet dredging, beach maintenance and nourishment activities, and seawall installations continue to constrain natural coastal processes. Dredging of inlets can affect spit formation adjacent to inlets and directly remove or affect ebb and flood tidal shoal formation.

Jetties, which stabilize an island, cause island widening and subsequent growth of vegetation on inlet shores. Seawalls restrict natural island movement and exacerbate erosion. As discussed in more detail below, all these efforts result in loss of piping plover habitat. Construction of these projects during months when piping plovers are present also causes disturbance that disrupts the birds' foraging efficiency and hinders their ability to build fat reserves over the winter and in preparation for migration, as well as their recuperation from migratory flights. Additional investigation is needed to determine the extent to which these factors cumulatively affect piping plover survival and how they may impede conservation efforts for the species.

Any assessment of threats to piping plovers from loss and degradation of habitat must recognize that up to 24 shorebird species migrate or winter along the Atlantic Coast and almost 40 species of shorebirds are present during migration and wintering periods in the Gulf of Mexico region (Helmers 1992). Continual degradation and loss of habitats used by wintering and migrating shorebirds may cause an increase in intra-specific and inter-specific competition for remaining food supplies and roosting habitats. For example, in Florida approximately 825 miles of coastline and parallel bayside flats (unspecified amount) were present prior to the advent of high human densities and beach stabilization projects. We estimate only about 35 percent of the Florida coastline continues to support natural coastal formation processes, thereby concentrating foraging and roosting opportunities for all shorebird species and forcing some individuals into suboptimal habitats. Thus, intra- and interspecific competition most likely exacerbates threats from habitat loss and degradation.

Exotic/invasive vegetation

A recently identified threat to piping plover habitat, not described in the listing rule or recovery plans, is the spread of coastal invasive plants into suitable piping plover habitat. Like most invasive species, coastal exotic plants reproduce and spread quickly and exhibit dense growth habits, often outcompeting native plant species. If left uncontrolled, invasive plants cause a habitat shift from open or sparsely vegetated sand to dense vegetation, resulting in the loss or degradation of piping plover roosting habitat, which is especially important during high tides and migration periods.

Beach vitex (*Vitex rotundifolia*) is a woody vine introduced into the southeastern U.S. as a dune stabilization and ornamental plant (Westbrooks and Madsen 2006). It currently occupies a very small percentage of its potential range in the U.S.; however, it is expected to grow well in coastal communities throughout the southeastern U.S. from Virginia to Florida, and west to Texas (Westbrooks and Madsen 2006). In 2003, the plant was documented in New Hanover, Pender, and Onslow counties in North Carolina, and at 125 sites in Horry, Georgetown, and Charleston counties in South Carolina. One Chesapeake Bay site in Virginia was eradicated, and another site on Jekyll Island, Georgia, is about 95 percent controlled (Suiter 2009). Beach vitex has been documented from two locations in northwest Florida, but one site disappeared after erosional storm events. The landowner of the other site has indicated an intention to eradicate the plant, but follow through is unknown (Farley 2009). Task forces formed in North and South Carolina in 2004 and 2005, have made great strides to remove this plant from their coasts. To date, about 200 sites in North Carolina have been treated, with 200 additional sites in need of treatment. Similar efforts are underway in South Carolina.

Unquantified amounts of crowfootgrass (*Dactyloctenium aegyptium*) grow invasively along portions of the Florida coastline. It forms thick bunches or mats that may change the vegetative structure of coastal plant communities and alter shorebird habitat.

The Australian pine (*Casuarina equisetifolia*) changes the vegetative structure of the coastal community in south Florida and islands within the Bahamas. Shorebirds prefer foraging in open areas where they are able to see potential predators, and tall trees provide good perches for avian predators. Australian pines potentially affect shorebirds, including the piping plover, by reducing attractiveness of foraging habitat and/or increasing avian predation.

The propensity of these exotic species to spread, and their tenacity once established, make them a persistent threat, partially countered by increasing landowner awareness and willingness to undertake eradication activities.

Groins

Groins (structures made of concrete, rip rap, wood, or metal built perpendicular to the beach in order to trap sand) are typically found on developed beaches with severe erosion. Although groins can be individual structures, they are often clustered along the shoreline. Groins act as barriers to longshore sand transport and cause downdrift erosion, which prevents piping plover habitat creation by limiting sediment deposition and accretion (Hayes and Michel 2008). These structures are found throughout the southeastern Atlantic Coast, and although most were in place prior to the piping plover's 1986 Act listing, installation of new groins continues to occur.

Inlet stabilization/relocation

Many navigable mainland or barrier island tidal inlets along the Atlantic and Gulf of Mexico coasts are stabilized with jetties, groins, seawalls, and/or adjacent industrial or residential development. Jetties are structures built perpendicular to the shoreline that extend through the entire nearshore zone and past the breaker zone (Hayes and Michel 2008) to prevent or decrease sand deposition in the channel. Inlet stabilization with rock jetties and associated channel dredging for navigation alter the dynamics of longshore sediment transport and affect the location and movement rate of barrier islands (Camfield and Holmes 1995), typically causing downdrift erosion. Sediment is then dredged and added back to islands which are subsequently widened. Once the island becomes stabilized, vegetation encroaches on the bayside habitat, thereby diminishing and eventually destroying its value to piping plovers. Accelerated erosion may compound future habitat loss, depending on the degree of sea level rise. Unstabilized inlets naturally migrate, reforming important habitat components, whereas jetties often trap sand and cause significant erosion of the downdrift shoreline. These combined actions affect the availability of piping plover habitat (Cohen et al. 2008).

Using Google Earth© (accessed April 2009), Service biologists visually estimated the number of navigable mainland or barrier island tidal inlets throughout the wintering range of the piping plover in the conterminous U.S. that have some form of hardened structure (Table 3). This includes seawalls or adjacent development, which lock the inlets in place.

Tidal inlet relocation can cause loss and/or degradation of piping plover habitat, although less permanent than construction of hard structures where effects can persist for years. For example, a project on Kiawah Island, South Carolina, degraded one of the most important piping plover habitats in the State by reducing the size and physical characteristics of an active foraging site, changing the composition of the benthic community, decreasing the tidal lag in an adjacent tidal lagoon, and decreasing the exposure time of the associated sand flats (Service and Town of Kiawah Island unpublished data). In 2006, preproject piping plover numbers in the project area recorded during four surveys conducted at low tide averaged 13.5 piping plovers. This contrasts with a postproject average of 7.1 plovers during eight surveys (four in 2007 and four in 2008) conducted during the same months (Service and Town of Kiawah Island unpublished data). Service biologists are aware of at least seven inlet relocation projects (two in North Carolina, three in South Carolina, two in Florida), but this number likely under represents the extent of this activity.

Sand mining/dredging

Sand mining, the practice of dredging sand from sand bars, shoals, and inlets in the nearshore zone, is a less expensive source of sand than obtaining sand from offshore shoals for beach nourishment. Sand bars and shoals are sand sources that move onshore over time and act as natural breakwaters. Inlet dredging reduces the formation of exposed ebb and flood tidal shoals considered to be primary or optimal piping plover roosting and foraging habitat. Removing these sand sources can alter depth contours and change wave refraction as well as cause localized erosion (Hayes and Michel 2008). Exposed shoals and sandbars are also valuable to piping plovers, as they tend to receive less human recreational use (because they are only accessible by boat) and therefore provide relatively less disturbed habitats for birds. An accurate estimate of the amount of sand mining that occurs across the piping plover wintering range, or the number of inlet dredging projects that occur is not available. This number is likely greater than the number of total jettied inlets shown in Table 3, since most jettied inlets need maintenance dredging, but non-hardened inlets are often dredged as well.

Sand placement projects

In the wake of episodic storm events, managers of lands under public, private, and county ownership often protect coastal structures using emergency storm berms which are frequently followed by beach nourishment or renourishment activities (nourishment projects are considered "soft" stabilization versus "hard" stabilization such as seawalls). Berm placement and beach nourishment projects deposit substantial amounts of sand along Gulf of Mexico and Atlantic beaches to protect local property in anticipation of preventing erosion and what otherwise will be considered natural processes of overwash and island migration (Schmitt and Haines 2003).

Past and ongoing stabilization projects fundamentally alter the natural dynamic coastal processes that create and maintain beach strand and bayside habitats, including those habitat components that piping plovers rely upon. Although the effects may vary depending on a range of factors, stabilization projects may directly degrade or destroy piping plover roosting and foraging habitat in several ways. Front beach habitat may be used to construct an artificial berm that is densely planted in grass, which can directly reduce the availability of roosting habitat. Over time, if the

beach narrows due to erosion, additional roosting habitat between the berm and the water can be lost. Berms can also prevent or reduce the natural overwash that creates roosting habitats by converting vegetated areas to open sand areas. The vegetation growth caused by impeding natural overwash can also reduce the maintenance and creation of bayside intertidal feeding habitats. In addition, stabilization projects may indirectly encourage further development of coastal areas and increase the threat of disturbance.

Lott et al. (in review) documented an increasing trend in sand placement events in Florida (Figure 3). Approximately 358 miles of 825 miles (43 percent) of Florida's sandy beach coastline were nourished from 1959 to 2006 (Table 4), with some areas being nourished multiple times. In northwest Florida, the Service consulted on first time sand placement projects along 46 miles of shoreline in 2007 to 2008, much of which occurred on public lands (Gulf Islands National Seashore (Service 2007a), portions of St. Joseph State Park (Service 2007b), and Eglin Air Force Base (Service 2008a).

At least 668 of 2,340 coastal shoreline miles (29 percent of beaches throughout the piping plover winter and migration range in the U.S.) are bermed, nourished, or renourished, generally for recreational purposes and to protect commercial and private infrastructure. However, only approximately 54 miles or 2.31 percent of these effects have occurred within critical habitat. In Louisiana, sand placement projects are deemed environmental restoration projects by the Service because without the sediment many areas would erode below sea level.

Seawalls and revetments

Seawalls and revetments are vertical hard structures built parallel to the beach in front of buildings, roads, and other facilities to protect them from erosion. However, these structures often accelerate erosion by causing scouring in front of and downdrift from the structure (Hayes and Michel 2008) which can eliminate intertidal foraging habitat and adjacent roosting habitat. Physical characteristics that determine microhabitats and biological communities can be altered after installation of a seawall or revetment, thereby depleting or changing composition of benthic communities that serve as the prey base for piping plovers. At four California study sites, each comprised of an unarmored segment and a segment seaward of a seawall, Dugan and Hubbard (2006) found armored segments had narrower intertidal zones, smaller standing crops of macrophyte wrack, and lower shorebird abundance and species richness. Geotubes (long cylindrical bags made of high strength permeable fabric and filled with sand) are softer alternatives, but act as barriers by preventing overwash.

Wrack removal and beach cleaning

Wrack on beaches and baysides provides important foraging and roosting habitat for piping plovers (Drake 1999a; Smith 2007; Lott et al. 2009; Maddock et al. 2009) and many other shorebirds on their winter, breeding, and migration grounds. Because shorebird numbers are positively correlated with wrack cover and biomass of their invertebrate prey that feed on wrack (Tarr and Tarr 1987; Dugan et al. 2003; Hubbard and Dugan 2003), beach grooming will lower bird abundance (Defreo et al. 2009).

There is increasing popularity in the Southeast, especially in Florida, for beach communities to carry out "beach cleaning" and "beach raking" actions. Beach cleaning occurs on private beaches, where piping plover use is not well documented, and on some municipal or county beaches that are used by piping plovers. Most wrack removal on State and Federal lands is limited to poststorm cleanup and does not occur regularly.

Manmade beach cleaning and raking machines effectively remove seaweed, fish, glass, syringes, plastic, cans, cigarettes, shells, stone, wood, and virtually any unwanted debris (Barber Beach Cleaning Equipment 2011). These efforts remove accumulated wrack, topographic depressions, and sparse vegetation nodes used by roosting and foraging piping plovers. Removal of wrack also eliminates a beach's natural sand trapping abilities, further destabilizing the beach. In addition, sand adhering to seaweed and trapped in the cracks and crevices of wrack is removed from the beach. Although the amount of sand lost due to single sweeping actions may be small, it adds up considerably over a period of years (Nordstrom et al. 2006; Neal et al. 2007). Beach cleaning or grooming can result in abnormally broad unvegetated zones that are inhospitable to dune formation or plant colonization, thereby enhancing the likelihood of erosion (Defreo et al. 2009).

Tilling beaches to reduce soil compaction, as sometimes required by the Service for sea turtle protection after beach nourishment activities, has similar effects. Recently, the Service improved sea turtle protection provisions in Florida. These provisions now require tilling, when needed, to be conducted above the primary wrack line, not within it.

Currently, the DEP's Beaches and Coastal Management Systems section has issued 117 permits for beach raking or cleaning to multiple entities. The Service estimates that 240 of 825 miles (29 percent) of sandy beach shoreline in Florida are cleaned or raked on various (*i.e.*, daily, weekly, monthly) schedules (Teich 2009). Service biologists estimate that South Carolina mechanically cleans approximately 34 of its 187 shoreline miles (18 percent), and Texas mechanically cleans approximately 20 of its 367 shoreline miles (5.4 percent). The percentage of mechanical cleaning that occurs in piping plover critical habitat is unknown.

Overutilization for commercial, recreational, scientific or educational purposes

The 1985 final listing rule found no evidence to suggest this factor is a threat to piping plovers while on migration or winter grounds. The various recovery plans state hunting in the late 1800s may have severely reduced piping plover numbers. The plans did not identify hunting as an existing threat to piping plovers wintering in the U.S., as take is prohibited pursuant to the MBTA. No credible information indicates hunting is a threat in the U.S. or in other countries. Based on the current information, overutilization is not a threat to piping plovers on their wintering and migration grounds.

Disease and predation

Disease

Neither the final listing rule nor the recovery plans state disease is an issue for piping plover, and no plan assigns recovery actions to this threat factor. Based on information available to date, West Nile virus and avian influenza are a minor threat to piping plovers (Service 2009).

Predation

The effect of predation on migrating or wintering piping plovers remains largely undocumented. Except for one incident involving a cat in Texas (NY Times 2007), no predation of piping plovers during winter or migration has been noted. Avian and mammalian predators are common throughout the species' wintering range. Predatory birds are relatively common during fall and spring migration, and it is possible raptors occasionally take piping plovers (Drake et al. 2001). It has been noted, however, the behavioral response of crouching when in the presence of avian predators may minimize avian predation on piping plovers (Morrier and McNeil 1991; Drake 1999b; Drake et al. 2001).

The 1996 Atlantic Coast Recovery Plan summarized evidence that human activities affect types, abundance, and activity patterns of some predators, thereby exacerbating natural predation on breeding piping plovers. Nonbreeding piping plovers may reap some collateral benefits from predator management conducted for the primary benefit of other species. In 1997, the U.S. Department of Agriculture implemented a public lands predator control partnership in northwest Florida that included the Department of Defense, NPS, the State of Florida (state park lands), and the Service (National Wildlife Refuges and Ecological Services). The program continues with all partners except Florida. In 2008, lack of funding precluded inclusion of Florida state lands; however, DEP staff do occasionally conduct predator trapping on state lands, although trapping is not implemented consistently.

The NPS and individual state park staff in North Carolina participate in predator control programs (Rabon 2009). The Service issued permit conditions for raccoon eradication to Indian River County staff in Florida as part of a coastal HCP (Adams 2009). Destruction of turtle nests by dogs or coyotes in Indian River County justified the need to amend the permit to include an education program targeting dog owners regarding the appropriate means to reduce affects to coastal species caused by their pets. The Service partnered with Texas Audubon and the Coastal Bend Bays and Estuaries Program in Texas to implement predator control efforts on colonial waterbird nesting islands (Cobb 2009). Some of these predator control programs may provide very limited protection to piping plovers should they use these areas for roosting or foraging (Table 5). The Service is not aware of any current predator control programs targeting protection of coastal species in Georgia, Alabama, Mississippi, or Louisiana.

Regarding predation, the magnitude of this threat to non-breeding piping plovers remains unknown, but given the pervasive, persistent, and serious effects of predation on other coastal reliant species, it remains a potential threat. Focused research to confirm these effects s as well as to ascertain effectiveness of predator control programs may be warranted, especially in areas frequented by Great Lakes birds during migration and wintering months. The Service considers predator control on their wintering and migration grounds to be a low priority at this time. The threat of direct predation should be distinguished from the threat of disturbance to roosting and feeding piping plovers posed by dogs off leash.

Other natural or manmade factors affecting its continued existence

Accelerating sea-level rise

Over the past 100 years, the globally-averaged sea level has risen approximately 3.9 to 9.8 inches (Rahmstorf 2007), a rate that is an order of magnitude greater than that seen in the past several

thousand years (Hopkinson et al. 2008). The Intergovernmental Panel of Climate Change (IPCC) suggests by 2080 sea level rise could convert as much as 33 percent of the world's coastal wetlands to open water (IPCC 2007). Although rapid changes in sea level are predicted, estimated time frames and resulting water levels vary due to the uncertainty about global temperature projections and the rate of ice sheets melting and slipping into the ocean (IPCC 2007; Climate Change Science Program [CCSP] 2008).

Potential effects of sea level rise on coastal beaches may vary regionally due to subsidence or uplift as well as the geological character of the coast and nearshore (Galbraith et al. 2002; CCSP 2009). For example, in the last century sea level rise along the U.S. Gulf Coast exceeded the global average by 5.1 to 5.9 inches because coastal lands west of Florida are subsiding (U.S. Environmental Protection Agency [EPA] 2009). Low elevations and proximity to the coast make all nonbreeding coastal piping plover foraging and roosting habitats vulnerable to the effects of rising sea level. Furthermore, areas with small astronomical tidal ranges (*e.g.,* portions of the Gulf Coast where intertidal range is greater than 3.2 feet) are the most vulnerable to loss of intertidal wetlands and flats induced by sea level rise (EPA 2009). Sea level rise was cited as a contributing factor in the 68 percent decline in tidal flats and algal mats in the Corpus Christi area (*i.e.,* Lamar Peninsula to Encinal Peninsula) in Texas between the 1950s and 2004 (Tremblay et al. 2008). Mapping by Titus and Richman (2001) showed that more than 80 percent of the lowest land along the Atlantic and Gulf coasts was in Louisiana, Florida, Texas, and North Carolina, where 73.5 percent of all wintering piping plovers were tallied during the 2006 International Piping Plover Census (Elliott-Smith et al. 2009).

Inundation of piping plover habitat by rising seas could lead to permanent loss of habitat if natural coastal dynamics are impeded by numerous structures or roads, especially if those shorelines are also armored with hardened structures. Without development or armoring, low undeveloped islands can migrate toward the mainland, pushed by the overwashing of sand eroding from the seaward side and being redeposited in the bay (Scavia et al. 2002). Overwash and sand migration are impeded on developed portions of islands. Instead, as sea level increases, the ocean-facing beach erodes and the resulting sand is deposited offshore. The buildings and the sand dunes then prevent sand from washing back toward the lagoons, and the lagoon side becomes increasingly submerged during extreme high tides (Scavia et al. 2002), diminishing both barrier beach shorebird habitat and protection for mainland developments.

Modeling for three sea level rise scenarios (reflecting variable projections of global temperature rise) at five important U.S. shorebird staging and wintering sites predicted a loss of 20 to 70 percent of current intertidal foraging habitat (Galbraith et al. 2002). These authors estimated probabilistic sea level changes for specific sites partially based on historical rates of sea level change (from tide gauges at or near each site) which were then superimposed on projected 50 percent and 5 percent probability of global sea level changes by 2100 of 13.4 inches and 30.3 inches, respectively. The 50 percent and 5 percent probability sea level change projections were based on assumed global temperature increases of 35.6° F (50 percent probability) and 40.5° F (5 percent probability). The most severe losses were projected at sites where the coastline is unable to move inland due to steep topography or seawalls. The Galbraith et al. (2002) Gulf Coast study site, Bolivar Flats, Texas, is a designated critical habitat unit known to host high numbers of piping plovers during migration and

throughout the winter (*e.g.*, 275 individuals were tallied during the 2006 International Piping Plover Census; Elliott-Smith et al. 2009). Under the 50 percent likelihood scenario for sea level rise, Galbraith et al. (2002) projected approximately 38 percent loss of intertidal flats at Bolivar Flats by 2050; however, after initially losing habitat, the area of tidal flat habitat was predicted to slightly increase by the year 2100, because Bolivar Flats lacks armoring, and the coastline at this site can thus migrate inland. Although habitat losses in some areas are likely to be offset by gains in other locations, Galbraith et al. (2002) noted time lags may exert serious adverse effects on shorebird populations. Furthermore, even if piping plovers are able to move their wintering locations in response to accelerated habitat changes, there could be adverse effects on the birds' survival rates or reproductive fitness.

In eight states that support wintering piping plovers, all have the potential for adjacent development and/or hardened shorelines to impede response of habitat to sea level rise (Table 6). Although complete linear shoreline estimates are not readily obtainable, almost all known piping plover wintering sites in the U.S. were surveyed during the 2006 International Piping Plover Census. To estimate effects at the census sites, as well as additional areas where piping plovers have been found outside of the census period, Service biologists reviewed satellite imagery and spoke with other biologists familiar with the sites. Of 406 sites, 204 (50 percent) have adjacent structures that may prevent the creation of new habitat if existing habitat were to become inundated (Table 6). These threats will be perpetuated in places where damaged structures are repaired and replaced, and exacerbated where the height and strength of structures are increased. Data do not exist on the amount or types of hardened structures at wintering sites in the Bahamas, other Caribbean countries, or Mexico.

Sea level rise poses a significant threat to all piping plover populations during the migration and wintering portion of their life cycle. Ongoing coastal stabilization activities may strongly influence the effects of sea level rise on piping plover habitat. Improved understanding of how sea level rise may affect the quality and quantity of habitat for migrating and wintering piping plovers is an urgent need.

Contaminants

Contaminants have the potential to cause direct toxicity to individual birds or negatively affect their invertebrate prey base (Rattner and Ackerson 2008). Depending on the type and degree of contact, contaminants can have lethal and sub-lethal effects on birds, including behavioral impairment, deformities, and impaired reproduction (Rand and Petrocelli 1985; Gilbertson et al. 1991; Hoffman et al. 1996).

The Great Lakes plan states concentration levels of polychlorinated biphenol detected in Michigan piping plover eggs have the potential to cause reproductive harm. They further state analysis of prey available to piping plovers at representative Michigan breeding sites indicated breeding areas along the upper Great Lakes region are not likely the major source of contaminants to this population.

In 2000, mortality of large numbers of wading birds and shorebirds, including one piping plover, at Audubon's Rookery Bay Sanctuary on Marco Island, Florida, occurred following the County's aerial application of the organophosphate pesticide Fenthion for mosquito control purposes (Williams 2001). Fenthion, a known toxin to birds, was registered for use as an avicide by Bayer chemical manufacturer. Subsequent to a lawsuit filed against the EPA in 2002, the manufacturer withdrew Fenthion from the market, and the EPA declared all uses were to end by November 30, 2004 (American Bird Conservancy 2011). All other counties in the U.S. now use less toxic chemicals for mosquito control. It is unknown whether pesticides are a threat for piping plovers wintering in the Bahamas, other Caribbean countries, or Mexico.

Petroleum products are the contaminants of primary concern, as opportunities exist for petroleum to pollute intertidal habitats that provide foraging substrate. Beach-stranded 55-gallon barrels and smaller containers, which may fall from moving cargo ships or offshore rigs and are not uncommon on the Texas coast, contain primarily oil products (gasoline or diesel), as well as other chemicals such as methanol, paint, organochlorine pesticides, and detergents (Lee 2009). Federal and state land managers have protective provisions in place to secure and remove the barrels, thus reducing the likelihood of contamination. Effects to piping plovers from oil spills have been documented throughout their life cycle (Chapman 1984; Service 1996; Burger 1997; Massachusetts Audubon 2003; Amirault-Langlais et al. 2007; Amos 2009). This threat persists due to the high volume of shipping vessels (from which most documented spills have originated) traveling offshore and within connected bays along the Atlantic Coast and the Gulf of Mexico. Additional risks exist for leaks or spills from offshore oil rigs, associated undersea pipelines, and onshore facilities such as petroleum refineries and petrochemical plants. Lightly oiled piping plovers have survived and successfully reproduced (Chapman 1984; Amirault-Langlais et al. 2007; Amos 2009). Chapman (1984) noted shifts in habitat use as piping plovers moved out of spill areas. This behavioral change was believed to be related to the demonstrated decline in benthic infauna (prey items) in the intertidal zone and may have decreased the direct effects to the species. To date, no plover mortality has been attributed to oil contamination outside the breeding grounds, but latent effects would be difficult to identify.

The Deepwater Horizon oil spill, which started April 20, 2010, discharged into the Gulf of Mexico through July 15, 2010. According to government estimates, the leak released between 100 and 200 million gallons of oil into the Gulf. The U.S. Coast Guard estimates that more than 50 million gallons of oil have been removed from the Gulf, or roughly a quarter of the spill amount. Additional effects to natural resources may be attributed to the 1.84 million gallons of dispersant applied to the spill. As of July 2010, approximately 625 miles of Gulf Coast shoreline was oiled (approximately 360 miles in Louisiana, 105 miles in Mississippi, 66 miles in Alabama and 94 miles in Florida) (Join Information Center 2010). These numbers reflect a daily snapshot of shoreline that experienced effects from oil; however, they do not include cumulative effects to date, or shoreline that has already been cleaned.

Piping plovers have continued to winter within the Gulf of Mexico shorelines. Researchers have and continue to document oiled piping plovers stemming from this spill. Oiling of designated piping plover critical habitat has been documented. Affects to the species and its habitat are expected, but their extent remains difficult to predict. The U.S. Coast Guard, the states, and

responsible parties form the Unified Command, with advice from Federal and State natural resource agencies, initiated protective and cleanup efforts per prepared contingency plans to deal with petroleum and other hazardous chemical spills for each state's coastline. The contingency plans identify sensitive habitats, including all federally listed species' habitats, which receive a higher priority for response actions. Those plans allow for immediate habitat protective measures for cleanup activities in response to large contaminant spills. While such plans usually ameliorate the threat to piping plovers, it is yet unknown how much improvement will result in this case given the breadth of the effects associated with the Deepwater Horizon incident.

Based on all available data prior to the Deepwater Horizon oil spill, the risk of effects from contamination to piping plovers and their habitat was recognized, but the safety contingency plans were considered adequate to alleviate most of these concerns. The Deepwater Horizon incident has brought heightened awareness of the intensity and extent to fish and wildlife habitat from large-scale releases. In addition to potential direct habitat degradation from oiling of intertidal habitats and retraction of stranded boom, effects to piping plovers may occur from the increased human presence associated with boom deployment and retraction, cleanup activities, wildlife response, and damage assessment crews working along shorelines. Research studies are documenting the potential expanse of effects to the piping plover.

Military actions

Twelve coastal military bases are located in the Southeast (Table 7). To date, five bases have consulted with the Service under the Act, on military activities on beaches and baysides that may affect piping plovers or their habitat (Table 7). In 2002, Camp Lejeune in North Carolina consulted formally with the Service on troop activities, dune stabilization efforts, and recreational use of Onslow Beach. The permit conditions require bi-monthly (twice-monthly) piping plover surveys, use of buffer zones, and work restrictions within buffer zones.

Naval Station Mayport in Duval County, Florida, consulted with the Service on U.S. Marine Corps training activities that included beach exercises and use of amphibious assault vehicles. The affected area was not considered optimal for piping plovers and the consultation was concluded informally. Similar informal consultations have occurred with Tyndall Air Force Base (Bay County) and Eglin Air Force Base (Okaloosa and Santa Rosa Counties) in northwest Florida. Both consultations dealt with occasional use of motorized equipment on the beaches and associated baysides. Tyndall Air Force Base has minimal on-the-ground use, and activities, when conducted, occur on the Gulf of Mexico beach, which is not considered the optimal area for piping plovers within this region. Eglin Air Force Base conducts bi-monthly (twice-monthly) surveys for piping plovers, and habitats consistently documented with piping plover use are posted with avoidance requirements to minimize direct disturbance from troop activities. A 2001 consultation with the Navy for training exercises on the beach and retraction operations on Peveto Beach, Cameron Parish, Louisiana, concluded informally.

Overall, project avoidance and minimization actions currently reduce threats from military activities to wintering and migrating piping plovers to a minimal threat level. However, prior to removal of the piping plover from protection of the Act, Integrated Resource Management Plans or other agreements should clarify if and how a change in legal status would affect plover protections.

Recreational disturbance

Intense human disturbance in shorebird winter habitat can be functionally equivalent to habitat loss if the disturbance prevents birds from using an area (Goss-Custard et al. 1996), which can lead to roost abandonment and local population declines (Burton et al. 1996). Pfister et al. (1992) implicated anthropogenic disturbance as a factor in the long-term decline of migrating shorebirds at staging areas. Disturbance (*i.e.*, human and pet presence) that alters bird behavior can disrupt piping plovers as well as other shorebird species. Disturbance can cause shorebirds to spend less time roosting or foraging and more time in alert postures or fleeing from the disturbances (Johnson and Baldassarre 1988; Burger 1991, 1994; Elliott and Teas 1996; Lafferty 2001a, 2001b; Thomas et al. 2002), which limits the local abundance of piping plovers (Zonick and Ryan 1996; Zonick 2000). Shorebirds that are repeatedly flushed in response to disturbance expend energy on costly short flights (Nudds and Bryant 2000). Shorebirds are more likely to flush from the presence of dogs than people, and birds react to dogs from farther distances than people (Lafferty 2001a, 2001b; Thomas et al. 2002). Dogs off leash are more likely to flush piping plovers from farther distances than dogs on leash. Nonetheless, dogs both on and off leashes disturb piping plovers (Hoopes 1993). Pedestrians walking with dogs often go through flocks of foraging and roosting shorebirds; some even encourage their dogs to chase birds.

Off-road vehicles can significantly degrade piping plover habitat (Wheeler 1979) or disrupt the birds' normal behavior patterns (Zonick 2000). The 1996 Atlantic Coast recovery plan cites tire ruts crushing wrack into the sand, making it unavailable as cover or as foraging substrate (Goldin 1993b; Hoopes 1993). The plan also notes the magnitude of the threat from off-road vehicles is particularly significant because vehicles extend the effects to remote stretches of beach where human disturbance would otherwise be very slight. Lamont et al. (1997) postulated vehicular traffic along the beach may compact the substrate and kill marine invertebrates that are food for the piping plover. Zonick (2000) found the density of off-road vehicles negatively correlated with abundance of roosting piping plovers on the ocean beach. Cohen et al. (2008) found radio-tagged piping plovers using ocean beach habitat at Oregon Inlet in North Carolina were far less likely to use the north side of the inlet where off-road vehicle use is allowed, and recommended controlled management experiments to determine if recreational disturbance drives roost site selection. Ninety-six percent of piping plover detections were on the south side of the inlet even though it was farther away from foraging sites (1.1 miles from the sound side foraging site to the north side of the inlet versus 0.2 mile from the sound side foraging site to the north side of the inlet; Cohen et al. 2008).

Based on surveys with land managers and biologists, knowledge of local site conditions, and other information, the Service estimated the levels of eight types of disturbance at sites in the U.S. with wintering piping plovers. There are few areas used by wintering piping plovers that are devoid of human presence, and just under half have leashed and unleashed dog presence (Smith 2007; Lott et al. 2009; Maddock and Bimbi unpublished data; Table 8). Data are not available on human disturbance at wintering sites in the Bahamas, other Caribbean countries, or Mexico.

Although the timing, frequency, and duration of human and dog presence throughout the wintering range are unknown, studies in Alabama and South Carolina suggest that most disturbances to piping plovers occur during periods of warmer weather, which coincides with piping plover migration (Johnson and Baldassarre 1988; Lott et al. 2009; Maddock et al. 2009). Smith (2007) documented varying disturbance levels throughout the nonbreeding season at northwest Florida sites.

In South Carolina, 33 percent (13 out of 39) of sites surveyed during the 2007 and 2008 season had ≥ 5 birds. Of those 13 sites, 46.2 percent (6 out of 13) had ≥ 10 people present during surveys, and 61.5 percent (8 out of 13) allow dogs, indicating that South Carolina sites with the highest piping plover density are exposed to disturbance. Only 25.7 percent (9 out of 35) of sites in South Carolina prohibit dogs and restrict public access to the entire site or sections of sites used by piping plovers (Maddock and Bimbi unpublished data). Compliance with the restrictions at these sites is unknown.

LeDee (2008) collected survey responses in 2007 from 35 managers (located in seven states) at sites that were designated as critical habitat for wintering piping plovers. Ownership included Federal, state, and local governmental agencies and nongovernmental organizations managing national wildlife refuges; national, state, county, and municipal parks; state and estuarine research reserves; state preserves; state wildlife management areas; and other types of managed lands. Of 44 reporting sites, 40 allowed public beach access year-round and four sites were closed to the public. Of the 40 sites that allow public access, 62 percent of site managers reported greater than 10,000 visitors during September through March, and 31 percent reported greater than 100,000 visitors. Restrictions on visitor activities on the beach included automobiles (81 percent), all-terrain vehicles (89 percent), and dogs (50 percent) during the winter season. Half of the survey respondents reported funding as a primary limitation in managing piping plovers and other threatened and endangered species at their sites. Other limitations included "human resource capacity" (24 percent), conflicting management priorities (12 percent), and lack of research (3 percent).

Disturbance can be addressed by implementing recreational management techniques such as vehicle and pet restrictions and symbolic fencing (usually sign posts and string) of roosting and feeding habitats. In implementing conservation measures, managers need to consider a range of site specific factors, including the extent and quality of roosting and feeding habitats, and the types and intensity of recreational use patterns. In addition, educational materials such as informational signs or brochures can provide valuable information so that the public understands the need for conservation measures.

In summary, although there is some variability among states, disturbance from human beach recreation and pets pose a moderate to high and escalating threat to migrating and wintering piping plovers. Systematic review of recreation policy and beach management across the nonbreeding range will assist in better understanding cumulative effects. Site specific analysis and implementation of conservation measures should be a high priority at piping plover sites that have moderate or high levels of disturbance, and the Service and state wildlife agencies should increase technical assistance to land managers to implement management strategies and monitor their effectiveness.

Storm events

Although coastal piping plover habitats are storm-created and maintained, the 1996 Atlantic Coast Recovery Plan also noted that storms and severe cold weather may take a toll on piping plovers, and the 2003 Great Lakes Recovery Plan postulated that loss of habitats such as overwash passes or wrack, where birds shelter during harsh weather, poses a threat.

Storms are a component of the natural processes that form coastal habitats used by migrating and wintering piping plovers, and positive effects of storm-induced overwash and vegetation removal have been noted in portions of the wintering range. For example, Gulf Islands National Seashore habitats in Florida benefited from increased washover events that created optimal habitat conditions during the 2004 and 2005 hurricane seasons, with biologists reporting piping plover use of these habitats within 6 months of the storms (Nicholas 2005). In 2005, Hurricane Katrina overwashed the mainland beaches of Mississippi, creating many tidal flats where piping plovers were subsequently observed (Winstead 2008). Hurricane Katrina also created a new inlet and improved habitat conditions on some areas of Dauphin Island, Alabama (LeBlanc 2009). Conversely, localized storms, since Katrina, have induced habitat losses on Dauphin Island (LeBlanc 2009).

Noel and Chandler (2005) suspect that changes in habitat caused by multiple hurricanes along the Georgia coastline altered the spatial distribution of piping plovers and may have contributed to winter mortality of three Great Lakes piping plovers. Following Hurricane Ike in 2008, Arvin (2009) reported decreased numbers of piping plovers at some heavily eroded Texas beaches in the center of the storm affected area and increases in plover numbers at sites about 100 miles to the southwest. However, piping plovers were observed later in the season using tidal lagoons and pools that Ike created behind the eroded beaches (Arvin 2009).

The adverse effects on piping plovers attributed to storms are sometimes due to a combination of storms and other environmental changes or human use patterns. For example, four hurricanes between 2002 and 2005 are often cited in reference to rapid erosion of the Chandeleur Islands, a chain of low-lying islands in Louisiana where the 1991 International Piping Plover Census tallied more than 350 piping plovers. Comparison of imagery taken 3 years before and several days after Hurricane Katrina found the Chandeleur Islands lost 82 percent of their surface area (Sallenger et al. in review), and a review of aerial photography prior to the 2006 Census suggested little piping plover habitat remained (Elliott-Smith et al. 2009). However, Sallenger et al. (in review) noted habitat changes in the Chandeleur Islands stem not only from the effects of these storms, but rather from the combined effects of the storms, long-term (greater than 1,000 years) diminishing sand supply, and sea level rise relative to the land.

Other storm-induced adverse effects include poststorm acceleration of human activities such as beach nourishment, sand scraping, and berm and seawall construction. Such stabilization activities can result in the loss and degradation of feeding and resting habitats. Storms can also cause widespread deposition of debris along beaches. Removal of debris often requires large machinery, which can cause extensive disturbance and adversely affect habitat elements such as wrack. Another example of indirect adverse effects linked to a storm event is the increased access to Pelican Island (LeBlanc 2009) due to merging with Dauphin Island following a 2007 storm (Gibson et al. 2009).

Recent climate change studies indicate a trend toward increasing hurricane numbers and intensity (Emanuel 2005; Webster et al. 2005). When combined with predicted effects of sea level rise, there may be increased cumulative effects from future storms.

In summary, storms can create or enhance piping plover habitat while causing localized losses elsewhere in the wintering and migration range. Available information suggests some birds may have resiliency to storms and move to unaffected areas without harm, while other reports suggest birds may perish from storm events. Significant concerns include disturbance to piping plovers and habitats during cleanup of debris, and poststorm acceleration of shoreline stabilization activities which can cause persistent habitat degradation and loss.

Summary

Habitat loss and degradation on winter and migration grounds from shoreline and inlet stabilization efforts, both within and outside of designated critical habitat, remains a serious threat to all piping plover populations. In some areas, beaches that abut private property are needed by wintering and migrating piping plovers. However, residential and commercial developments that typically occur along private beaches may pose significant challenges for efforts to maintain natural coastal processes. The threat of habitat loss and degradation, combined with the threat of sea level rise associated with climate change, raise serious concerns regarding the ability of private beaches to support piping plovers over the long term.

Future actions taken on private beaches will determine whether piping plovers continue to use these beaches or whether the recovery of piping plovers will principally depend on public property. As Lott (2009) concludes, "The combination of development and shoreline protection seems to limit distribution of non-breeding piping plovers in Florida. If mitigation or habitat restoration efforts on barrier islands fronting private property are not sufficient to allow plover use of some of these areas, the burden for plover conservation will fall almost entirely on public land managers."

While public lands may not be at risk of habitat loss from private development, significant threats to piping plover habitat remain on many municipal, state, and federally owned properties. These public lands may be managed with competing missions that include conservation of imperiled species, but this goal frequently ranks below providing recreational enjoyment to the public, readiness training for the military, or energy development projects.

Public lands remain the primary places where natural coastal dynamics are allowed. Of recent concern are requests to undertake beach nourishment actions to protect coastal roads or military infrastructure on public lands. If project design does not minimize impediments to shoreline overwash which are necessary to help replenish bayside tidal flat sediments and elevations, significant bayside habitat may become vegetated or inundated, thereby exacerbating the loss of preferred piping plover habitat. Conversely, if beach fill on public lands is applied in a way that allows for "normal" system overwash processes, and sediment is added back to the system, projects may be less injurious to barrier island species that depend on natural coastal dynamics.

Maintaining wrack for food and cover in areas used by piping plovers may help offset effects that result from habitat degradation due to sand placement associated with berm and beach

nourishment projects and ensuing human disturbance. Leaving wrack on private beaches may improve use by piping plovers, especially during migration when habitat fragmentation may have a greater effect on the species. In addition, using recreation management techniques, Great Lakes recovery action 2.14 may minimize the effects of habitat loss. Addressing off-road vehicles and pet disturbance may increase the suitability of existing piping plover habitat.

Analysis of the species/critical habitat likely to be affected

In a letter dated March 13, 2012, the Corps determined the proposed project "may affect" the threatened loggerhead sea turtle, endangered leatherback sea turtle, endangered green sea turtle, endangered hawksbill sea turtle, and endangered Kemp's ridley sea turtle, "may affect, but is not likely to adversely affect", the endangered West Indian manatee, and "will not affect" beach mice.

On August 22, 2011, the Service issued a Statewide Programmatic Biological Opinion (SPBO) to the Corps to address potential adverse effects to nesting sea turtles and the West Indian manatee as a result of sand placement activities proposed along the coast of Florida (Service 2011). The SPBO includes avoidance and minimization measures, Reasonable and Prudent Measure, and Terms and Conditions to ensure adverse effects to the covered species are avoided and minimized to the maximum extent practicable. Since the proposed activities associated with maintenance dredging of Matanzas Pass are covered in the SPBO and the Corps and Lee County (Sponsor) have agreed to implement the protection measures described in the SPBO, the Service has determined the proposed project is consistent with the SPBO, and the Service concurs with the Corps' determinations. However, only the Reasonable and Prudent Measures and Terms and Conditions in section A and B of the SPBO will apply to the Sponsor and Corps, respectively. This concludes our consultation for nesting sea turtles, and West Indian manatees. Beach mice are not present in the action area. Based on this information, the Service concurs with the Corps' determinations listed above.

The proposed action has the potential to adversely affect wintering and migrating piping plovers and their habitat from all three populations that may use the action area. The Atlantic Coast nesting population of piping plover is a component of the entity listed as threatened, which encompasses all breeding piping plovers (Great Plains and Atlantic) except the Great Lakes breeding population. Therefore, this Biological Opinion considers the potential effects of this project on this species and its designated critical habitat.

This Biological Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 C.F.R. 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

ENVIRONMENTAL BASELINE

Status of the species/critical habitat within the action area

The action area is located within a portion of Critical habitat Unit FL-25, named Bunche Beach, Lee County, Florida, which comprises approximately 461 acres along Bunche Beach adjacent to San Carlos Bay between Sanibel Island and Estero Island, and the northern region of Estero Island including the Park. The critical habitat unit includes land from mean lower low water

(MLLW) to where densely vegetated habitat or developed structures, not used by piping plovers, begin and where the PCEs no longer occur or, along the developed portion of Estero Island. The PCEs consist of intertidal flats including sand or mud flats with no or very sparse emergent vegetation. In addition, adjacent unvegetated or sparely vegetated sand, mud, or algal flats above high tide are important.

Based on the 2009 dredging event, the Corps quantified the pre- and postdredging area of piping plover critical habitat. In addition, the area of piping plover critical habitat was measured annually postdredging to determine the maximum area of piping plover critical habitat directly affected from the project. Also, the quality of the habitat was assessed based on whether or not the habitat is located in Critical Habitat Unit FL-25 and located along undeveloped shoreline, the amount of human use and disturbance, and any reported use of the habitat by piping plovers. The Corps was to use the above stated information to determine the acreage of critical habitat lost which may be offset during future maintenance dredging events. Based on these surveys, the most recent aerial imagery obtained in September 2011, construction of a rock groin, and a beach renourishment project conducted on the northwest edge of Estero Island, the current maintenance dredging event is estimated to directly affect approximately 3.2 acres of designated critical habitat on Bowditch Point, Estero Island, Lee County, Florida. Of the 27,328 acres of designated critical habitat for wintering piping plovers in Florida outlined in the July 10, 2001 FR, the 3.2 acres directly affected by the proposed project represents 0.01 percent.

Bird populations in Bowditch Point Regional Park are monitored by volunteers. The number of birds, by species, is submitted annually to http://ebird.org (Lee County 2008). Launched in 2002, by the Cornell Lab of Ornithology and National Audubon Society, eBird provides data concerning bird abundance and distribution at a variety of spatial and temporal scales. eBird is sponsored in part by several Service programs, research groups, non-government offices, and the University of the Virgin Islands. The number of piping plovers reported in the Park between 2005 and 2009, ranged from 1 to 7, and from 2 to 15 during 2011. In addition, piping plover PCEs are present throughout the proposed action area.

Efforts to avoid and reduce adverse effects

The Service often requests postproject surveys and eradication of coastal exotic plant species in Florida as permit conditions for beach berm or nourishment projects to reduce affects to piping plover habitat. Four recent Biological Opinions for sand placement events in Florida included requirements that restricted the removal of wrack to minimize project effects (Service 2007b, 2008c, 2008d, 2008e). A statewide consultation with the Federal Emergency Management Agency to minimize emergency berm repair and construction projects in Florida was completed in 2008 (Service 2008c). In Texas, four Biological Opinions required avoidance and minimization measures for beach maintenance, oil and gas activities, and inlet dredging and stabilization projects (Service 2003b, 2003c, 2008f, 2009). Terms and conditions included restricted activities in the coastal foredunes, restoration of beach elevations postproject, reductions in oil and gas leaks from vehicles, avoidance of driving in the swash zone (wet sand where water washes onto the shore after an incoming wave has broken), requirements to keep dogs on leashes, and avoidance of work during inclement weather when piping plovers are roosting.

Section 10(a)(2)(A) of the Act requires an applicant for an incidental take permit to submit a conservation plan that specifies, among other things, the effects that are likely to result in the taking and the measures the applicant will undertake to minimize and mitigate such effects. Incidental take of piping plovers associated with beach driving activities in Volusia County, Florida, were addressed in a Habitat Conservation Plan (HCP) (EAI 2005). Minimization efforts within the HCP include daytime driving only, 10 mile-per-hour speed limits, a no-drive area in critical habitat, and seasonal field surveys. Three other Florida county governments (Gulf, Escambia, and Walton) are in various stages of drafting HCPs for beach driving, coastal developments, and associated activities. All three consultations include consideration of effects on piping plovers.

Coordinated efforts for several large projects are currently underway. Florida Service field offices are engaged in statewide programmatic consultation on Florida coastal Corps projects and permitting (dredging, jetty maintenance, and nourishment). Also, DEP and FWC are drafting a statewide HCP for coastal actions permitted through the DEP. The primary purpose of this plan is to minimize or mitigate habitat affects associated with wrack removal, seawall installation, and geotube placement.

As noted above, some project sponsors have incorporated recommended avoidance and minimization measures. Nonetheless, considerable challenges remain. Other project sponsors have not reacted positively to Service recommendations, citing financial costs and engineering restrictions.

Several projects have resulted in formal consultation for piping plovers or their designated critical habitat in Florida (Table 9).

Factors affecting the species environment within the action area

Matanzas Pass is a Federal navigation channel utilized by shrimp and finfish fleets and by the U.S. Coast Guard. In addition, the channel is used by both commercial and recreational fishers and boaters. The channel was maintenance dredged in 1986, 1996, 2001, and 2009. The maintenance dredging events conducted between 1986 and 2001 involved both a beach and nearshore sand placement components. In 2009, approximately 229,313 cy of material was dredged with all dredge material placed in the nearshore area. Since the last dredging event in 2009, the most recent survey documented approximately 120,000 cy of accreted material within the authorized Federal channel. Based on maintenance dredging activities, piping plovers and critical habitat have the potential to be affected due to habitat loss, sand placement, groin construction, wrack removal, predation, contaminants, recreational disturbance, and storm events within the action area.

EFFECTS OF THE ACTION

Factors to be considered

Beach topography and morphology

The geomorphic characteristics of barrier islands, peninsulas, beaches, dunes, overwash fans, and inlets are critical to a variety of natural resources and influences a barrier beach's ability to respond to wave action, including storm overwash and sediment transport. However, the

protection or persistence of these important natural land forms, processes, and wildlife resources is often in conflict with shoreline projects. The manufactured berms and sand fill may impede overwash thereby causing successional advances in the habitat that will reduce sand flat formation, and therefore, its use by piping plovers in the project area.

Distribution

The Corps and Sponsor propose dredging and sand placement activities within the authorized Federal channel, and along the shoreline between DEP reference monuments R-178 and R-184 or within a nearshore placement area, respectively. The Service expects the proposed construction activities could directly and indirectly affect the distribution of migrating and wintering piping plovers to roosting and foraging habitat, and to Critical Habitat Unit FL-25 within the action area.

Disturbance frequency and intensity

The proposed action has the potential to adversely affect piping plovers and Critical Habitat Unit FL-25 within the proposed action area during dredging and sand placement activities within and south of Matanzas Pass, Lee County, Florida. Dredging and sand placement are proposed to take place approximately every 3-5 years.

The Service anticipates construction activities to have short-term and temporary effects on the piping plover populations. Piping plovers located within the action area are expected to move outside of the construction zone due to disturbance. Long-term effects are expected due to the loss of PCEs located in Critical Habitat Unit FL-25.

Duration

The frequency of dredging and sand placement activities is anticipated to be completed within approximately 2 to 6 months for each event although this timeframe may vary depending on the amount of work necessary, weather conditions, and equipment mobilization and maintenance. Commencement of the next dredge and sand placement event is scheduled to occur in late summer 2012.

Nature of the effect

Although the Service expects short-term effects from disturbance during project construction, it is anticipated that the action will result in direct, indirect and long term effects to piping plovers and critical habitat. The Service expects that there may be morphological changes to piping plover habitat due to the effects to loafing and foraging habitat, and critical habitat within the action area. Activities that affect or alter the use of optimal habitat, critical habitat, or increase disturbance to the species may decrease the survival and recovery potential of the piping plover.

Timing

The timing of the dredging and sand placement project may occur completely or partially during the migration and wintering period for piping plovers (July 15 to May 15). The Service expects indirect effects to occur later in time.

Analyses for effects of the action

The proposed project includes dredging approximately 120,000 – 150,000 cy of beach compatible material from the authorized Federal channel and placing it in a nearshore placement area or along approximately 1.1 miles of shoreline. If the dredged material is placed on the beach, it has the potential to elevate the beach berm and widen the beach providing storm protection and increasing recreational space. Sand placement may occur in and adjacent to habitat that appears suitable for roosting and foraging piping plovers or that will become more optimal with time. Project construction may overlap with portions of piping plover winter and migration seasons. Short-term and temporary construction effects to piping plovers will occur if the birds are roosting and feeding in the area during a migration stopover. The deposition of sand may temporarily deplete the intertidal food base along the shoreline and temporarily disturb roosting birds during project construction. Tilling to loosen compaction of the sand required to minimize sea turtle effects may affect wrack that has accumulated on the beach. This affects feeding and roosting habitat for piping plovers since they often use wrack for cover and foraging.

PCEs located in the project area which encompasses a portion of piping plover Critical Habitat Unit FL-25 will be affected by the proposed action. The dredging event is expected to affect portions of the project area for the life of the project; however, the exact acreage of critical habitat affected by routine dredging will not be determined until the area has equilibrated several years postconstruction. The area of critical habitat will be measured annually for a total of 5 years postconstruction, after which the maximum area of critical habitat affected by the project will be determined.

Direct effects

Direct effects are those direct or immediate effects of a project on the species or its habitat. Dredging activities are expected to result in the loss of approximately 3.2 acres of coastal habitat and piping plover Critical Habitat Unit FL-25. In addition, excavation of 3.2 acres of piping plover Critical Habitat Unit FL-25, may adversely affect wintering piping plovers in the project area by disruption of normal activities such as roosting and foraging, and possibly forcing birds to expend energy reserves to seek available habitat in adjacent areas along the shoreline.

The construction window (*i.e.*, sand placement, dredging) for each dredging event will extend through a portion of one piping plover migration and winter season. If the dredged material is placed on the beach, heavy machinery and equipment (*e.g.*, trucks and bulldozers operating on action area beaches, the placement of the dredge pipeline, and sand placement) may adversely affect migrating and wintering piping plovers in the action area by disturbing and disrupting normal activities such as roosting and feeding, and possibly forcing birds to expend valuable energy reserves to seek available habitat in adjacent areas along the shoreline. In addition, suffocation of invertebrate species will occur. Impacts will affect the entire fill template (1.1 miles) along the project area, as well as at some downdrift areas. Timeframes projected for benthic recruitment and re-establishment following sand placement are between 6 months and 2 years, depending on actual recovery rates. Effects will occur even if sand placement activities occur outside the piping plover migration and wintering seasons.

Indirect effects

The proposed project may include placing beach-compatible sand dredged from the authorized Federal channel along 1.1 miles of shoreline between DEP reference monument R-178 and R-184. Indirect effects of reducing the potential for the formation of optimal habitats, especially along the shorelines pose a concern to piping plover survival and recovery within the action area.

Eventually the shoreline within the fill template will reestablish and provide some feeding habitat for piping plovers, but these feeding areas are considered inferior to natural overwash and emergent shoal habitat that is likely to form within sections of the action area absent the proposed project.

Natural barrier islands need storms and overwash in order to maintain the physical and biological environments they support (Young et al. 2006). The removal of overwash processes will accelerate the successional state of the flats such that they will likely become vegetated within a few years (Leatherman 1988), thereby reducing the area's value to foraging and roosting piping plovers. The proposed project will perpetuate and contribute to the widespread activities that prevent the formation of these preferred early successional overwash habitats. The piping plover's rapid response to habitats formed by washovers from the hurricanes in 2004 and 2005 in the Florida panhandle at Gulf Islands National Seashore and Eglin Air Force Base's Santa Rosa Island and similar observations of their preferences for overwash habitats at Phipps Preserve and Lanark Reef in Franklin County, Florida, and elsewhere in their range, demonstrate the importance of optimal habitats for wintering and migrating piping plovers.

At the same time the proposed project limits the creation of optimal foraging and roosting habitat, it increases recreational pressures within the project area. Recreational activities that have the potential to adversely affect piping plovers include disturbance by increased pedestrian use, often with dogs. Long-term effects could include a decrease in piping plover use of habitat due to increased disturbance levels.

Dredging of Matanzas Pass will allow for an increase in boat traffic close to Bowditch Point and may also encourage more recreational boaters to land on the point. These activities, and the associated pedestrian and possible domestic canine presence, may adversely affect the foraging and roosting behavior of piping plovers.

Dredging Matanzas Pass will increase the tidal flow between the Gulf of Mexico and San Carlos Bay. Along the updrift shoreline, wave energy will transport sediment alongshore and direct it toward the Pass. During ebb tide, sediment will accumulate at the seaward side of the Pass. During flood tide, sediment will be transported into San Carlos Bay. Flood or ebb dominance of water flow through a pass does not necessarily determine the net sediment transport direction. If a pass were in a state of dynamic equilibrium, it would indicate a balance between sediment transport to and from the pass. However, short-term events such as storms and seasonal changes in waves and currents can temporarily disrupt this balance. Consequently, Matanzas Pass will require regular dredging to maintain navigability. This regular dredging will preclude the creation of inlet formations piping plovers use for foraging and roosting.

Beneficial effects

There are no known beneficial effects to piping plovers or piping plover habitat from the proposed project.

Species' response to the proposed action

The Service bases this Biological Opinion on anticipated direct and indirect effects to piping plovers (wintering and migrating) as a result of maintenance dredging of the authorized Federal channel and possible sand placement, which prevents the maintenance or formation of habitat that piping plovers consider optimal for foraging and roosting. Heavy machinery and equipment (*e.g.*, trucks and bulldozers operating on project area beaches, the placement of the dredge pipeline along the beach, and sand disposal) may adversely affect migrating and wintering piping plovers in the project area by disturbance and disruption of normal activities such as roosting and forging, and possibly forcing piping plovers to expend valuable energy reserves to seek available habitat elsewhere. In addition, foraging in suboptimal habitat by migrating and wintering piping plovers may reduce the fitness of individuals. Furthermore, increased and continual disturbance within Critical Habitat Unit FL-25 could have effects to possibly all three breeding populations of piping plovers, especially those stopping to replenish energy reserves during migration.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Since most activities affecting Critical Habitat Unit FL-25 would require Federal permits or funding, the Service is unable to identify any activities that would be considered cumulative effects.

CONCLUSION

There are a total of 27,328 acres of designated piping plover critical habitat in Florida. Direct effects to 3.2 acres of Critical Habitat Unit FL-25 represents 0.01 percent of available critical habitat in Florida. The loss is insignificant considering the entire non-breeding range of the species. In addition, the 1.1 miles of shoreline represents approximately 0.05 percent of the 2,340 miles of sandy beach shoreline miles available (although not necessarily suitable) throughout the piping plover wintering range within the conterminous U.S. The Service estimates 29 percent (668 miles preproject) have permits for sand placement events.

After reviewing the current status of the northern Great Plains, Great Lakes, and Atlantic Coast wintering piping plover populations, the environmental baseline for the dredging, sand placement, associated construction activities, and the cumulative effects, it is the Service's biological opinion that implementation of the project, as proposed, is not likely to jeopardize the continued existence of the piping plover.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered or threatened species without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are nondiscretionary, and must be implemented by the Corps so they become binding conditions of any permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to assume and implement the Terms and Conditions or, (2) fails to adhere to the Terms and Conditions of the incidental take statement through enforceable terms that are added to the permit, the protective coverage of section 7(o)(2) may lapse. In order to monitor the effects of incidental take, the Corps must report the progress of the action and its effects on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

The Service anticipates that an unspecified number of piping plovers occupying 1.1 miles of shoreline and 3.2 acres of Critical Habitat Unit FL-25 within the maintenance dredge and optional sand fill template (between DEP reference monument R-178 and R-184) could be taken in the form of harm (*e.g.*, death, injury) and harassment as a result of the proposed project.

The amount or extent of incidental take for piping plovers will be considered exceeded if the frequency of maintenance dredging and sand placement events exceeds more than one event every 3-5 years. Expiration of this incidental take statement will coincide with the expiration of the DEP permit. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

EFFECT OF THE TAKE

In this Biological Opinion, the Service determined the proposed project is not likely to result in jeopardy to piping plovers or result in destruction or adverse modification of critical habitat.

REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of nonbreeding piping plovers in the proposed action area.

1. The Corps shall minimize and monitor the effects of the proposed project on piping plovers.

2. After project completion, the Corps shall ensure the Sponsor protects wrack and inlet shorelines for roosting and foraging piping plovers.

3. The Corps shall ensure the Sponsor educates the public to minimize disturbance to piping plovers.

4. The Corps and Sponsor shall comply with the MBTA and FWC's shorebird guidelines.

5. The Corps shall ensure the Sponsor minimizes the presence of predators.

6. The Corps shall ensure communication between all parties is carried out.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Corps and Sponsor must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting and monitoring requirements. These terms and conditions are nondiscretionary.

1. Three months prior to construction and for the 3 years following each dredging and sand placement event, the Sponsor must conduct bi-monthly (twice-monthly) surveys for piping plovers in the beach fill and dredging templates within the action area covering the nonbreeding season for plovers (July 15 to May 15 of each year) to monitor and quantify the level of take associated with the project and to evaluate the potential effects of future projects of similar nature. At least one of the bi-monthly surveys should be conducted on a weekend during each of the months of October, November, March and April.

   Piping plover identification, especially when in non-breeding plumage, can be difficult. Qualified professionals with shorebird/habitat survey experience must conduct the required field work.

   The following will be collected and reported:
   a. Negative and positive survey data.
   b. The amount and type of recreational use (*e.g.*, people, dogs on-off leash, vehicles, kite-boarders).
   c. Piping plover locations with a Global Positioning System (decimal degrees preferred).

d. Habitat feature(s) used by piping plovers when observed (*e.g.,* intertidal, fresh wrack, old wrack, dune, mid-beach, vegetation).
e. Landscape feature(s) where piping plovers are located (*e.g.,* Gulf beach, inlet spit, tidal creek, shoals, lagoon shoreline).
f. Substrate used by piping plovers (*e.g.,* sand, mud/sand, mud, algal mat).
g. Behavior of piping plovers (*e.g.,* foraging, roosting, preening, bathing, flying, aggression, walking).
h. Color bands observed on piping plovers.
i. All other shorebirds/waterbirds seen within the survey area.

All information shall be incorporated into a database. Submit pre-and postconstruction piping plover monitoring results (datasheets, maps, database) on standard electronic media (*e.g.,* CD, DVD) to the FWC, and to the Service's South Florida Ecological Services Office (1339 20th Street, Vero Beach, Florida 32960-3559; 772-562-3909). All reports will be due by December 1 following the end of the nonbreeding season for plovers (July 15) of each year.

2. To preserve piping plover feeding and roosting habitat, the Sponsor shall limit mechanical cleaning of the dry sand portion of the beach to areas landward of the primary wrack (organic material) line as reasonable determined by the sponsor for the life of the project. This has been identified as important foraging and roosting habitat by piping plovers as well as an abundance of other shorebirds for wintering and migrating. Trash and litter within the wrack line area may be manually removed. Mechanical removal of wrack may be authorized when the Sponsor documents a fish kill event, or when the health of humans may be affected. The Sponsor will notify the Service via phone or electronic mail when wrack removal is necessary.

3. The Sponsor shall produce piping plover and wrack-oriented educational materials to be placed on the County's website and television channel. The goal of these outreach activities is to educate the public about piping plover optimal habitat, the role of natural coastal processes in creating and maintaining piping plover habitat, and the importance of wrack. Some of the educational information will be included in a preconstruction news release.

4. Due to the potential for the proposed project to affect piping plovers, the Corps and Sponsor shall comply with the MBTA and follow FWC's standard guidelines to protect against effects to nesting shorebirds during implementation of the proposed project during the periods from February 15 to August 31. In part, these guidelines include the establishment of buffer zones in locations where shorebirds have been engaged in nesting behavior, including territory defense.

   4a. The Sponsor shall coordinate with the Park concerning the placement of signs within the action area to protect piping plover habitat. In addition, the Sponsor will coordinate with Bowditch Point Park to ensure that provisions of Lee County Animal Control Ordinance, Section 13, prohibiting dogs or other domestic animals to run at large unless they are leashed are fulfilled. If possible, warnings and citations will be issued when appropriate to minimize harassment of piping plovers and other shorebirds protected under the MBTA.

5. The Corps or Sponsor shall ensure the contractors conducting the work provide predator proof trash receptacles for all construction workers. All contractors and their employees shall be briefed on the importance of not littering and keeping the project area trash and debris free. Predator proof trash receptacles shall be installed and maintained at all access points, eating areas, and restroom areas.

6. The Corps shall submit a report describing the actions taken to implement the terms and conditions of this incidental take statement to the FWC, Imperiled Species Management Section, Tallahassee office and the Service's South Florida Ecological Services Office, Vero Beach, Florida within 60 days postconstruction of each event.

    6a. The Corps must arrange a meeting between representatives of the contractor, the Service, the FWC, and the shorebird surveyor(s) prior to the commencement of the project and prior to each future event.

Upon locating a dead, injured, or sick threatened piping plover specimen, initial notification must be made to the Service's Office of Law Enforcement (10426 NW 31st Terrace, Miami, Florida 33172; 305-526-2610). Additional notification must be made to FWC at 1-888-404-3922 and the Service's South Florida Ecological Services Office (1339 20th Street, Vero Beach, Florida 32960-3559; 772-562-3909). Care should be taken in handling sick or injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure evidence intrinsic to the specimen is not unnecessarily disturbed.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. To further protect piping plover habitat and reduce beach erosion, the Sponsor should consider protecting the wrack throughout the project area in perpetuity.

2. The Sponsor should consider purchasing land for piping plover conservation which could include locations where natural shoreline processes can occur unimpeded. These could include not only undeveloped areas, but the potential "buy-out" of developments in areas that are sparsely developed or have been significantly affected by hurricanes that have high potential habitat value (*e.g.*, proximity to feeding areas, close to coastal dune outlets).

3. Maintenance dredging and sand placement activities for this and similar future projects should be scheduled outside the main part of the piping plover wintering season (July 15 to May 15).

4. Future maintenance dredging of Matanzas Pass should occur before accretion causes Bowditch Point to extend into the authorized Federal channel above the MLLW.

5. Consider realigning the authorized Federal channel to a location less apt to silt in as rapidly.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

THE MIGRATORY BIRD TREATY ACT

The MBTA implements various treaties and conventions between the U.S., Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the provisions of the MBTA, it is unlawful "by any means or manner to pursue, hunt, take, capture or kill any migratory bird except as permitted by regulations issued by the Service. The term "take" is not defined in the MBTA, but the Service has defined it by regulation to mean to pursue, hunt, shoot, wound, kill, trap, capture or collect any migratory bird, or any part, nest or egg or any migratory bird covered by the conventions or to attempt those activities.

In order to comply with the MBTA and due to the potential for this project to affect nesting shorebirds, the Corps and Sponsor should follow FWC's standard guidelines to protect against effects to nesting shorebirds during implementation of this project during the periods from February 15 to August 31.

The Service will not refer the incidental take of piping plover for prosecution under the MBTA of 1918, as amended (16 U.S.C. 703-712), if such take is in compliance with the terms and conditions specified in the incidental take statement above.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if:

1. The amount or extent of incidental take is exceeded. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion.

3. The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion.

4. A new species is listed or critical habitat designated that may be affected by the action.

Should you have additional questions or require clarification, please contact Jeff Howe at 772-469-4283.

Sincerely yours,

for Larry Williams
Field Supervisor
South Florida Ecological Services Office

cc: electronic only
Corps, Jacksonville, Florida (Paul DeMarco, Kathleen McConnell)
DEP, Tallahassee, Florida (Lanie Edwards)
EPA, West Palm Beach, Florida (Ron Miedema)
FWC, Imperiled Species Management Section, Tallahassee, Florida (Robbin Trindell)
NOAA Fisheries, St. Petersburg, Florida (Mark Sramek)
Service, Panama City, Florida (Patty Kelly)
Service, St. Petersburg, Florida (Anne Marie Lauritsen)
Service, Atlanta, Georgia (Ken Graham)
USGS, Florida Integrated Science Center, Gainesville, Florida (Susan Walls)

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Table 1. The number of adult piping plovers and breeding pairs reported in the U.S. Northern Great Plains by the International Piping Plover Census efforts.

Year	Adults	Pairs Reported by the Census
1991	2,023	891
1996	1,599	586
2001	1,981	899
2006	2,959	1,212

Source: Plissner and Haig 1997; Ferland and Haig 2002; Elliot-Smith et al. 2009.

Table 2. Results of the 1991, 1996, 2001, and 2006 International Piping Plover Winter Censuses (Haig et al. 2005; Elliott-Smith et al. 2009).

Location	1991	1996	2001	2006
Virginia	Not surveyed	Not surveyed	Not surveyed	1
North Carolina	20	50	87	84
South Carolina	51	78	78	100
Georgia	37	124	111	212
Florida	**551**	**375**	**416**	**454**
Atlantic	70	31	111	133
Gulf	481	344	305	321
Alabama	12	31	30	29
Mississippi	59	27	18	78
Louisiana	750	398	511	226
Texas	1,904	1,333	1,042	2,090
Puerto Rico	0	0	6	Not surveyed
U.S. Total	**3,384**	**2,416**	**2,299**	**3,355**
Mexico	27	16	Not surveyed	76
Bahamas	29	17	35	417
Cuba	11	66	55	89
Other Caribbean Islands	0	0	0	28
GRAND TOTAL	**3,451**	**2,515**	**2,389**	**3,884**
Percent of Total International Piping Plover Breeding Census	62.9	42.4	40.2	48.2

Table 3. Number of hardened inlets by state as of 2009. An asterisk (*) represents an inlet at the state line, in which case half an inlet is counted in each state.

State	Visually estimated number of navigable mainland and barrier island inlets per state	Number of hardened inlets	Percent of inlets affected
North Carolina	20	2.5*	12.5
South Carolina	34	3.5*	10.3
Georgia	26	2	7.7
Florida	82	41	50
Alabama	14	6	42.9
Mississippi	16	7	43.8
Louisiana	40	9	22.5
Texas	17	10	58.8
Overall Total	249	81	32.5

Table 4. Summary of the extent of nourished beaches in piping plover wintering and migrating habitat within the conterminous U.S. From Service unpublished data.

State	Sandy beach shoreline miles available	Sandy beach shoreline miles nourished to date (within critical habitat units)	Percent of sandy beach shoreline affected (within critical habitat units)
North Carolina	301[1]	117[5] (unknown)	39 (unknown)
South Carolina	187[1]	56 (0.6)	30 (0.32))
Georgia	100[1]	8 (0.4)	8 (0.40)
Florida	825[2]	404 (6)[6]	49 (0.72)
Alabama	53[1]	12 (2)	23 (3.77)
Mississippi	110[3]	≥6 (0)	5 (0)
Louisiana	397[1]	Unquantified (usually restoration-oriented)	Unknown
Texas	367[4]	65 (45)	18 (12.26)
Overall Total	2,340 (does not include Louisiana)	≥ 668 does not include Louisiana (54)	29 (≥2.31)

Data from [1]www.50states.com; [2] Clark 1993; [3]Winstead 2008; [4] www.surfrider.org; [5] Hall 2009; [6] partial data from Lott et al. (in review).

Table 5. Summary of predator control programs that may benefit piping plovers on winter and migration grounds.

State	Entities with Predator Control Programs
North Carolina	State Parks, Cape Lookout and Cape Hatteras National Seashores.
South Carolina	As needed throughout the state-targets raccoons and coyotes.
Georgia	No known programs.
Florida	Merritt Island NWR, Cape Canaveral AFS, Indian River County, Eglin AFB, Gulf Islands NS, northwest Florida state parks (up until 2008), St. Vincent NWR, Tyndall AFB.
Alabama	Late 1990's Gulf State Park and Orange Beach for beach mice, none current.
Mississippi	No known programs.
Louisiana	No known programs.
Texas	Aransas NWR (hog control for habitat protection). Audubon (mammalian predator control on colonial waterbird islands that have occasional piping plover use).

Table 6. Number of sites surveyed during the 2006 winter International Piping Plover Census with hardened or developed structures adjacent to the shoreline.

State	Number of sites surveyed during the 2006 winter Census	Number of sites with some armoring or development	Percent of sites affected
North Carolina	37 (+2)[1]	20	51
South Carolina	39	18	46
Georgia	13	2	15
Florida	188	114	61
Alabama	4 (+2)[1]	3	50
Mississippi	16	7	44
Louisiana	25 (+2)[1]	9	33
Texas	78	31	40
Overall Total	406	204	50

[1] Indicates additional piping plovers sites not surveyed in the 2006 Census.

Table 7. Military bases that occur within the wintering/migration range of piping plovers and contain piping plover habitat. Five bases (indicated with an asterisk [*]) conduct activities that may affect piping plovers or their habitat.

State	Coastal Military Bases
North Carolina	Camp Lejeune*
South Carolina	No coastal beach bases
Georgia	Kings Bay Naval Base
Florida	Key West Base, Naval Station Mayport*, Cape Canaveral Air Force Station, Patrick AFB, MacDill AFB, Eglin AFB*, Tyndall AFB*
Alabama	No coastal beach bases
Mississippi	Keesler AFB
Louisiana	U.S. Navy* operations on Peveto Beach
Texas	Corpus Christi Naval Air Station

Table 8. Percent of known piping plover winter and migration habitat locations, by state, where various types of anthropogenic disturbance have been reported.

	Percent by State							
Disturbance Type	**AL**	**FL**	**GA**	**LA**	**MS**	**NC**	**SC**	**TX**
ATVs	0	35	0	25	0	17	25	30
Bikes	0	19	63	25	0	0	28	19
Boats	33	65	100	100	0	78	63	44
Dogs on leash	67	69	31	25	73	94	25	25
Dogs off leash	67	81	19	25	73	94	66	46
Kite surfing	0	10	0	0	0	33	0	0
ORVs	0	21	0	25	0	50	31	38
Pedestrians	67	92	94	25	100	100	88	54

Table 9. Biological Opinions issued for all projects that had adverse effects to the piping plovers on non-breeding grounds in Florida.

SPECIES Piping plover	YEAR	Habitat Impacted (miles or acres)	PROJECT STATUS
East Pass re-opening	2001	2.0 miles	Completed
Amended Biological Opinion for south jetty extension in Ponce De Leon Navigation Inlet.	2003	Shoal habitat	Completed
Terminal groin and nearshore breakwater on the south end of Amelia Island, Nassau, Florida.	2004	Shoal habitat	Completed
Navarre beach nourishment emergency consultation and amendments 1-6.	2005	4.1 miles	Project completed, consultation incomplete.
Eglin AFB INRMP	2007-2011	17 miles (disturbance/ monitoring)	Completed
Tyndall AFB INRMP	2007-2011	18 miles (disturbance/ monitoring)	Completed
St. Joseph Peninsula beach restoration	2007	7.5 miles	Consultation complete, project completed.
Alligator Point beach nourishment	2007	2.9 nourished, add 1.5 disturbed (miles)	Consultation complete, project cancelled.
NAS Pensacola pass dredging and spoil placement	2007	10.6 miles	Consultation ongoing.
FEMA emergency berm repair for Florida coast	2008	50 miles (statewide)	Consultation complete.
Eglin AFB nourishment	2008	7.3 miles	Consultation complete, project pending.
Perdido Key beach nourishment: Escambia County.	2008	6.5 miles	Consultation complete, project pending.
Beach nourishment, Walton County	2008	14.1 miles	Consultation complete, project pending.
East Pass Destin Navigation Project	2009	Inlet dredge and 2.1 miles of shoreline	Consultation complete, project pending.
Matanzas Pass re-opening, Lee County.	2009	3.6 acres of Critical Habitat Unit FL-25	Consultation complete, project pending.
Hideaway Beach Erosion Control Project, Collier County.	2009	2.5 acres of Critical Habitat Unit FL-27	Consultation and project completed.
St. Lucie Inlet dredging and sand placement, Martin County	2011	3.8 acres of Critical Habitat Unit FL-33, and 8.5 miles	Consultation complete.

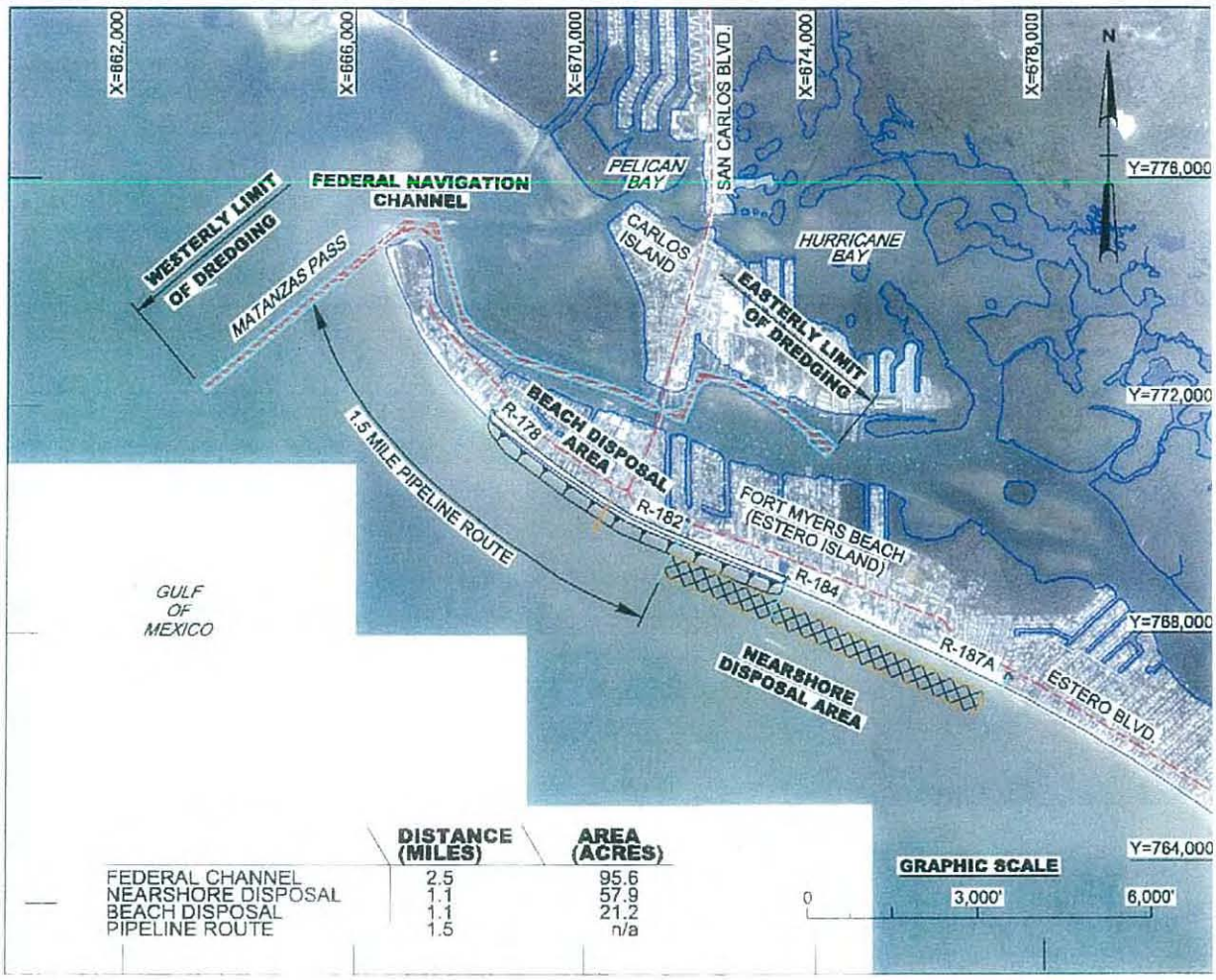

Figure 1. Location of the dredging template, nearshore disposal area, and beach disposal area associated with the proposed maintenance dredging project to reopen Matanzas Pass, Estero Island, Lee County, Florida.

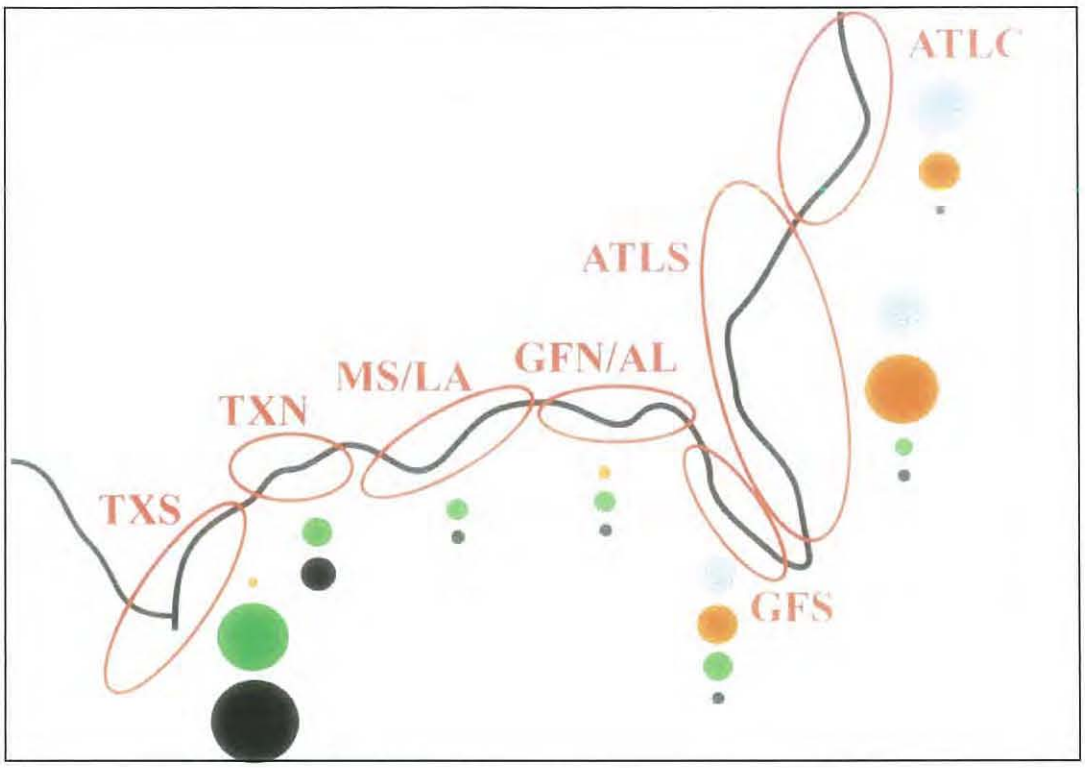

Figure 2. Breeding population distribution in the wintering/migration range. Grey circles represent Eastern Canada birds, Orange U.S. Great Lakes, Green U.S. Great Plains, and Black Prairie Canada. ATLC=Atlantic (eastern) Canada; GFS=Gulf Coast of southern Florida; GFN=Gulf Coast of north Florida; AL=Alabama; MS/LA=Mississippi and Louisiana; TXN=northern Texas; and TXS=southern Texas. From Gratto-Trevor et al. 2009; reproduced by permission.

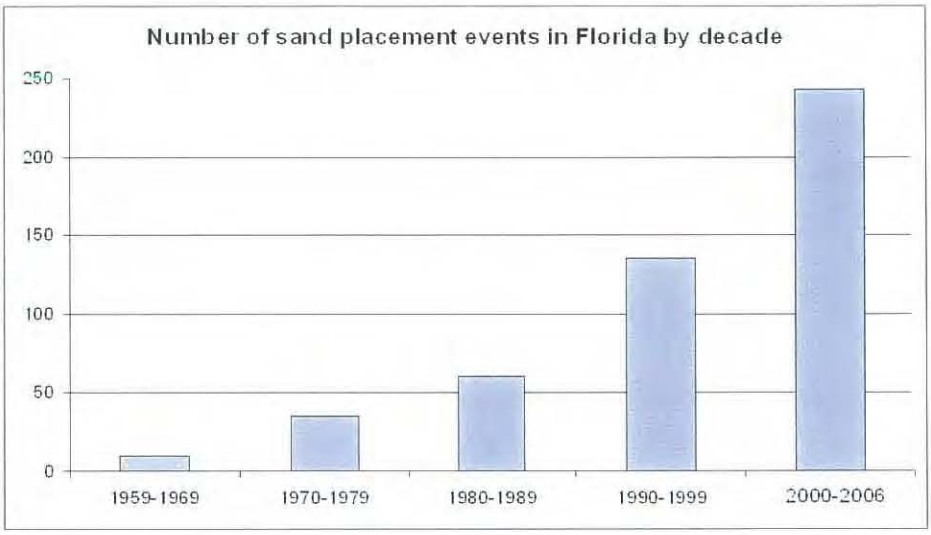

Figure 3. Number of sand placement events in Florida between 1959 and 2006.

DeMarco, Paul M SAJ

To: Mark Sramek
Subject: RE: 2012 Fort Myers Beach Harbor Maintenance Dredging EFH Conservation Recommendations (UNCLASSIFIED)

From: Mark Sramek [mailto:mark.sramek@noaa.gov]
Sent: Tuesday, July 17, 2012 9:55 AM
To: DeMarco, Paul M SAJ
Cc: McConnell, Kathleen K. SAJ
Subject: Re: 2012 Fort Myers Beach Harbor Maintenance Dredging EFH Conservation Recommendations (UNCLASSIFIED)

NOAA's National Marine Fisheries Service, Southeast Region, Habitat Conservation Division, has reviewed the subject Department of the Army Environmental Assessment and Finding of No Significant Impact regarding the action, listed below. Based upon our site inspection of the project area with U. S. Fish and Wildlife Service staff during January 2009, review of information provided on the U. S. Army Corps of Engineers' Planning Division website, and discussions with Planning Division staff on this date, we anticipate that any adverse effects that might occur on marine and anadromous fishery resources would be minimal and, therefore, do not object to authorization of this activity.

> -----Original Message-----
> From: DeMarco, Paul M SAJ
> Sent: Tuesday, May 08, 2012 10:16 AM
> To: McConnell, Kathleen K. SAJ; Mark Sramek
> Cc: Spinning, Jason J SAJ
> Subject: 2012 Fort Myers Beach Harbor Maintenance Dredging EFH Conservation Recommendations (UNCLASSIFIED)
> Importance: High
>
> Classification: UNCLASSIFIED
> Caveats: NONE
>
> Good morning Mark, attached please find the public notice for a new O&M environmental assessment for subject project. The link to that document is:
>
>
http://www.saj.usace.army.mil/Divisions/Planning/Branches/Environmental/DocsNotices_OnLine_LeeCo.htm
>
>
> It is the Ft. Myers Beach Harbor O&M : Maintenance Dredging with Beach and Nearshore Placement : Draft EA/FONSI. A hardcopy of the attached notice should have been mailed to your organization last month as well.
>
> Please consider this email a request for initiation of EFH consultation. Our assessment is incorporated into the draft EA at the above link. We look forward to receiving your EFH conservation recommendations for this routine maintenance dredging project with beneficial use of the dredged material.
>
> Please let me know if I can clarify anything or provide any additional information.
>
> Paul DeMarco
> Biologist
> Corps of Engineers - SAD

> Jacksonville District
> Planning and Policy Division
> 701 San Marco Blvd - P.O. Box 4970
> Jacksonville, FL 32232
> 904-232-1897 (phone)
> 904-232-3442 (fax)
> Paul.M.DeMarco@usace.army.mil
>
> Classification: UNCLASSIFIED
> Caveats: NONE

FLORIDA DEPARTMENT of STATE

RICK SCOTT
Governor

KEN DETZNER
Secretary of State

Mr. Eric Summa
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

March 9, 2012

Re: DHR Project File No.: 2012-00580 (2011-05347) / 1A-32 Permit No.: 1012.007
Received by DHR: February 3, 2012
Draft Report: *Cultural Resources Remote Sensing Survey of the Ft. Myers Maintenance Dredging Project, Lee County, Florida*

Dear Mr. Summa:

Our office received and reviewed the above referenced draft survey report in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*, and Chapter 267, *Florida Statutes*, for assessment of possible adverse impact to cultural resources (any prehistoric or historic district, site, building, structure, or object) listed, or eligible for listing, in the National Register of Historic Places (NRHP).

Between August and September 2011, Panamerican Consultants, Inc. (PCI) conducted an underwater remote sensing survey of a navigation channel proposed for maintenance dredging, an associated pipeline route, and a near shore dredge material disposal site. The survey was completed on behalf of the US Army Corps of Engineers, Jacksonville District. PCI identified sixty-seven (67) magnetic anomalies, twelve (12) sidescan sonar contacts, and sixty-seven (67) subbottom features within the surveyed areas during the investigation.

PCI recommends avoidance of six potentially significant magnetic anomalies (M-06, M-07, M-08, M-09, M-11, and M-13), including a protective buffer.

The Corps will avoid all six potentially significant anomalies and establish a minimum 100 foot buffer around each, wherein no anchoring, spudding, or direct outfall will be permitted. Sand disposal within the near shore area will have no adverse effect on the potentially significant anomalies.

Based on the information provided, our office concurs with these determinations and finds the draft report complete and sufficient in accordance with Chapter 1A-46, *Florida Administrative Code.*

For any questions concerning our comments, please contact Rudy Westerman, Historic Preservationist, by electronic mail at rjwesterman@dos.state.fl.us, or by phone at 850.245.6333. We appreciate your continued interest in protecting Florida's historic properties.

Sincerely,

Laura A. Kammerer

Laura A. Kammerer
Deputy State Historic Preservation Officer
For Review and Compliance

Pc: Panamerican Consultants, Inc.
Mary Glowacki, MS 8B

SEMINOLE TRIBE OF FLORIDA
TRIBAL HISTORIC PRESERVATION OFFICE

TRIBAL HISTORIC
PRESERVATION OFFICE

SEMINOLE TRIBE OF FLORIDA
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FAX: (863) 902-1117

Paul DeMarco
Department of the Army
Jacksonville District Corps of Engineers
P.O. Box 4970
Jacksonville, Florida 32232-0019

THPO#: 009798

April 20, 2012

Subject: Assessment of Effects for the Proposed Maintenance Dredging of the Fort Myers Beach Harbor Federal Navigation Project, Lee County, Florida

Dear Mr. DeMarco,

The Seminole Tribe of Florida's Tribal Historic Preservation Office (STOF-THPO) has received the Jacksonville Corps of Engineers correspondence regarding the above mentioned project. The STOF-THPO has no objection to your proposal at this time. However, the STOF-THPO would like to be informed if cultural resources that are potentially ancestral or historically relevant to the Seminole Tribe of Florida are inadvertently discovered during the construction process.

We thank you for the opportunity to review the information that has been sent to date regarding this project. Please reference *THPO-009798* in any future documentation about this project.

Sincerely,

Direct routine inquiries to:

Paul N. Backhouse, Ph.D.
Acting Tribal Historic Preservation Officer
Seminole Tribe of Florida

Anne Mullins
Compliance Review Supervisor
annemullins@semtribe.com

AES:am:pb