

**DRAFT
ENVIRONMENTAL ASSESSMENT
AND
SECTION 404(b)(1) EVALUATION
FOR**

**BEACH EROSION CONTROL AND
STORM DAMAGE REDUCTION PROJECT
PANAMA CITY BEACH, BAY COUNTY, FLORIDA
CARILLON BEACH AND PINNACLE PORT EXTENSION**

Prepared by
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Planning and Environmental Division
Environmental Resources Branch
Coastal Environment Team



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DRAFT

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1.0 INTRODUCTION

1.1 Location. The Panama City Beaches Storm Damage Reduction Project (SDR) is located in the northwest Florida Panhandle and extends 18.6 miles from Phillips Inlet eastward to the Panama City Harbor (St. Andrews Bay) entrance channel shown in Figure 1. The project site is located 80 miles southwest of Tallahassee. The Federal project area is made up of shorelines of Panama City Beach and unincorporated shorelines of Bay County, in addition to several borrow areas located offshore in the Gulf of Mexico.



Figure 1: Panama City Beach Vicinity Map (CP&E , 2007)

1.2 Purpose and Need. The purpose of the proposed action is to provide SDR along the critically eroded shoreline of Carillon Beach and Pinnacle Port (C-PP). The entire western half of Bay County extending 18.6 miles between Phillips Inlet and St. Andrews Inlet is critically eroded, threatening development and recreational interests (FDEP, 2005). The segment of shoreline along C-PP sustained significant beach erosion following hurricanes Opal in 1995, Ivan in 2004, Dennis in 2005 and Katrina in 2005. Beach nourishment was conducted by Bay County in 1998 following Hurricane Opal, which placed 341,000 cubic yards of sand on the beach between R 1 and R 5.5 with a 1,000-foot taper to the west. The 2004 and 2005 hurricane seasons eroded most of the fill in front of C-PP beach developments and caused major damage to several condominium buildings. To help provide a temporary frontline of defense against wind and tidal energies associated with up to a 5-year storm event a Federal Emergency Management

Agency berm was built in 2006. The 16.8 miles immediately east of proposed action was partially restored following the impacts of Hurricane Ivan. As a result this area sustained only minimal structural damage following during the 2005 hurricane season. Given the critically eroded shoreline along C-PP, the area is susceptible to potential damage from storm events.

1.3 Authority. The Panama City Beaches SDR project was originally authorized by Section 501 of the Water Resources Development Act (WRDA) 1986 (Pubic Law 99-662) and reauthorized by Section 318 WRDA 1996 (Public Law 104-303).

1.4 Description of the Authorized Project. The plan authorized by WRDA 1986 provided for a dune top width of 30-foot at an elevation of 15-foot National Geodetic Vertical Datum (NGVD), a 25-foot wide storm berm at 7-foot-NGVD, and a 10-foot wide berm at 4-foot-NGVD sloping down to the natural bottom of the Gulf of Mexico at 1V: 18 H. The plan also authorized stabilization of the dune top with vegetation. The project was modified in 1996 based on a storm protection benefit analysis according to the National Economic Development (NED) standard. The modified plan adjusted the fill template and included construction of a terminal groin near Philips Inlet. The locally preferred alternative, which terminated the project eastward of Philips Inlet with no terminal groin structure, was implemented under recommendations of the 1996 General Reevaluation Report (GRR). The locally preferred alternative provides for a 7-foot berm landward of the erosion control line with a 50-foot top width from Florida Department of Environmental Protection (FDEP) monument R-91.5 to R-17.5, transitioning to a 30-foot top width at R-16 and continuing with a 30-foot top width to R-5.0 with appropriate transitions to tie back into the natural shoreline at the ends of the project (Figure 2).

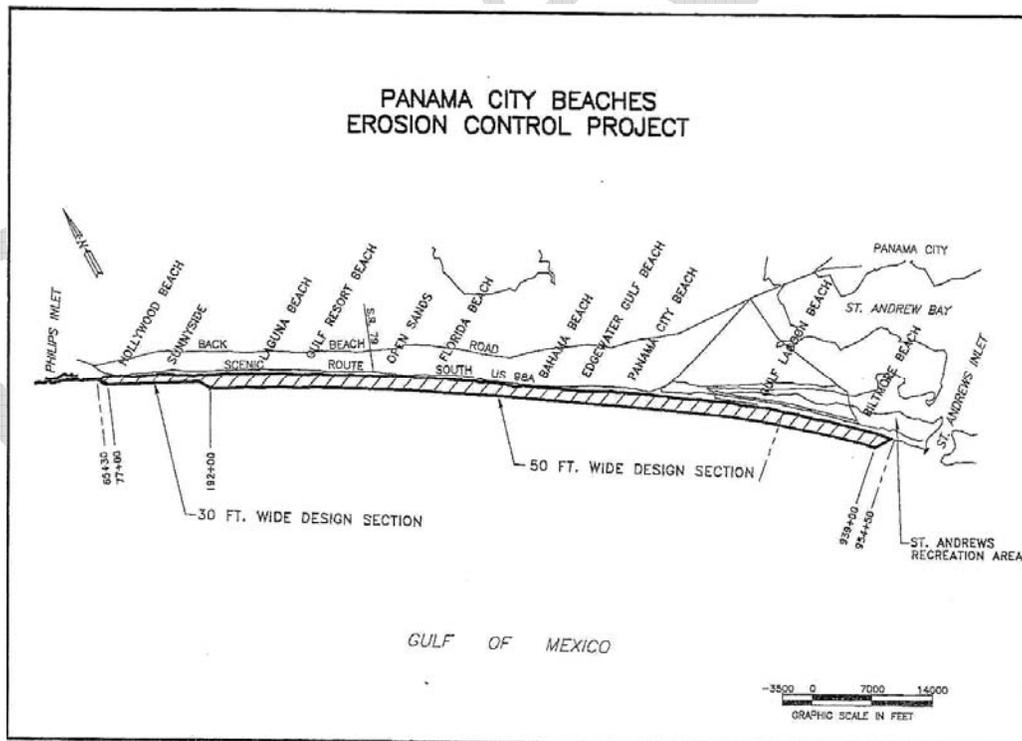


Figure 2: Panama City Beach Placement

1.5 Environmental History and Scope. An Environmental Impact Statement (EIS) entitled, Beach Erosion Control and Hurricane Protection, Panama City Beaches, Florida was completed in February 1979. The EIS resulted in authorization in the WRDA 1986 (PL 99-662), which was approved on 17 November 1986. The plan, which was authorized by WRDA 1986, provides for 18.5 miles of beach restoration along Panama City Beach, Bay County, Florida. An Environmental Assessment (EA) entitled, Beach Erosion Control and Storm Damage Reduction Project, Panama City Beach, Bay County, Florida was completed in 1995. This EA updated the resource description and impacts associated with the locally preferred alternative of 16.8 miles of beach restoration along Panama City Beach, Bay County, Florida. An EA entitled, Beach Erosion Control and Storm Damage Reduction Project, Panama City Beach, Bay County, Florida was completed in 1997. This EA evaluated impacts associated with changes in the project configuration, which were implemented by the local sponsor, the Bay County Tourist Development Council (TDC), during the 1998 beach nourishment. A draft EA entitled, Beach Erosion Control and Storm Damage Reduction Project, Panama City Beach, Bay County, Florida was completed in 2007. This draft EA was prepared to address the potential impacts associated with the use of an additional sand source and to update the resource description and impacts associated with beach restoration along 16.8 miles of the Panama City, Bay County beaches.

The scope of this EA is to address the potential impacts associated with implementation of Federal beach restoration along an approximate mile reach immediately west of the federally nourished Panama City Beaches SDR project. The previous EIS and EAs are hereby incorporated into this document by reference.

2.0 ALTERNATIVES

2.1 No Action Alternative. A no-action alternative would not provide immediate protection to areas along C-PP beaches where the shoreline is critically eroded. The no-action alternative would allow continuation of existing erosion and decreasing beach widths. Damage to existing structures, would continue to occur. Loss of valuable property would likely occur causing a decline in local resident use and tourism. Environmental impacts (shorebird and sea turtle nesting habitat) due to erosion and transport of sands would also continue to occur.

2.2 Non-Structural (Beach restoration). Beach restoration would consist of constructing a berm, approximately 130-foot wide at an elevation of 7-foot NGVD, a 1V:10H slope from the berm's seaward edge to 0 NGVD, and a 1V:15H slope to the toe of the fill (intersection with the existing bottom), between R-1 and R-4.5. The project would tie into the existing nourished beach to the east and would include an approximate 1,000-foot taper to tie into the existing beach to the west (R-0.5 to R-5.5). Because the seaward slope of the construction profile is steeper than the native slope, the construction profile is expected to adjust rapidly through the erosion of the berm with deposition near the toe of the fill until its shape; termed equilibrium profile mimics the natural nearshore profile shape. The construction and equilibrium beach profiles would contain identical volumes of sand; the volume eroded from the berm during adjustment process would equal the volume deposited at the toe of the fill. The protective berm design width is 30-foot.

2.2.1 Sand Sources.

Offshore Sources. Extensive geotechnical investigations for beach compatible sand within the vicinity of the project have been conducted over several years. Geotechnical investigations were performed in 1984, 1990, and 1994 for the Panama City Beach SDR Project in conjunction with the Panama City Harbor Navigation Improvement Project. This sand search resulted in the identification of 6 borrow areas. Additional geotechnical data, obtained in 1997 by Coastal Planning and Engineering, Inc. (CP&E), expanded the original 6 borrow areas to a total of 9 sand source areas (Figure 3). Geotechnical investigations were performed by CP&E in 2005 and a new borrow area (BA 11) was identified to help restore losses to Panama City Beaches following impacts from Hurricane Dennis and Katrina (Figure 3). Table 1 below list the quantity of beach quality sand remaining in the existing borrow areas.

Table 1: Estimated Remaining Borrow Area Volumes

Area	Estimated Borrow Vol. remaining, cy	Estimated Borrow Avg. Depth remaining, ft
BA-IX	63,000	2.0
BA-VII	154,000	2.8
BA-III	152,000	2.5
BA-I	463,000	1.6
BA-5C	508,000	5.7
BA-11	564,000	8.0
BA-10	*94,000	N/A

*Estimate based on channel shoaling rates

Excavating material from BA-IX, VII, III, and I at this time; would be inefficient given the small quantities, shallow depth of the available material, and/or large variations in both the ground surface and excavation limits. Therefore, material for initial restoration would come from either BA 5C, BA 11 and/or the navigation channel (BA 10). A reconnaissance level search to identify an adequate volume of material for beach re-nourishment for the Panama City Beach SDR project over the next 15 years is currently being conducted. This is a long term study that is not at a level to provide additional sand sources to address the immediate need for restoring the beach, but will likely be evaluated in the future as a potential sand source for renourishment.

Upland Sources. Given the quantity of beach quality material needed and the high costs associated with upland sources this alternative was considered, but not evaluated in detail.

2.2.2 Dredging Equipment. The U.S. Army Corps of Engineers (Corps) does not normally specify the type of dredging equipment to be used. This is generally left to 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 excavation, the depth of access to the placement site, the amount of material, the distance to the 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>.

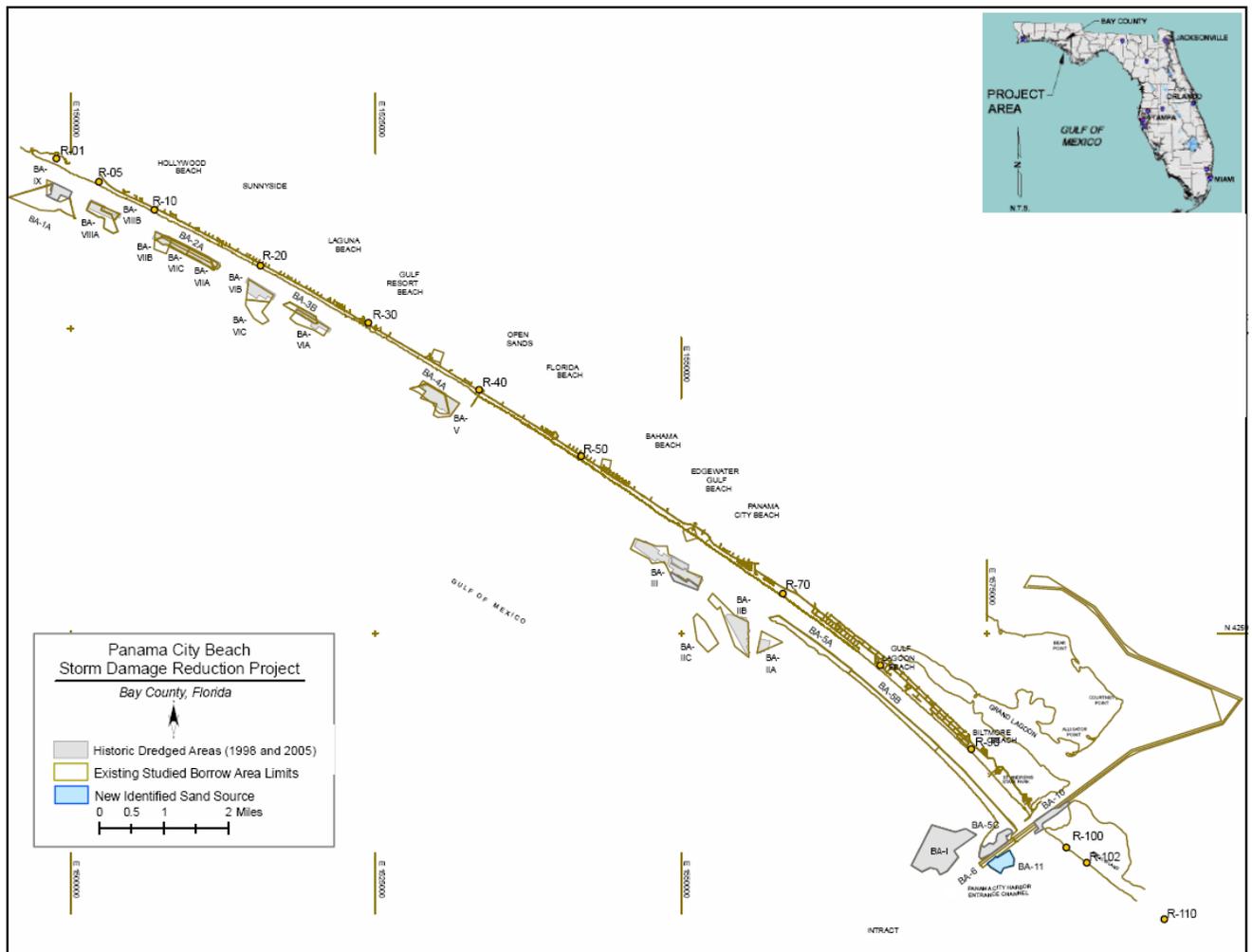


Figure 3: Panama City Beach Identified Sand Source Areas

2.3 Structural Alternatives. Structural alternatives were considered during the original authorization. The preferred alternative was for beach restoration, therefore; further evaluations of structural alternatives were not considered in this assessment.

2.4 Preferred Alternative. The preferred alternative is to extend beach nourishment from the western end of the existing nourished Panama City Beach SDR project at R-4.5 to R-01, a distance of approximately 1 mile (Figure 4). The project would tie into the existing nourished beach to the east and would include an approximate 1,000-foot taper to transition into the existing beach to the west (R 0.5 to R-5.5). The construction berm, which includes overfill for loss of fines grains during initial placement and advance maintenance, would consist of an approximately 130-foot wide berm at an elevation of 7-foot NGVD, a 1V:10H slope from the berm's seaward edge to 0 NGVD, and a 1V:15H slope to the toe of the fill (intersection with the existing bottom). Because the seaward slope of the construction profile would be steeper than the native slope, the construction profile is expected to adjust rapidly through the erosion of the berm with deposition near the toe of the fill until its shape; termed equilibrium profile mimics the natural nearshore profile shape. The construction and equilibrium beach profiles would contain

identical volumes of sand; the volume eroded from the berm during adjustment process would equal the volume deposited at the toe of the fill. The protective berm design width is 30-foot.

In total, the initial beach restoration along C-PP developments (R 0.5 to R 5.5 including tapers) would consist of placing approximately 390,000 cubic yards sand along an approximate mile long stretch of shoreline. Beach quality sand for beach nourishment would be excavated from existing identified offshore borrows areas via a hydraulic cutter head and/or hopper dredge. The sand would be pumped to the beach through a submerged pipeline, and graded with land-based equipment to the construction template configuration. Periodic beach re-nourishments are expected to occur on average once every 10 years. A reconnaissance level search to identify an adequate volume of material for beach re-nourishment for the Panama City Beach SDR project over the next 15 years is currently being conducted. This is a long-term study and is not at a level to provide additional sand sources to address the immediate need for restoring the beach, but will likely be considered in the future as a potential sand source.

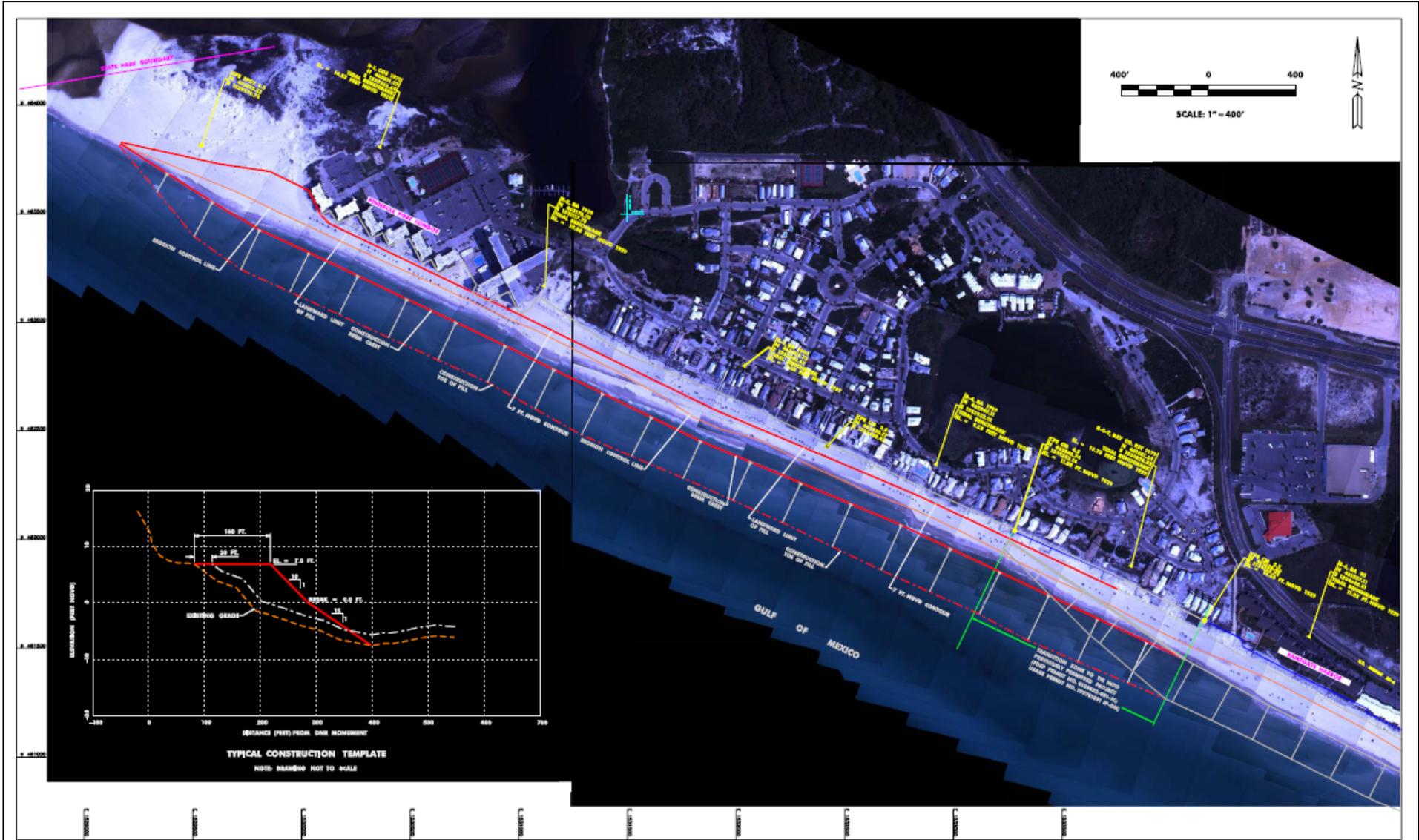


Figure 4: Panama City Beach SDR Project Carillon and Pinnacle Port Extension

3.0 AFFECTED ENVIRONMENT.

3.1 Coastal Processes. Wave energy is considered to be moderate (Price, 1954; Tanner 1960) with a mean wave height of 2.6 feet. The most predominant waves in the Gulf of Mexico are wind generated waves. The prevailing winds are from the southeast and south, which generate an east to west longshore current (Culter and Mahadevan, 1982), with the exception of a localized area of reversed sediment transport just west of St. Andrews Inlet (Coastal Technology, 2002; Corps, 1994). The net sediment transport rates based a wave analysis by the Corps (1994) range from 66,000 to 91,000 cy/year (Corps, 1996). A more recent sediment budget from Coastal Technology (2002) is provided in Figure 5. An analysis of historic shoreline change rate conducted by CP&E from R1 to R6 for the time period between 1997 and 1999 showed an average rate of shoreline change of approximately -6 ft/year.

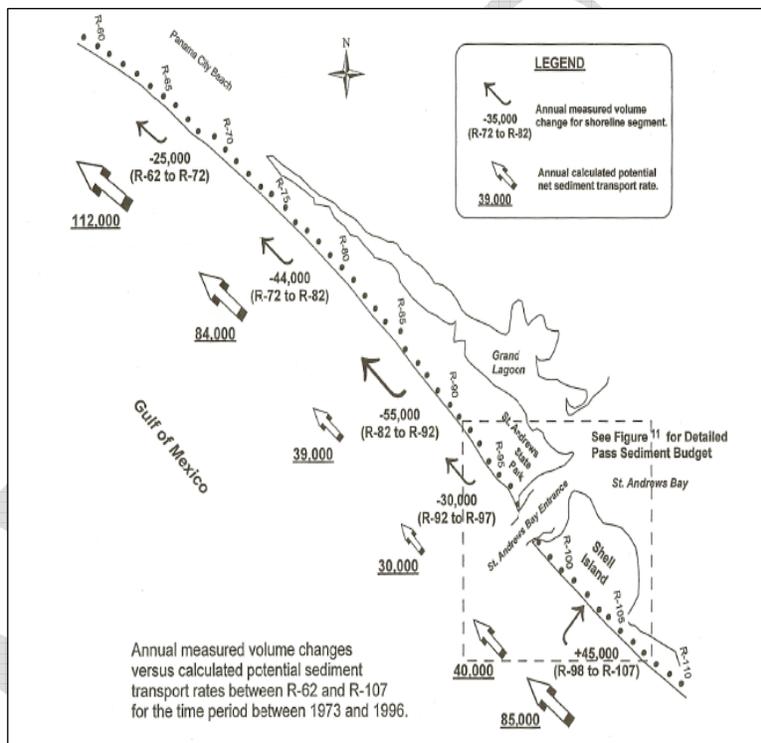


Figure 5: Panama City Beach Sediment Budget (Coastal Technology, 2002)

Two inlets are located within the vicinity of the project, St. Andrews Inlet on the east and Philips Inlet on the west. St. Andrews Inlet was opened in 1934 and has been maintained by the Corps for safe navigational passage between St. Andrews bay and the Gulf of Mexico. Maintenance dredging of the Panama City Harbor Entrance Channel is conducted on an average of once every 2 years. Material removed from the entrance channel (~ 94,000 cubic yards/year) is bypassed to the downdrift beaches. Philips Inlet is an intermittent pass between Powell Lake and the Gulf of Mexico. The inlet periodically migrates within a 0.5 mile stretch west of the Pinnacle Port condominiums. The historic pattern has been that the inlet would migrate to the west, close off, and then re-open at a more hydraulically efficient location usually to the east, when the runoff into Lake Powell builds sufficient head, or when wave action associated with a large storm causes a break-through. In recent years the inlet has been mechanically opened by the county to lower water levels that build up from runoff into Lake Powell.

3.2 Fish and Wildlife Resources.

3.2.1 Coastal sand dune/beach. Most of the natural terrestrial communities in the project area have been affected by development. The areas seaward of the structures are typically described as unvegetated beachface. The beaches adjacent to the action area along the State parks and Sunnyside contain natural terrestrial communities that are more representative of pre-development conditions. Typical habitats in these areas include primary dune systems with low elevation foredunes. Lower elevation dunes are vegetated primarily with sea oats. Other vegetation includes panic grass, morning glory, rail road vine, sand spur, and other grasses and sedges. Higher dune habitats contain additional species, such as scrub oak, briars, cabbage palm, saw palmetto, rosemary, salt rush, and groundsel tree. Examples of wildlife using the beach and dune habitats include sea turtles, shorebirds, crustaceans, such as ghost crabs, reptiles, and various predators such as raccoons and snakes. The beaches along the project are important wintering areas for shorebirds such as sanderling, dunlin, short-billed dowitchers, plovers and willet. The beaches and dunes are also important nesting sites for birds including terns, black skimmer and plovers.

3.2.2 Intertidal/Swash and Nearshore Marine. The nearshore zone within the limits of beach placement and the borrow areas consists of sandy substrate. Submerged aquatic vegetation occurs within the St. Andrews inlet pass and St. Andrews Bay. No seagrasses are located within the proposed beach restoration or the existing borrow areas.

The sandy substrate of intertidal swash zone provides habitat for benthic and infaunal communities characterized by low species diversity. Saloman and Naughton (1978) investigated benthic macroinvertebrate assemblages inhabiting the swash zone at Panama City Beach, Florida. Sampling data showed four dominant species representing four families: *Donax texasianus*, a borrowing bivalve; *Scolelepis squamata*, a polychaete worm; *Haustorius sp.*, an amphipod; and *Emerita talpoida*, an anomuran crab.

Saloman (1976) investigated benthic faunal populations inhabiting the nearshore zone off Panama City Beach, Florida. According to Saloman, a variety of crabs, marine worms, clams, cumacans, and sandhoppers dominate the nearshore zone. *Donax Texasianus*, a burrowing bivalve, commonly occurred on both sandbars and troughs. Other dominant species found on the first offshore bar include *Haustorius sp.*, an amphipod; *Mancocuma sp.*, a cumaces; and *Scolelepis squamata*, a polychaete worm. Additional dominant species found on the second sandbar and adjacent landward trough includes the *haustoriid*, *Acanthohaustorius n. sp.*, *Protohaustorius n. sp.*, and *Pseudohaustorius n. sp.* Saloman's research also showed significant populations of two polychaete worms – *Dispio uncinata* occupying the second offshore sandbar and *Spio pettiboneae* occupying the deeper troughs.

3.3 Threatened and Endangered Species. The surrounding area is known to support the Gulf sturgeon, Piping plover, Florida manatee and various species of marine turtles.

Gulf sturgeon spend cool months (October or November through March or April) in estuarine areas, bays, or in the Gulf of Mexico. Research indicates that in the estuary/marine environment both subadult and adult Gulf sturgeon show preference for sand shoreline habitats with water

depths less than 3.5 m and salinity less than 6.3 parts per thousand (ppt). The majority of tagged fish have been located in areas lacking seagrass, in shallow shoals 1.5 to 2.1 meter (4.9 to 6.8 feet) and deep holes near passes, and in unvegetated, fine to medium-grained habitats, such as sandbars, and intertidal and subtidal energy zones. These shifting predominately sandy, areas support a variety of potential prey items including estuarine crustaceans, small bivalve mollusks, ghost shrimp, small crabs and various polychaete worms and lancelets. The nearshore environment offshore of Panama City Beach is designated as Gulf Sturgeon critical habitat. Data collected from several years of research suggest that the fish near the project area are usually found at known over wintering areas to the east of the St. Andrews inlet along Tyndall and Mexico Beaches (Frank Paruaka, personal communication 2006). Gulf sturgeon from the Brothers, Yellow, Apalachicola and Choctawhatchee rivers have been located off Tyndall and/or Mexico beaches in water depths typically of 12-20 feet (F. Paruaka, personal communication 2006). In addition, a number of reports from anglers fishing off Panama City Beach piers, indicate that Gulf sturgeon are swimming along the Gulf coast in the project area (USFWS, 2006).

Piping plover winter in coastal areas of the United States from North Carolina to Texas. Their wintering season generally extends from August through May. The species can be found feeding on exposed wet sand in swash zones; intertidal ocean beach; wrack lines; washover passes; mud-, sand-, and algal flats; and shorelines of streams, ephemeral ponds, lagoons, and salt marshes (Coutu *et al.*, 1990). They also use beaches adjacent to foraging areas for roosting and preening and small sand dunes, debris, and sparse vegetation within adjacent beaches for shelter from wind and extreme temperatures. Shell Island located east of the St. Andrews Inlet is designated as piping plover critical habitat. Although the species is known to utilize the surrounding state parks they are less likely to utilize the project area due to the high level of human disturbance. No piping plovers were identified during the 2005 or 2006 shorebird surveys conducted within the limits of the project.

The Florida manatee occur in both fresh and salt water habitats within tropical and subtropical regions and show preferences to waters with salinity levels of less than 25 ppt (Hartman, 1979). Several factors contribute to the distribution of manatees in Florida. These factors are habitat-related and include proximity to warm water during cold weather, aquatic vegetation availability, proximity to channels of at least 6.5 feet in depth, and location of fresh water sources (Hartman, 1979). Manatees often seek out quiet areas in canals, creeks, lagoons or rivers. Deeper channels are often used as migratory routes. The U.S. manatee population generally confines itself to the coastal waters of the southern half of peninsular Florida and to springs and warm water industrial outfalls as far north as southeast Georgia.

Of the five federally-listed species of threatened and endangered sea turtles the Kemp's ridleys and loggerheads are the most likely species to occur in the project area due to fact that they are generalist carnivores which typically prey on benthic mollusks and crustaceans in the nearshore environment. Both species can be found foraging in shallow sand-mud habitat and at high-relief rock or reef habitats (NMFS, 2005). Hawksbill and green turtles are specialist feeders that target sponges and seagrass or macroalgae making them less likely to occur in the area of excavation and sand placement. Leatherbacks are pelagic feeds and as such are the most oceanic of all the

sea turtles, preferring deeper waters (Rebel, 1974). The species is known to occasionally enter shallow waters and estuaries in the more northern areas of its range (Ernst and Barbour, 1972).

In addition to the aquatic environment, the beaches of the Florida panhandle provide nesting grounds for federally-listed marine turtles. The marine turtle nesting season in this area spans from May 1 through October 31. The threatened loggerhead turtle frequently nest, although at relative low densities, on the beaches along the SDR project. Although green turtle nesting has been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia Counties) and from Pinellas County through Collier County, only false crawls have been documented on Bay County Beaches. The endangered leatherback, Kemp's ridley and hawksbill sea turtles may occasionally nest on northwest Florida's beaches; however, recent nesting has not been reported in Bay County, Florida. Loggerhead sea turtles' nest incubation within the limits of the SDR project averages 65 days with peak nesting in mid June and peak hatching in late August (Watson, 2005). Documented average number of nest for the project area over the past 15 years (1991-2005) is 21.7 nests per year. The nesting density is approximately one nest per mile of beach (Watson, 1991, 1993, 1994).

3.4 Essential Fish Habitat. Congress defines Essential Fish Habitat (EFH) as “those waters and substrates necessary to fish for spawning, breeding, feeding or growth to maturity,” the designation and conservation of EFH seeks to minimize adverse effects on habitat caused by fishing and non-fishing activities. The National Marine Fisheries Service (NMFS) has identified EFH habitats for the Gulf of Mexico in its Fishery Management Plan Amendments. These habitats include estuarine areas, such as estuarine emergent wetlands, seagrass beds, algal flats, mud, sand, shell, and rock substrates. In addition, marine areas, such as the water column, vegetated and non-vegetated bottoms, artificial and coral reefs, geologic features and continental shelf features have also been identified. The habitat in the project area, which is located within the Gulf of Mexico, consists of estuarine waters and unvegetated bottoms with sand substrates. Of the species managed by the Gulf Coast Fishery Management, the following would be expected to utilize the project area: brown shrimp *Penaeus aztecus*, pink shrimp *P. duorarum*, white shrimp *P. setiferus*, king mackerel *Scomberomorus cavalla*, Spanish mackerel *S. maculate*, gray snapper *Lutjanus griseus*, lane snapper *L. synagris*, gag grouper *Mycteroperca microlepis*, and red drum *Sciaenops ocellatus*.

Epibentic crustaceans and infaunal polychaetes dominate the diets of higher trophic levels, such as flounder, catfish, croaker, porgy, and drum. The fish species composition of the estuarine and offshore area along the northern Gulf of Mexico is of high diversity due to the variety of environmental conditions, which exist within the area.

3.5 Special Aquatic Sites. The St. Andrews State Park Aquatic Preserve surrounds the entrance of St. Andrew Bay and includes West and East Pass, Shell Island, and portions of the St. Andrew State Recreation Area (FDEP, 2007). Designation of an area as an Aquatic Preserve under Florida's Aquatic Preserve Act is to ensure that the preserves' natural condition (aesthetic, biological, and scientific values) is conserved for the enjoyment of future generations. Borrow areas 5C, 1, 11 and the navigation channel lie partly within the St. Andrews State Park Aquatic Preserve.

3.6 Water Quality. The FDEP classifies the coastal water in the project area as Class III, defined as waters suitable for recreation and propagation of fish and wildlife. The waters within the St. Andrew State Park Aquatic Preserve and Lake Powell are classified as an “Outstanding Florida Water” (OFW), which is assigned additional protection through the FDEP Regulation. The FDEP sets water quality standards and requires monitoring of water quality during sand excavation and beach placement operations.

3.7 Sediment Quality. Several native beach samples were taken in the dry beach along and cross-shore of Panama City beaches as well as in the submerged active profile in 1997. Composite beach sediment characteristics at the time included a mean grain size of 0.24 mm (fine sand) with a 0.53 sorting (moderately well sorted) and 0.94% silt. Composite characteristics of beach sediments collected in 2004 indicate a mean grain size of 0.28 millimeters (mm) (fine sand), 0.58 phi sorting (moderately well sorted) and 0.68% silt. Existing BA contains sediments that are very similar to the existing beach sands. The composite borrow area grain sizes range from around 0.25 to 0.37 mm. Both borrow area and beach sediments are moderately well sorted and silt percentage is less than 1%. Dry Munsell color values of beach sediments are generally 8 with a few isolated areas with slightly darker sediments. The average dry Munsell color of the borrow areas material is greater than 7.

3.8 Hazardous, Toxic, and Radio Active Waste. The project area lies primarily in residential and recreational areas. The Corps knows of no sources of hazardous, toxic and radioactive waste (HTRW) in the project area.

3.9 Air Quality. Non-point sources such as vehicular traffic exists within the area; however, air quality along Panama City beaches is good due to the presence of either on or offshore breezes that readily disperse airborne pollutants. Bay County is classified as an attainment area for all Federal Air Quality Standards.

3.10 Noise. Ambient noise levels in the project area are low to moderate. Because of the urbanization near the beaches and the popularity of the beach environment, elevated noise levels primarily from vehicles, may occur during weekends and summer months. The major noise producing source of the area year round is breaking surf adjacent to residential and resort areas.

3.11 Aesthetics. The signature white sandy beaches and the relatively low wave energy of the Gulf of Mexico provide a visually-pleasing environment along the beaches of Bay County.

3.12 Recreation. Locals and tourist spend much time sunbathing, sailing, fishing, walking and engaging in other active and passive activities near the beach. Beach usage peaks during the summer and subsides during the winter.

3.13 Navigation. The existing deep draft channel into Panama City Harbor was authorized under the Rivers and Harbors Act of 1948 (House Document 559, 80th Congress). The navigation project provides for a channel about 2.6 miles long extending from deep water in St. Andrew Bay across the Land East Peninsula to the Gulf of Mexico. The channel is protected by two jetties, each about 700 feet long. Within St. Andrew Bay natural water depths allow vessels to safely navigate to Dyers Point and Bay Harbor terminals.

3.14 Historic and Cultural Resources. A search of the Florida Master Site File for the project area revealed no known archaeological or historic properties within the proposed area of potential effect, although numerous sites are recorded to the north surrounding Lake Powell.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

4.1 Coastal Processes. Coastal processes at Philips Inlet were analyzed by CP&E in 2007 to determine if the downdrift contribution of sands along C-PP beaches would adversely affect the mechanical or natural opening of the inlet. This analysis used aerial photographs, topographic survey, profile data, and volumetric and shoreline change tables and figures. The period of analysis was between 1988 and 2006, a period which included many natural and mechanical inlet opening events, a nourishment project at Carillon Beach-Pinnacle Port developments in 1999, and hurricanes in 1995, 2004 and 2005. The analysis showed that the sand volume placed in 1999 made a small downdrift contribution to the sand volumes, but did not result in an increase or decrease in the mechanical or natural opening. The downdrift impact of the 1998 C-PP nourishment moderated the natural erosion trend, but did not permanently increase the height or width of the region, which controls the release of floods from Powell Lake (CP&E, 2007). Since 1996, there is no indication that a higher dune or berm had formed in the vicinity of Philips Inlet that could act as a higher natural dam (CP&E, 2007). Nourishment of CC-P beaches is expected to make a small downdrift contribution to the sand volumes, which will moderate the natural erosion trend, but will not permanently increase the height or width of this region.

4.2 Fish and Wildlife Resources.

4.2.1 Coastal sand dune/beach. The proposed work would create disturbance to fauna species; such as crabs and shorebirds utilizing the terrestrial habitats within the project limits. This would mainly involve short-term disturbance from equipment, vehicles and personnel movements for the duration of work. However, these species are mobile and would generally avoid the site during construction. Some loss of beach flora may occur during nourishment; however this is expected to be minimal.

Based on previous coordination with the State and FWS, a number of conservation measures associated with the protection of shorebirds have been incorporated into the project. These include: shorebird and shorebird nesting surveys for construction work conducted between February and September and buffer zones around identified shorebird courtship or nesting behavior within the project area.

4.2.2 Intertidal/Swash and Nearshore Marine. Excavation and beach placement would result in significant mortality of non-motile benthic organisms. However, these organisms typically adapt well to the dynamic coastal environment. With their high fecundity and recruitment potential, they should repopulate the affected areas in a relative short time. Several past studies have shown no significant long-term effects on benthic communities from beach restoration. Saloman and Naughton (1984) studied the effect of beach restoration with offshore excavated sand on the nearshore macroinfauna at Panama City Beach, Florida. They concluded that restoration had minor, short-term effects on benthic macroinvertebrates, noting that populations appeared to stabilize within five to six weeks after restoration. As noted in previous studies,

intertidal benthic assemblages declined in abundance and diversity immediately following restoration, but recovered within several weeks.

4.3 Threatened and Endangered Species. Pursuant to Section 7 of the Endangered Species Act, the proposed action has been coordinated with the U.S. Department of the Interior, Fish and Wildlife Service (USFWS), and the U.S. Department of Commerce, National Marine Fisheries Service (NMFS) to address potential affects of the proposed action on listed threatened and endangered species and their critical habitats.

Excavation would likely be conducted using either hydraulic cutterhead pipeline or hopper dredging equipment. Existing Biological Opinions (BO) on hopper dredging in the U.S. South Atlantic and Gulf of Mexico waters (most recently, January 9, 2007, Gulf Regional Biological Opinion (GRBO) to the Corps' four Gulf of Mexico districts) have established that non-hopper type dredging methods have discountable effects on, or are not likely to adversely affect, currently listed sea turtles or Gulf sturgeon (I/SER/2006/02953; I/SER/2006/01096). Should hopper dredging equipment be utilized the Terms and Conditions set forth in the GRBO would be implemented.

Portions of the project's beach placement and borrow areas are located within critical habitat of the Gulf sturgeon. On December 29, 2004, NMFS issued a BO stating that the removal of sand from approximately 316 acres of nearshore borrow areas for the restoration of 16.8 miles of beach would not adversely modify Gulf sturgeon critical habitat. Formal consultation to address possible impacts to the Gulf sturgeon and its associated critical habitat as a result of the excavation of a new borrow area (BA 11) and inclusion of C-PP developments was initiated with NMFS, August 2006. NMFS determined in their August 16, 2007 BO that the action, as proposed, would not destroy or adversely modify designated Gulf sturgeon critical habitat (Enclosure 1).

The USFWS issued a BO for the Panama City Beach Nourishment on April 8, 1998. In this opinion, the USFWS determined that the Panama City Beach Nourishment project would not likely jeopardize the continued existence of the loggerhead, green and leatherback turtles provided the Terms and Conditions set forth in the opinion were implemented. Formal consultation to address possible impacts to nesting sea turtles as a result of the excavation of a new borrow area (BA 11) for restoration of the Panama City Beach SDR project and inclusion of C-PP developments was initiated with the USFWS, April 2007. The USFWS issued and amended their BO determining that the proposed action would not likely jeopardize the continued existence of the loggerhead, green and leatherback turtles provided the Terms and Conditions set forth in their October 25, 2007 opinion were implemented (Enclosure 1). The Corps is currently working with the non-Federal Sponsor (Bay County TDC) and the USFWS to address lighting along the Panama City Beach SDR project in an effort to minimize the impacts of the existing Incidental Take of threatened and endangered sea turtles. Based on personnel communications with the USFWS, areas falling under the existing Bay County pilot lighting ordinance, including those areas along C-PP beaches reasonably reduce potential lighting impacts to a level that would allow for continued beach restoration.

Based on previous coordination with the State and Fish and Wildlife Service, a number of conservation measures associated with the protection of Manatee and Piping plovers have been incorporated into the project. These include: the use of Standard Manatee Protection Conditions, surveys for Piping plovers for construction during February and April, and the designation of buffer zones around areas where piping plovers occur.

During construction the Mobile District would continue to abide by the terms and conditions of the following: (1) GRBO for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts, dated November 19, 2003, as amended; (2) the USFWS's Panama City Beach Nourishment BO, dated April 8, 1998, as amended; (3) the NMFS's Panama City Beaches Renourishment BO, dated February 11, 2005, as amended.

4.4 Essential Fish Habitat. Brown shrimp (*Penaeus aztecus*), pink shrimp (*P. duorarum*), white shrimp (*P. setiferus*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*S. maculata*), gray snapper *Lutjanus griseus*, lane snapper *L. synagris*, gag grouper *Mycteroperca microlepis*, and red drum (*Sciaenops ocellatus*) are expected to occur within the vicinity of the project. No estuarine emergent wetlands, oyster reefs, or submerged aquatic vegetation would be adversely affected by the proposed action. Sand excavation and placement operations would impact benthic organisms within the footprint of the borrow areas and placement sites. However, as detailed in section 4.2 of this assessment no significant long-term impacts to this resource is expected as result of this action.

Increased water column turbidity during sand excavation and placement would be temporary and localized. The spatial extent of elevated turbidity is expected to be within 1,000 meters of the operation, with turbidity levels returning to ambient conditions within a few hours after completion of the activities. Therefore no significant long-term impacts to water quality are expected to occur.

Notwithstanding the potential harm to some individual organisms, no significant impacts to managed species of finfish or shellfish populations are anticipated from the borrow area excavation and placement operations. Therefore, it is the opinion of the Corps, Mobile District that this project would have no significant effects on Essential Fish Habitat. The public notice and the effects determination of the EA are being forwarded to the NMFS for review and comment.

4.5 Special Aquatic Sites. Designation of an area as an Aquatic Preserve under Florida's Aquatic Preserve Act is to ensure that the preserves' natural condition (aesthetic, biological, and scientific values) is conserved for the enjoyment of future generations. The project area lies partly within the St. Andrews State Park Aquatic Preserve. Effects to the aesthetics and biological condition in and near the area of excavation as a result of increased levels of turbidity and temporary loss of benthic organisms would occur. These impacts are expected to be short term in nature and would not result in significant long term impacts to the aesthetic, biological, and scientific values of the preserve.

4.6 Water quality. The discharging of effluent is expected to create some degree of construction-related turbidity in excess of the natural condition in the proximity of the placement site and the borrow areas. This turbidity is usually generated by the fines fraction of the sediments suspended within the effluent. These impacts are expected to be temporary, with suspended particles settling out within a short time without measurable effects on water quality. The State of Florida granted a mixing zone variance for the 1998 and 2005 restoration, which allowed state water quality standards to be exceeded for a limited time during excavation and placement. A similar variance is being requested for this project. During construction, turbidity levels would be monitored at the dredge and the beach sites, to ensure compliance with FDEP's Water Quality Certification.

4.7 Sediment Quality. The borrow area sediments are very similar texturally and aesthetically to the current beach sediments. Thus, no adverse impacts to morphology, sand temperature or aesthetics of the beach are anticipated from excavation and placement of borrow area sands.

4.8 Hazardous, Toxic, and Radioactive Waste. No known hazardous, toxic or radioactive waste concerns are known to exist within the confines of the project area. Nor would any be added as a result of the proposed activities. The material to be excavated are naturally occurring marine sands in areas of high current activity and far removed from sources of pollution, thus providing reasonable assurance that the material is not contaminated.

4.9 Air Quality. The proposed action would have no significant long-term affect on air quality. Air quality in the immediate vicinity of the equipment would be slightly affected for a short period of time by the fuel combustion and resulting engine exhausts. The exhaust emissions are considered insignificant in light of prevailing breezes and when compared to the existing exhaust fumes from other vessels using the project.

The project area is in attainment with the national Ambient Air Quality Standards parameters. The proposed action would not affect the attainment status of the project area or region.

4.10 Noise. Noise impacts from the construction equipment are expected to increase during excavation and placement operations in the project vicinity. These impacts would be short term and restricted to the immediate vicinity of the activity. No long-term increase in noise would occur in or around the project area.

4.11 Aesthetic. Only temporary degradation to the aesthetic environment would occur as a result of excavation and placement operations. Impacts would primarily occur as a result of the physical presence of heavy equipment on the beach. Some minor increases in turbidity may be noted in the immediate vicinity of excavation and placement activities but these increases would be minor and short term in nature. Some discoloration of the sand would occur following placement due to the fact that the sands to be placed on the beach are coming from anaerobic environment. Bleaching of the sand should occur within one to two months. Rainfall and wave action would act to filter out the fine grained materials from the restored beaches and increase the compatibility of the nourishment sands with those presently on the beach.

4.12 Recreation. For a short time, the construction process would limit the recreational activities, especially near the dredge pipe and equipment staging areas. Once completed, the

project would provide an aesthetically pleasing larger beach which would supply more area for active and passive recreational activities.

4.13 Navigation. No adverse impacts on navigation or obstruction of local riparian rights are expected to result from completion of the proposed work. Changes in wave climate and circulation within the channel due to excavation of the proposed BA 11 are expected to be minor and are not expected to have an adverse affect on navigation.

4.14 Historic and Cultural Resources. The beach area along C-PP was previously coordinated with the Florida State Historic Preservation Officer (SHPO) on two separate occasions in 1989 and 1994. In 1989, Mobile District archaeological staff conducted a pedestrian survey of 18.5 miles from the entrance of Panama City Harbor to the mouth of Phillips Inlet and based on their lack of positive findings, recommended that there appeared to be little or no potential for intact significant cultural properties in the project area. The Florida SHPO concurred with their findings on December 7, 1989. Further correspondence regarding the beach portion and proposed borrow areas in 1994 restated the same recommendations that the beach retained low potential for intact cultural properties and proposed that the project would have no effect to historic properties listed, or eligible for listing, in the National Register of Historic Places. Again, the Florida SHPO concurred with this recommendation in a letter dated July 11, 1994 (project file no. 941852).

The cultural properties surrounding Lake Powell would not be affected by this undertaking. Given the recent heavy beach erosion resulting from Hurricanes Opal, Georges, Ivan, and Dennis, it is reasonable to suggest that the area of potential effect still has a low probability for the presence of intact, significant cultural properties. Additionally, the proposed shoreline restoration would involve the creation of protective storm berm using the placement of suitable beach quality sand obtained from existing approved offshore borrow areas. This storm berm would hinder the northern advance of the shoreline as a result of further erosion and serve to protect the nearby cultural properties along the southern boundary of Lake Powell. Therefore, it is the opinion of the Corps, Mobile District that this project would have no effect on historic properties, and would serve as a protective measure to surrounding resources.

The Corps, Mobile District requested concurrence from the Department of State, Division of Historic Resources with our finding of no historic properties affected by the proposed action as per 36 CFR 800.4(d)(1) via letter dated March 7, 2008.

4.15 Cumulative Effects Summary. Cumulative impacts are those impacts on the environment that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-federal) or person undertakes such other actions. This section analyzes the proposed action as well as any connected, cumulative, and similar existing and potential actions occurring in the area surrounding the site.

No projects are known to be interdependent upon this project. It is likely that renourishment events in the action area would occur in the future to maintain the beach design profile and additional sand sources would be used. Renourishment intervals are expected to be on average

once every 10 years provided that the area is not severely impacted by tropical storm events. Several other known beach renourishment are occurring, have recently occurred or are expected to occur within the Florida Panhandle. These include: Pensacola Beach Restoration (8.2 miles of shoreline), Navarre Beach and Dune (3.6 miles of shoreline), and Walton County/City of Destine Beach renourishment (6.9 miles of shoreline and a 210 acre borrow area). In addition there is a proposed sand bypassing unit for the Mexico Beach Canal which is currently within the FDEP permitting process. This project if approved would consist of annual bypassing of sand via a hydraulic dredge from a 1.6 acre beach site west of the pass to a 4,500 foot stretch of beach to the east. The combined footprint is approximately 514 acres of seafloor and 37 miles of the shoreline. Not all of these projects are expected to occur within the same renourishment cycle (year), thus providing time for the natural system to recover. Cumulative impacts that would arise from renourishment efforts are anticipated to be remote due to the conservation measures typically incorporated in to beach nourishment projects, the dynamic nature of the nearshore zone and the rapid recovery time of the benthic assemblages.

5.0 STATUS OF ENVIRONMENTAL COMPLIANCE

5.1 National Environmental Policy Act of 1969. Environmental information on the project has been compiled and this draft EA has been prepared in accordance with the NEPA.

5.2 Endangered Species Act of 1973. This proposed action has been coordinated with the USFWS and NMFS. Terms and Conditions of the Services' amended BOs would be incorporated into the final document to ensure full compliance with the Act.

5.3 Coastal Zone Management Act of 1972. The Mobile District, Corps determined that the proposed action is consistent with the Florida Coastal Management Program to the maximum extent practicable. The effect of this project on the coastal zone would be to enhance the zone's appearance and suitability for beach-type recreation and to restore some of the coastal zone's ability to provide protection against storms and flooding. Restoration of the State's beaches is a policy statement with the state Coastal Zone Management Plan Chapter 161 (Coastal Construction).

5.4 Clean Air Act of 1972. No air quality permits are required for this project.

5.5 Clean Water Act of 1972. A modification to the Section 401 water quality certification is being requested from the FDEP (permit #0128852-001-JC). No work would occur until the State has issued water quality certification for the proposed action. It is expected that all state water quality standards would be met. A draft Section 404(b)(1) evaluation is included in this report as Appendix A.

5.6 Rivers and Harbors Act of 1899. The proposed work would not obstruct navigable waters of the United States.

5.7 National Historic Preservation Act of 1966 (INTER ALIA) -(PL 89-665, the Archeology and Historic Preservation Act (PL 93-291), and executive order 11593). Archival research and field work, have been conducted and consultation with the Florida SHPO is being conducted

in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. SHPO consultation was initiated March 7, 2008.

5.8 Migratory Bird Treaty Act. No migratory birds would be adversely affected by project activities.

5.9 Coastal Barrier Resources Act and Coastal Barrier Improvement Act of 1990.

The proposed action occurs within a portion of Philips Inlet CBRA Unit P31. According to the USFWS email dated March 29, 2006 this area is an "Otherwise Protected" area (Enclosure 1). The only restriction on the property concerns the prohibition of federally subsidized flood insurance.

5.10 Magnuson Fishery Conservation and Management Act. This project is being coordinated with the NMFS, and will be in full compliance with the act.

5.11 Marine Mammal Protection Act of 1972, as amended. Incorporation of the safe guards used to protect threatened or endangered species during project implementation would also protect any marine mammals in the area; therefore, the project is in compliance with this Act.

5.12 Fish and Wildlife Coordination Act of 1958, as amended. This project is being coordinated with the FWS, and will be in full compliance with the act.

5.13 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 disposal of material for beach nourishment. 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.

5.14 Submerged Lands Act of 1953. The project would occur on submerged lands of the State of Florida. The project is being coordinated with the State.

5.15 E.O. 11988, Protection of Children. The proposed action complies with Executive Order 13045, "Protection of Children from Environmental Health Risks and Safety Risks", and does not represent disproportionately high and adverse environmental health or safety risks to children in the United States. The proposed site is not used disproportionately by children.

5.16 E.O. 11990, Environmental Justice. The proposed action complies with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations", and does not represent disproportionately high and adverse human health or environmental effects on minority populations and low-income populations in the United States. The proposed site is not used disproportionately by these populations.

5.17 E.O. 11988, Flood Plain Management. The project is in the base flood plain (100-year flood) and is being evaluated in accordance with this Executive Order. The project will be in compliance with this Act.

6.0 COORDINATION. The general public is being notified of the proposed action via public notice. The public notice is being mailed to Federal and state agencies and the interested public for a 30-day review period. All comments on the action will be considered prior to a decision on the action.

7.0 CONCLUSIONS. The implementation of the proposed action would not have significant adverse impacts on the quality of the environment and an environmental impact statement is not required.

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ENCLOSURE 2
PERTAINANT COORESPONDENCE

DRAFT



IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Field Office
1601 Balboa Avenue
Panama City, FL 32405-3721

Tel: (850) 769-0552
Fax: (850) 763-2177

October 25, 2007

Mr. Kenneth Bradley
Coastal Environmental Team
Planning and Environmental Division
U.S. Army Corps of Engineer, Mobile District
P.O. Box 2288
Mobile, Alabama 36628-0001

Attn: Elizabeth Godsey

Re: FWS Log No. 4-P-97-008; 2008-F-0004
Date Started: September 24, 2007
Applicant: Mobile District, Corps of Engineers
Project Title: Panama City Beach Nourishment
Emergency Restoration, Post-Hurricane Seasons
2004 and 2005
Project Extension - 4,500 feet
Beaches of Bay County
Ecosystem: NE Gulf
County: Bay County, Florida

Dear Mr. Bradley:

This letter constitutes amendment no. 8 to the April 8, 1998, biological opinion (BO) on the Panama City Beaches offshore dredging and beach nourishment project on the beaches of the City of Panama City Beach and Bay County, Florida. The Fish and Wildlife Service (Service) received an email dated September 24, 2007, from Elizabeth Godsey of your staff requesting reinitiation of consultation concerning the completion of nourishment post hurricane seasons of 2004 and 2005 because of project schedule changes and extension of the project 4,500 feet to the west. In addition, the Army Corps of Engineers (Corps) and the Service have concurred that the reinitiation should cover the project in its entirety because of the numerous project changes and corresponding consultations. The U.S. Army Corps of Engineers (Corps) has determined the project will adversely affect nesting loggerhead, green, leatherback, and Kemp's ridley sea turtles as covered under the existing biological opinion for the Panama City Beaches Nourishment project dated April 8, 1998. The Corps has also determined that the proposed work would not adversely affect non-breeding piping plover and would not result in an adverse

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modification of designated critical habitat for the piping plover. Our comments are provided in accordance with the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1351 *et seq.*).

The Service concurs with the determination that the proposed project is covered under the existing BO for effects on nesting sea turtles. The work is to be conducted after the 2007 sea turtle nesting season (October 31) and before the 2008 sea turtle nesting season (May 1) and completion is anticipated within 3 to 4 months. Nourishment will take place between R-91 and R-74. In addition, the project has been extended to include approximately 4,500 feet of shoreline to be restored and includes the beach between R-4.5 and R-0.5.

The Service has determined that the work would not increase the likelihood of take of sea turtles beyond that covered in the existing and amended consultation for the beach nourishment project because the work consists of completing nourishment of areas previously restored, and the nourishment extension area does not cause a significant increase in the project size. We have revised the Reasonable and Prudent Measures (RPMs) and Term and Conditions (T&Cs) to incorporate previous and current changes. For clarification purposes, all of the RPMs and T&Cs are provided and will cover the project work along the entire 17.9 miles of shoreline. These changes will supersede previous RPMs and T&Cs presented in the April 8, 1998 biological opinion and amendments dated April 16, 1999, March 9, 2000, December 18, 2000, March 29, 2001, January 14, 2005, and May 24, 2007.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measures are necessary and appropriate to minimize take of the loggerhead, green, leatherback, and Kemp's ridley sea turtles in the proposed beach nourishment.

1. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence shall be used for the beach nourishment.
2. Surveys for nesting sea turtles shall be conducted during the year the project is conducted and for at least three years following project completion.
3. The project shall be scheduled to ensure that nests laid between R-0.5 and R-25.75 between May 1 and July 15 shall be protected by leaving them *in situ*. All other turtle nests that are laid in the area of active beach nourishment or within 70 days of beach nourishment shall be relocated to minimize sea turtle nest burial, crushing of eggs, or nest excavation.
4. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, beach compaction shall be monitored and tilling shall be conducted as needed to reduce the likelihood of impacting sea turtle nesting and hatching activities.
5. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, monitoring shall be conducted to determine if escarpments are present, and

if present, shall be leveled as needed to reduce the likelihood of impacting sea turtle nesting activities.

6. The sea turtle conservation measures are accomplished and completed as detailed in this incidental take statement.
7. The contractors conducting the beach nourishment work shall fully understand the sea turtle protection measures detailed in this incidental take statement.
8. During the sea turtle nesting season, construction equipment and materials shall be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.
9. During the sea turtle nesting season, lighting associated with the project shall be minimized to reduce the possibility of disrupting and disorienting nesting and/or hatchling sea turtles.
10. The Plan and Process to Address Protection of Endangered Sea Turtles on Panama City Beach shall be completed. The existing Beachfront Lighting Ordinance (02-07) shall continue to be enforced.
11. All dune restoration and planting shall be designed and conducted to minimize impacts to sea turtles.
12. Sand fence installation shall occur outside the sea turtle nesting season and utilize the design approved by the Service and Florida Fish and Wildlife Conservation Commission (FWC).
13. A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Service within 60 days of completion of the proposed work for each year when the activity has occurred.
14. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification shall be made to the Service and FWC.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps shall comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

Project Work

1. Beach compatible fill shall be placed on the beach or in any associated dune system. Beach compatible fill is material that maintains the general character and functionality of the material occurring on the beach and in the adjacent dune and coastal system. Such material shall be predominantly carbonate, quartz, or similar material with a particle size distribution

ranging between 0.062mm (4.0Φ) and 4.76mm (-2.25Φ) (classified as sand by either the Unified Soils or the Wentworth classification), shall be similar in color and grain size distribution (sand grain frequency, mean and median grain size and sorting coefficient) to the material in the historic beach sediment at the disposal site and shall not contain:

- 1a. Greater than 5 percent, by weight, silt, clay or colloids passing the #230 sieve (4.0φ);
- 1b. Greater than 5 percent, by weight, fine gravel retained on the #4 sieve (- 2.25φ);
- 1c. Coarse gravel, cobbles or material retained on the 3/4 inch sieve in a percentage or size greater than found on the native beach;
- 1d. Construction debris, toxic material or other foreign matter; and
- 1e. Material that will result in cementation of the beach.

If rocks or other non-specified materials appear on the surface of the filled beach in excess of 50 percent of background in any 10,000-square-foot area, then surface rock should be removed from those areas. These areas shall also be tested for subsurface rock percentage and remediated as required. If the natural beach exceeds any of the limiting parameters listed above, then the fill material shall not exceed the naturally occurring level for that parameter.

2. The applicant or local sponsor shall arrange a meeting between representatives of the contractor, the Service, the FWC, and the permitted sea turtle surveyor prior to the commencement of work on this project. At least 10 business days advance notice shall be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures as well as additional guidelines when construction occurs during the nesting season such as storing equipment, minimizing driving, and follow-up meetings during construction.

Protection of Sea Turtles

1. The project shall be scheduled to keep sea turtle nests *in situ* between R-0.5 and R-25.75 until July 15 within any year the work is conducted. The goal is to protect the highest density of sea turtle nesting in the project area during the peak nesting period by allowing natural development of the sea turtle nests.
2. Daily early morning surveys for sea turtle nests shall be required during the year(s) of the project completion and for three years following the beach nourishment. Nesting surveys shall be initiated 70 days prior to nourishment or dredged channel material placement activities or by May 1, whichever is later. Nesting surveys shall continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys. If nests are deposited between R-25.75 and R-91.75 in areas where

they may be affected by construction activities, eggs shall be relocated per the requirements listed below.

- 2a. Nesting surveys and egg relocations will only be conducted by persons with prior experience and training in these activities and who are duly authorized to conduct such activities through a valid permit issued by FWC, pursuant to FAC 68E-1. Nesting surveys shall be conducted daily between sunrise and 9 a.m. (this is for all time zones). The contractor shall not initiate work until daily notice has been received from the sea turtle permit holder that the morning survey has been completed. Surveys shall be performed in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.
- 2b. Only those sea turtle nests that may be affected by construction activities will be relocated. Nests requiring relocation shall be moved no later than 9 a.m. the morning following deposition to a nearby self-release beach site in a secure setting where artificial lighting will not interfere with hatchling orientation. Relocated nests shall not be placed in organized groupings; relocated nests shall be randomly staggered along the length and width of the beach in settings that are not expected to experience daily inundation by high tides or known to routinely experience severe erosion and egg loss, or subject to artificial lighting. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests.
- 2c. Sea turtle nests deposited within areas where construction activities have ceased or will not occur for 70 days shall be marked and left *in situ* unless other factors threaten the success of the nest. The turtle permit holder shall install an on-beach marker at the nest site and/or a secondary marker at a point landward as possible to assure that future location of the nest will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string shall be installed to establish a 10-foot radius around the nest. No activity will occur within this area nor will any activities occur which could result in impacts to the nest. Nest sites shall be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the restoration activity.
3. During the sea turtle nesting season, the contractor shall not extend the beach fill more than 500 feet along the shoreline between dusk and the following day until the daily nesting survey has been completed and the beach cleared for fill advancement. If the 500 feet is not feasible for the project, an agreed upon distance will be decided on during the preconstruction meeting. Once the beach has been cleared and the necessary nest relocations have been completed, the contractor shall be allowed to proceed with the placement of fill during daylight hours until dusk at which time the 500-foot length limitation shall apply.
4. Immediately after completion of the project and prior to April 15, for three (3) subsequent years, sand compaction shall be monitored in the area of restoration in accordance with a protocol agreed to by the Service, the FWC, and the Corps or local sponsor. At a minimum,

the protocol provided under 4a and 4b below shall be followed. If tilling is required, the area shall be tilled to a depth of 36 inches. All tilling activity shall be completed prior to those dates listed above.

Each pass of the tilling equipment shall be overlapped to allow more thorough and even tilling. If the project is completed during the nesting season, tilling shall not be performed in areas where nests have been left in place or relocated. (NOTE: The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Additionally, out-year compaction monitoring and remediation are not required if placed material no longer remains on the dry beach.) A report on the results of the compaction monitoring shall be submitted to the Service's Panama City Florida Field Office prior to any tilling actions being taken.

- 4a. Compaction sampling stations shall be located at 500-foot intervals along the project area. One station shall be at the seaward edge of the dune/bulkhead line (when material is placed in this area), and one station shall be midway between the dune line and the high water line (normal wrack line).
- 4b. At each station, the cone penetrometer shall be pushed to a depth of 6, 12, and 18 inches three times (three replicates). Material may be removed from the hole if necessary to ensure accurate readings of successive levels of sediment. The penetrometer may need to be reset between pushes, especially if sediment layering exists. Layers of highly compact material may lie over less compact layers. Replicates shall be located as close to each other as possible, without interacting with the previous hole and/or disturbed sediments. The three replicate compaction values for each depth shall be averaged to produce final values for each depth at each station. Reports will include all 18 values for each transect line, and the final 6 averaged compaction values.
- 4c. If the average value for any depth exceeds 500 pounds per square inch (psi) for any two or more adjacent stations, then that area shall be tilled immediately prior to the following dates listed above.
- 4d. If values exceeding 500 psi are distributed throughout the project area but in no case do those values exist at two adjacent stations at the same depth, then consultation with the Service shall be required to determine if tilling is required. If a few values exceeding 500 psi are present randomly within the project area, tilling shall not be required.
- 4e. Tilling shall occur landward of the wrack line and avoid all vegetated areas three (3) square feet or greater with a three (3) square foot buffer around the vegetated areas.
5. Visual surveys for escarpments along the project area shall be made immediately after completion of the project and prior to April 15 for three (3) subsequent years. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet shall be leveled and the beach profile shall be reconfigured to minimize scarp formation.

If the project is completed during the sea turtle nesting and hatching season, escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. Surveys for escarpments shall be conducted weekly. Results of the surveys shall be submitted within one month to the Service's Panama City, Florida Field Office prior to any action being taken during the nesting season. The Service shall be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Service will provide a brief written authorization that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken shall be submitted to the Service's Panama City, Florida Field Office. (NOTE: Out-year escarpment monitoring and remediation are not required if placed material no longer remains on the beach).

6. Staging areas for construction equipment shall be located off the beach to the maximum extent practicable from May 1 to October 31. Nighttime storage of construction equipment not in use shall be off the beach to minimize disturbance to sea turtle nesting and hatching activities. In addition, all construction pipes that are placed on the beach shall be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system. Temporary storage of pipes shall be off the beach to the maximum extent possible. Temporary storage of pipes on the beach shall be in such a manner so as to impact the least amount of nesting habitat and shall not compromise the integrity of the dune systems. Pipes placed parallel to the dune shall be five to ten feet away from the toe of the dune.
7. Direct lighting of the beach and nearshore waters shall be limited to the immediate construction area and shall comply with safety requirements from May 1 to October 31. Lighting on offshore or onshore equipment shall be minimized through reduction, shielding, lowering, and appropriate placement to avoid excessive illumination of the waters surface and nesting beach while meeting all Coast Guard, EM 385-1-1, and OSHA requirements. Light intensity of lighting plants shall be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields shall be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area (Figure 1).

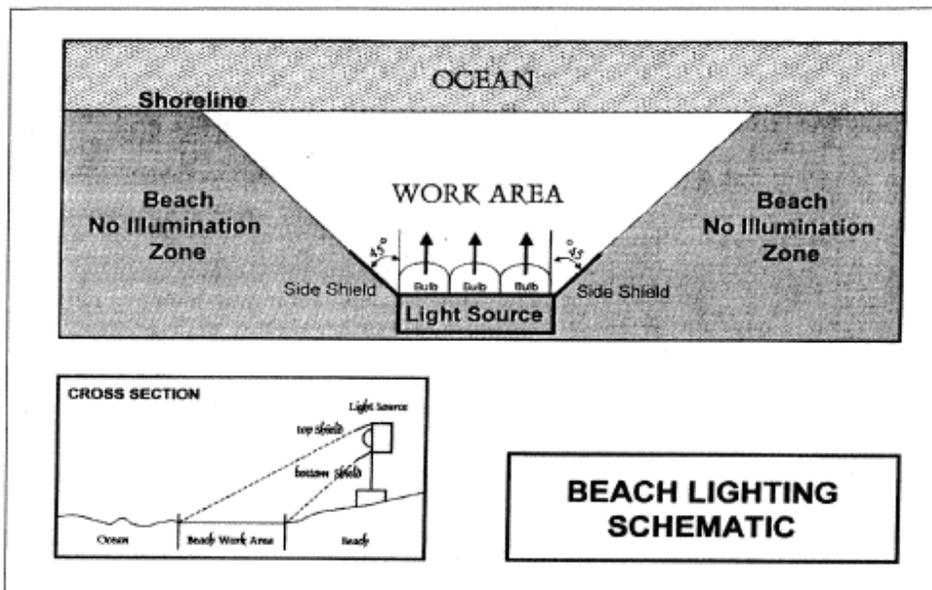


Figure 1. Beach lighting schematic.

8. The Plan and Process to Address Protection of Endangered Sea Turtles on Panama City Beach shall be completed and include the following.
 - a. A general lighting survey of the beach shall be completed. The lighting survey was completed in July of 2007.
 - b. A recommended lighting ordinance shall be developed and recommended by the Bay County Tourist Development Council (TDC) for adoption by the Bay County Board of County Commissioners and the City of Panama City Beach Council by December 31, 2007.
 - c. The TDC shall continue to coordinate with the Panama City Beach Community Redevelopment Area (CRA) concerning the use of wildlife lighting within the CRA coverage area.
 - d. The Bay County TDC shall identify and publicize to property owners, managers, and municipalities the availability of State-supported mitigation grant programs to assist those property owners, managers, and municipalities in implementing wildlife lighting changes.
 - e. The TDC shall research and provide community education programs on wildlife lighting.

- f. The TDC shall work with the local sea turtle permit surveyor to minimize impacts to sea turtle nests from artificial lighting during the 2007 nesting season. The Bay County TDC modified the contract with the Turtle Watch program in 2007 to implement additional nest monitoring; however, none was needed.
 - g. The TDC shall work with the Service to address the Service's comments on the Plan dated April 12, 2007.
 - h. The TDC shall coordinate with Bay County to emphasize the need for continued enforcement of the existing Bay County Beachfront Lighting Ordinance (02-07).
 - i. The TDC shall continue to address and seek resolution of other issues and sea turtle nesting on the beaches of Bay County including driving on the beach by vendors, law enforcement, beach patrol and other entities, beach cleaning, trash pick up, beach furniture remaining on the beach at night, and recreational and other activities.
 - j. The TDC shall research and promote eco-friendly tourism.
9. Dune vegetation planting may occur during the sea turtle nesting season (May 1 through October 31) and planting shall be by hand with the following conditions implemented.
- 9a. Daily early morning sea turtle nesting surveys shall be conducted during the period from May 1 through October 31. Sea turtle nesting surveyors shall have a valid FWC permit. Nest surveys shall be conducted daily between sunrise and 9 a.m. (all times). No dune planting activity shall occur until after the daily turtle survey and nest conservation and protection efforts have been completed.
 - 9b. Sea turtle nesting surveys shall be initiated 70 days prior to dune planting activities or by May 1, whichever is later. Nesting surveys shall continue through the end of the project or through September 1, whichever is earlier. Hatching and emerging success monitoring will involve checking nests beyond the completion date of the daily early morning nesting surveys.
 - 9c. Any sea turtle nests deposited in the dune planting area not requiring relocation for conservation purposes shall be left *in situ*. The turtle permit holder shall install an on-beach marker at the nest site and a secondary marker at a point as far landward as possible to assure that future location of the nest will be possible should the on-beach marker be lost. A series of stakes and highly visible survey ribbon or string shall be installed to establish an area of 3-foot radius surrounding the nest. No planting or other activity shall occur within this area nor will any activities occur which could result in impacts to the nest. Nest sites shall be inspected daily to assure nest markers remain in place and the nest has not been disturbed by the planting activity.

- 9d. If a nest is disturbed or uncovered during planting activity, all work shall cease and the responsible turtle permit holder be immediately contacted. If a nest(s) cannot be safely avoided during planting, all activity within the affected project site shall be delayed until hatching and emerging success monitoring of the nest is completed.
- 9e. All dune planting activities shall be conducted by hand and only during daylight hours.
- 9f. All dune vegetation shall consist of coastal dune species native to the local area (i.e., native to coastal dunes in the respective county and grown from plant stock from that region of Florida). Seedlings shall be at least 1 inch by 1 inch with a 2.5-inch pot. Planting shall be on 18-inch centers throughout the created dune; however, 24-inch centers may be acceptable depending on the acreage of the area to be planted and the size of the plants. Vegetation shall be planted with an appropriate amount of fertilizer and anti-desiccant material, as appropriate, for the plant size.
- 9g. No use of heavy equipment (trucks) shall occur on the dunes or seaward for planting purposes. A lightweight (ATV type) vehicle, with tire pressures of 10 psi or less may be operated on the beach. If lightweight vehicles are unavailable, heavy vehicles may be used provided they are operated along the beach seaward of the wrack or debris line (previous high tide) or just above it during high tide conditions. The vehicles shall be parked in this area and equipment or materials shall be hand carried to the work site.
- 9h. All irrigation equipment shall be authorized under a Florida Department of Environmental Protection (FDEP) permit.
- 10. Sand fencing or other dune restoration material placed in the project area shall be installed outside of the sea turtle nesting season (May 1 through October 31) in accordance with the following conditions:
 - 10a. Sand fencing located seaward of the crest of the primary dune shall be designed and installed with a maximum of ten (10) foot long spurs of sand fencing spaced at a minimum of seven (7) feet on a diagonal alignment (facing the predominant wind direction) for the shore parallel coverage of the subject property (Figure 2).
 - 10b. Upon site inspection by the Service, Florida Department of Environmental Protection - Bureau of Beaches and Coastal Systems, or the FWC - Bureau of Imperiled Species Management, if it is determined that the fence adversely impacts nesting or hatchling turtles, the fence shall be removed or repositioned, as appropriate.

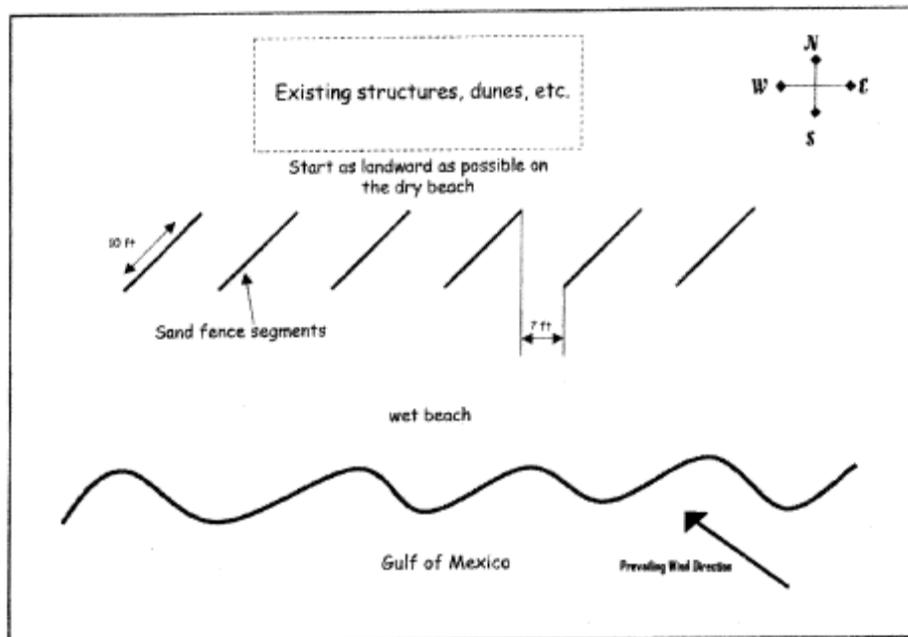


Figure 2. Sand fence alignment for dune restoration fence.

Reporting

1. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for egg relocation for the project shall be notified so the eggs can be moved to a suitable relocation site.
2. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification shall be made within 24 hours to the FWC at 1-888-404-3922, and the Service's Panama City, Florida Field Office at 850-769-0552. Care shall be taken in handling injured turtles or eggs to ensure effective treatment or disposition, and in handling dead specimens to preserve biological materials in the best possible state for later analysis.
3. A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Service's Panama City, Florida Field Office, 1601 Balboa Ave., Panama City, Florida 32405 within 60 days of completing the proposed work for each year when the activity has occurred. This report will include the dates of actual construction activities, names and qualifications of personnel involved in sea turtle nest surveys and relocation activities (separate the nests surveys for nourished and non-nourished areas), descriptions and locations of self-release beach sites, nest survey and relocation results, and the information outlined in Table 1.

Table 1: Sea Turtle Monitoring for Beach Nourishment.

CHARACTERISTIC	PARAMETER	MEASUREMENT	VARIABLE
Nesting Success	False crawls - number	Visual assessment of all false crawls	Number and location of false crawls in nourished areas and non nourished areas: any interaction of the turtle with obstructions, such as groins, seawalls, or scarps should be noted.
	False crawl - type	Categorization of the stage at which nesting was abandoned	Number in each of the following categories: emergence-no digging, preliminary body pit, abandoned egg chamber.
	Nests	Number	The number of sea turtle nests in nourished and non nourished areas should be noted. If possible, the location of all sea turtle nests must be marked on map of project, and approximate distance to sea walls or scarps measured using a meter tape. Any abnormal cavity morphologies should be reported as well as whether turtle touched groins, seawalls, or scarps during nest excavation
		Lost Nests	The number of nests lost to inundation, erosion or the number with lost markers that could not be found.
	Lighting Impacts	Disoriented sea turtles	The number of disoriented hatchlings and adults must be documented and reported in accordance with existing FWC protocol for disorientation events.
Reproductive Success	Emergence & hatching success	Standard survey protocol	Numbers of the following: unhatched eggs, depredated nests and eggs, live pipped eggs, dead pipped eggs, live hatchlings in nest, dead hatchlings in nest, hatchlings emerged, disoriented hatchlings, depredated hatchlings

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. The Service believes that no more than 17.9 miles of habitat for nesting loggerhead, green, leatherback, and Kemp's ridley sea turtles will be incidentally taken. If during the course of the action, this level is exceeded; such incidental take represents new information requiring initiation 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.

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. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.
2. Stormwater related structures that interfere with female sea turtles approaching, digging nests, and depositing eggs on the beach or with hatchling sea turtles from emerging from the nest and crawling to the Gulf of Mexico, or successful incubation of deposited nests should be removed from the nesting beach.
3. To increase public awareness about sea turtles, informational signs should be placed at beach access points where appropriate. The signs should explain the importance of the beach to sea turtles and/or the life history of sea turtle species that nest in the area.
4. Beach nourishment should not occur on publicly owned conservation lands during the sea turtle nesting season.
5. Dune restoration and protection should be continued as needed.
6. Dune walkovers and parking areas should be constructed where appropriate to protect dune habitats at public beach access points.

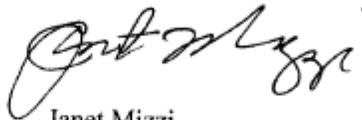
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

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; (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; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

For this biological opinion the incidental take would be exceeded when the take exceeds dredged material placement along 17.9 miles of Gulf of Mexico beachfront which has been exempted from the prohibitions of section 9 by this opinion. The Service appreciates the cooperation of the Corps and the Bay County Tourist Development Council during this consultation. If you have any questions about this opinion, please contact Lorna Patrick of this office at extension 229.

Sincerely yours,



Janet Mizzi
Deputy Field Supervisor

cc:

FWS, Jacksonville, FL (Nicole Adimey and Sandy MacPherson)
NMFS, Protected Species, St. Petersburg, FL
FWC, Non-game Program, Panama City, FL (John Himes)
FWC, Imperiled Species Mgt. Section, Tallahassee, FL (Robbin Trindell)
FDEP, Office of Beaches and Coastal Systems, Tallahassee, FL
Kennard Watson, RMA, Turtle Watch Program, PCB, FL
Lisa Armbruster, Bay County Tourist Development Council, PCB, FL
Bay County Board of County Commissioners, Bay County, FL
City of Panama City Beach, PCB, FL

Section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. § 1531 *et seq.*), requires that each federal agency shall ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such species. When the action of a federal agency may affect a protected species or its critical habitat, that agency is required to consult with either NMFS or the U.S. Fish and Wildlife Service (USFWS), depending upon the protected species that may be affected.

Formal consultations are required when action agencies determine that a proposed action "may affect" listed species or designated critical habitat. Formal consultations on most listed marine species and their designated critical habitat are conducted between the action agency and NMFS. Consultations are concluded after NMFS' issuance of an opinion that identifies whether a proposed action is likely to jeopardize the continued existence of a listed species, or destroy or adversely modify critical habitat. The opinion also states the amount or extent of incidental taking that may occur. Measures to reduce the effect of takes of listed species are developed (i.e., reasonable and prudent measures (RPMs)) and conservation recommendations are made. Notably, no incidental destruction or adverse modification of critical habitat can be authorized, and thus there are no RPMs, only reasonable and prudent alternatives that must avoid destruction and adverse modification. The issuance of an opinion detailing NMFS' findings concludes ESA section 7 consultation.

NMFS originally concluded consultation on this project with the issuance of a biological opinion dated February 11, 2005; however, the COE has subsequently modified the proposed action in a manner that causes an effect to Gulf sturgeon critical habitat that was not considered in the February 11, 2005, biological opinion (the proposed modification will affect more Gulf sturgeon critical habitat). This opinion determines species not likely to be affected by the proposed modification, and reanalyzes the project impacts on Gulf sturgeon critical habitat, in accordance with section 7 of the Endangered Species Act (ESA) of 1973 as amended. NMFS concludes in the opinion that the modification of the proposed action is not likely to destroy or adversely modify designated Gulf sturgeon critical habitat. This opinion is based on project-specific information provided by the MDCOE, the previous consultation, and NMFS' review of published literature.

1 CONSULTATION HISTORY

NMFS received a request from MDCOE on December 29, 2004, for section 7 consultation on the project. MDCOE determined that the proposed action will have "no effect" on protected species under NMFS' purview, and is "not likely to adversely affect" Gulf sturgeon critical habitat, and requested concurrence with their determination.

NMFS requested additional information via e-mail on January 11, 2005; a response from MDCOE was received January 20, 2005. Between January 20 and January 31, 2005, additional project specifics were clarified via e-mail, fax, and telephone. NMFS issued its opinion for the project on February 11, 2005.

MDCOE proposed modifications to the original project and requested reinitiation of section 7 consultation on August 11, 2006. MDCOE determined that the project modifications would not result in adverse effects to Gulf sturgeon or permanent destruction or adverse modification of Gulf sturgeon critical habitat, and requested concurrence with these determinations. Additional project details were provided by MDCOE on December 13, 2006, and February 14 and 15, 2007.

1.1 Reinitiation Analysis

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 taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

The modifications to the original proposed action include: (1) a recommitment of dredging in borrow area BA 5C, (2) an additional borrow area, BA 11, and (3) an extension of the beach restoration work 4,500 feet westward. These modifications represent additional impacts to Gulf sturgeon critical habitat that were not considered in the February 11, 2005, opinion. Therefore, NMFS considers the project to be modified in a manner that causes an effect to critical habitat that was not considered in the original biological opinion.

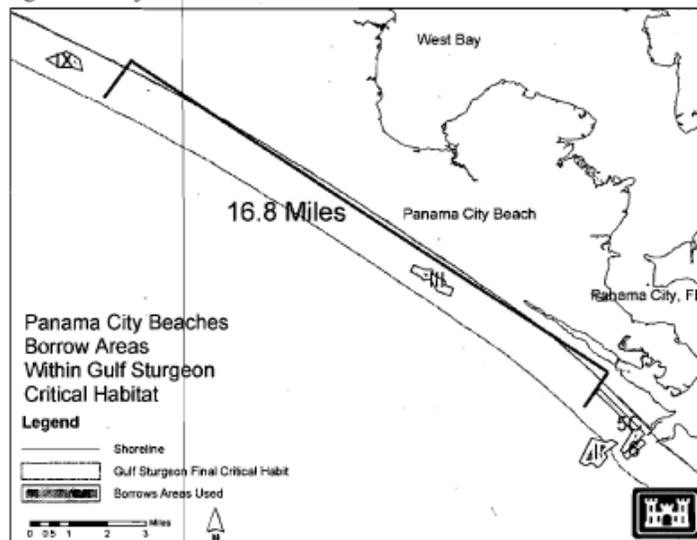
2 DESCRIPTION OF THE PROPOSED ACTION AND AREA

2.1 Proposed action

The original emergency beach nourishment project for Panama City, Florida, beaches proposed to place up to 4.0 million cubic yards of sand along 16.8 miles of shoreline (Figure 1) to replace sand lost to Hurricane Ivan in 2004 and other sources of erosion since 1999. Sand was to be removed from nearshore borrow areas, totaling approximately 316 acres, via hydraulic dredge and placed on the dry beach in a constructible template and into the swash zone (the region where the surf outwash spends itself). Placement of sand would convert 2,535 acres of subtidal habitat to emergent beach. Over time, natural waves were expected to spread the sand over the active beach profile, achieving a natural profile. The project was scheduled to be constructed between February and June 2005. As the project commenced, due to insufficient dredge production rates, loss of sand and construction time during the highly active 2005 hurricane season, and the discovery of obstructions in some of the borrow areas, it was determined that an additional 1 million cubic yards of sand would be needed for completion of the Panama City Beaches Renourishment Project to full project design. In response to this need, MDCOE proposes to modify the original project to include: (1) a recommitment of dredging in borrow area BA 5C, (2) an additional borrow area, BA 11, and (3) an extension of the beach restoration work 4,500 feet westward.

Dredging in BA 5C was authorized for the original project; however, it was delayed due to buried debris encountered by the dredge in November 2005. MDCOE proposes to continue dredging in BA 5C to obtain the necessary quantities of sand. Approximately 53 acres in size, BA 11 is located 4,000 feet south of Shell Island in the eastern lobe of the St. Andrew Inlet ebb tidal shoal; the existing grade varies between -27 to -34 feet. Sand will be removed from a maximum depth of 15 feet within the borrow sites using either a hydraulic dredge or a hopper dredge and pumped onto the beach via a 30- to 36-inch submerged pipeline. The pipeline would require approximately 20 relocations over the course of the project to allow even distribution of sand on the beach. The sand resources at the borrow sites have been determined to be compatible to that currently on the beach. Grain sizes at the borrow sites range from 0.19 to 0.34 millimeters, with a mean grain size of 0.25 millimeters. Grain sizes from the beach range from 0.25 to 0.32 millimeters, with a mean grain size of 0.28 millimeters. Sediment composition at the borrow sites will not be altered by the dredging as only sandy material suitable for beach placement will be removed, leaving the margins of sand in place. The original project included placement of sand for beach renourishment between Florida Department of Environmental Protection monuments F-93 to F-4.5; MDCOE is proposing to extend renourishment activities 4,500 feet westward to include the beach between F-4.5 and F-0.5. The modifications to the Panama City Beaches Renourishment Project will result in an additional 54 acres of dredging and the placement of fill on an additional 22 acres of waterbottoms. The project is expected to begin in July 2007 and end in January 2008.

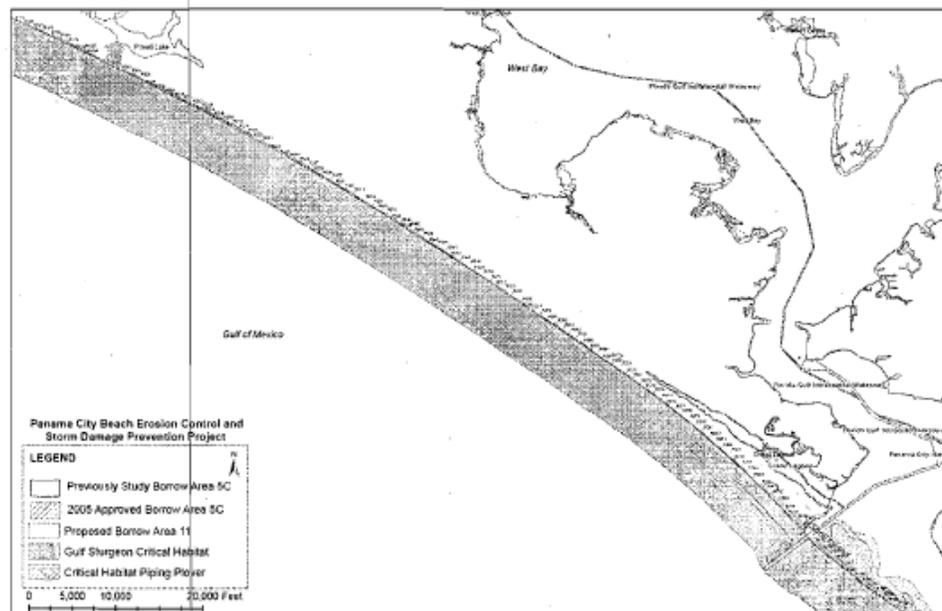
Figure 1. Project Area



2.2 Effects on Listed Species

Activities associated with the removal of materials from the borrow sites by hopper dredge have already been analyzed in the November 19, 2003, Regional Biological Opinion (RBO) entitled "Dredging of Gulf of Mexico Navigation Channels and Sand Mining ("Borrow") Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts (Consultation Number F/SER/2000/01287)." The proposed action considered and analyzed within that RBO included federal, federally-permitted, or federally-sponsored hopper dredging of all U.S. Gulf of Mexico sand mining areas ("borrow sites") and virgin (previously unused) sand mining areas for beach renourishment, restoration, and protection projects. In that opinion, NMFS concluded that sea turtles and Gulf sturgeon can be adversely affected by hopper dredges and included an Incidental Take Statement (ITS), pursuant to section 7 of the ESA. The ITS in the RBO contains RPMs with implementing terms and conditions to help minimize this take. MDCOE stated it will abide by the RPMs contained in the RBO; therefore, the effects of hopper dredging will not be discussed further in this opinion. In addition, the 2003 RBO addressed the potential impacts of relocation trawling activities associated with hopper dredging. The RBO found that takes by trawls are likely, but those takes are not expected to be injurious or lethal due to the short duration of the tow times and the required safe-handling procedures. Therefore, the effects of relocation trawling will not be discussed further in this opinion.

Figure 2. Borrow Areas BA 11 and BA 5C.



The RBO does not consider the effects of sand mining nor of beach renourishment in designated Gulf sturgeon critical habitat. NMFS believes effects on Gulf sturgeon critical habitat using either a hopper dredge or a hydraulic pipeline dredge will be the same.

2.2 Action area

The project area is the Gulf of Mexico, adjacent to the Panama City, Florida. The action area will be from Phillip's Inlet in the west to the entrance channel at St. Andrew Bay and extends offshore to the outer boundary of the outer most borrow area (BA 11), just under one nautical mile (NM) offshore.

3 STATUS OF THE CRITICAL HABITAT

3.1 Background

Gulf sturgeon critical habitat was jointly designated by NMFS and USFWS on April 18, 2003 (50 CFR 226.214). Critical habitat is defined in section 3(5)(A) of the ESA as (i) the specific areas within the geographic area occupied by a species, at the time it is listed in accordance with the Act, on which are found those physical or biological features (I) essential to the conservation of the species and (II) that may require special management considerations or protection; and (III) specific areas outside the geographic area occupied by a species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. "Conservation" is defined in section 3(3) of the ESA as the use of all methods and procedures that are necessary to bring any endangered or threatened species to the point at which listing under the ESA is no longer necessary.

Gulf sturgeon critical habitat includes areas within the major river systems that support the seven currently reproducing subpopulations (USFWS et al. 1995) and associated estuarine and marine habitats. Gulf sturgeon use the rivers for spawning, larval and juvenile feeding, adult resting and staging, and to move between the areas that support these components. Gulf sturgeon use the lower riverine, estuarine, and marine environments during winter months primarily for feeding and, more rarely, for inter-river migrations. Estuaries and bays adjacent to the riverine units provide unobstructed passage of sturgeon from feeding areas to spawning grounds.

Fourteen areas (units) are designated as Gulf sturgeon critical habitat. Critical habitat units encompass approximately 2,783 river kilometers (km) and 6,042 km² of estuarine and marine habitats and include portions of the following Gulf of Mexico rivers, tributaries, estuarine, and marine areas:

- Unit 1 = Pearl and Bogue Chitto Rivers in Louisiana and Mississippi
- Unit 2 = Pascagoula, Leaf, Bowie, Big Black Creek, and Chickasawhay Rivers in Mississippi
- Unit 3 = Escambia, Conecuh, and Sepulga Rivers in Alabama and Florida
- Unit 4 = Yellow, Blackwater, and Shoal Rivers in Alabama and Florida
- Unit 5 = Choctawhatchee and Pea Rivers in Florida and Alabama
- Unit 6 = Apalachicola and Brothers Rivers in Florida

- Unit 7 = Suwannee and Withlacoochee Rivers in Florida
- Unit 8 = Lake Pontchartrain (east of causeway), Lake Catherine, Little Lake, the Rigolets, Lake Borgne, Pascagoula Bay, and Mississippi Sound systems in Louisiana and Mississippi, and sections of the state waters within the Gulf of Mexico
- Unit 9 = Pensacola Bay system in Florida
- Unit 10 = Santa Rosa Sound in Florida
- Unit 11 = Nearshore Gulf of Mexico in Florida
- Unit 12 = Choctawhatchee Bay system in Florida
- Unit 13 = Apalachicola Bay system in Florida, and
- Unit 14 = Suwannee Sound in Florida

Critical habitat determinations focus on those physical and biological features (primary constituent elements = PCEs) that are essential to the conservation of the species (50 CFR 424.12). Federal agencies must ensure that their activities are not likely to result in the destruction or adverse modification of the PCEs within defined critical habitats. Therefore, proposed actions that may impact designated critical habitat require an analysis of potential impacts to each PCE.

PCEs identified as essential for the conservation of the Gulf sturgeon consist of:

- (1) Abundant food items, such as detritus, aquatic insects, worms, and/or molluscs, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, molluscs and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages;
- (2) Riverine spawning sites with substrates suitable for egg deposition and development, such as limestone outcrops and cut limestone banks, bedrock, large gravel or cobble beds, marl, soapstone, or hard clay;
- (3) Riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, generally, but not always, located in holes below normal riverbed depths, believed necessary for minimizing energy expenditures during fresh water residency and possibly for osmoregulatory functions;
- (4) A flow regime (i.e., the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) necessary for normal behavior, growth, and survival of all life stages in the riverine environment, including migration, breeding site selection, courtship, egg fertilization, resting, and staging, and for maintaining spawning sites in suitable condition for egg attachment, egg sheltering, resting, and larval staging;
- (5) Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages;

- (6) Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages; and
- (7) Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

As stated in the final rule designating Gulf sturgeon critical habitat, the following activities, among others, when authorized, funded or carried out by a federal agency, may destroy or adversely modify critical habitat:

- (1) Actions that would appreciably reduce the abundance of riverine prey for larval and juvenile sturgeon, or of estuarine and marine prey for juvenile and adult Gulf sturgeon, within a designated critical habitat unit, such as dredging; dredged material disposal; channelization; in-stream mining; and land uses that cause excessive turbidity or sedimentation;
- (2) Actions that would appreciably reduce the suitability of Gulf sturgeon spawning sites for egg deposition and development within a designated critical habitat unit, such as impoundment; hard-bottom removal for navigation channel deepening; dredged material disposal; in-stream mining; and land uses that cause excessive sedimentation;
- (3) Actions that would appreciably reduce the suitability of Gulf sturgeon riverine aggregation areas, also referred to as resting, holding, and staging areas, used by adult, subadult, and/or juveniles, believed necessary for minimizing energy expenditures and possibly for osmoregulatory functions, such as dredged material disposal upstream or directly within such areas; and other land uses that cause excessive sedimentation;
- (4) Actions that would alter the flow regime (the magnitude, frequency, duration, seasonality, and rate-of-change of fresh water discharge over time) of a riverine critical habitat unit such that it is appreciably impaired for the purposes of Gulf sturgeon migration, resting, staging, breeding site selection, courtship, egg fertilization, egg deposition, and egg development, such as impoundment; water diversion; and dam operations;
- (5) Actions that would alter water quality within a designated critical habitat unit, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, such that it is appreciably impaired for normal Gulf sturgeon behavior, reproduction, growth, or viability, such as dredging; dredged material disposal; channelization; impoundment; in-stream mining; water diversion; dam operations; land uses that cause excessive turbidity; and release of chemicals, biological pollutants, or heated effluents into surface water or connected groundwater via point sources or dispersed non-point sources;

- (6) Actions that would alter sediment quality within a designated critical habitat unit such that it is appreciably impaired for normal Gulf sturgeon behavior, reproduction, growth, or viability, such as dredged material disposal; channelization; impoundment; in-stream mining; land uses that cause excessive sedimentation; and release of chemical or biological pollutants that accumulate in sediments; and
- (7) Actions that would obstruct migratory pathways within and between adjacent riverine, estuarine, and marine critical habitat units, such as dams, dredging, point-source-pollutant discharges, and other physical or chemical alterations of channels and passes that restrict Gulf sturgeon movement (68 FR 13399).

The proposed action, due to its location, will have no effect on riverine spawning sites, riverine aggregation areas, and freshwater flow regimes. The proposed action will occur in critical habitat Unit 11. The borrow sites and the beach renourishment areas are located entirely within the unit. Because the borrow areas are within designated critical habitat, the removal of sand from the borrow areas will modify habitat. The placement of sand onto the beach and into the swash zone during beach renourishment will also modify habitat. Therefore, NMFS believes that designated critical habitat for the Gulf sturgeon may be adversely affected by the project.

3.2 Primary constituent elements of Gulf sturgeon critical habitat that will not be adversely affected

3.2.1 Water quality

Water quality impacts as a result of this project were considered. While there will be some turbidity associated with dredging sand from the borrow sites and placing it on the beach, it will be relatively low due to the low silt content (0.9%) of the sand. In addition, the silt content in sand from the borrow sites is similar to that currently on the beach (0.7%). Impacts from sediment disturbance as a result of removing sand from the borrow sites and placing sand on the beach and in the swash zone are expected to be temporary, with suspended particles settling out within a short time frame without significant effects on water quality (or on listed species directly). No changes in temperature, salinity, pH, hardness, oxygen content, and other chemical characteristics are expected. Therefore, NMFS believes that effects to water quality will be insignificant and will not be considered further in this opinion.

3.2.2 Sediment quality

Sediment quality impacts resulting from the removal of sand from borrow areas and its deposition on the beach were considered. Potential changes in the sediment quality at the borrow sites are not expected; studies conducted for the original project showed that the deposits within the borrow sites are homogenous, so that removal of the upper layers of sediment will uncover lower layers containing sediment of a similar character (CP&E 2005). Further, it is expected that the borrow area would fill quickly, returning to its original contours, given its location in a high sediment transport area. Sand placed on the beach and in the adjacent swash zone will be of

similar grain size and composition to the existing sand. Therefore, NMFS believes that any effects to sediment will be insignificant and will not be considered further in this opinion.

3.2.3 Migratory pathways

Effects on migratory pathways as a PCE in Unit 11 were considered in this opinion. The primary migration pattern in the area would be parallel to the shoreline in the nearshore area. Though the proposed action is occurring adjacent to a pass, it is not occurring adjacent to a spawning river. In addition, dredging will primarily occur in an open water environment (depths in excess of 25 feet), while renourishment activities will occur in very shallow water adjacent to the beach, allowing sufficient area for passage of individuals around the project activity. No significant short-term or long-term effects to migratory passage are expected. NMFS concludes from the active project locations that the proposed activity will have insignificant effects on the ability of Unit 11 to provide a migratory pathway for Gulf sturgeon.

4 ENVIRONMENTAL BASELINE

This section identifies and discusses past and ongoing human and natural factors leading to the current status of the designated critical habitat within the action area. The environmental baseline is a "snapshot" of the action area at a specified point in time and includes state, tribal, local, and private actions already affecting the critical habitat that will occur contemporaneously with the consultation in progress. Unrelated federal actions affecting the critical habitat that have completed formal or informal consultation are also part of the environmental baseline, as are federal and other actions within the action area that may benefit critical habitat.

4.1 Status of critical habitat within the action area

Of the fourteen units designated as Gulf sturgeon critical habitat, only Unit 11 will be impacted by the Panama City Beaches renourishment project. Unit 11 includes a portion of the Gulf of Mexico as defined by the following boundaries: the western boundary is the line of longitude 87°20.0'W, approximately 1 NM (1.9 km) west of Pensacola Pass from its intersection with the shore to its intersection with the southern boundary; the northern boundary is the mean high water line of the mainland shoreline and the 72 COLREGS lines at passes, as defined at 30 CFR 80.810 (a-g); the southern boundary of the unit is 1 NM (1.9 km) offshore of the northern boundary; and, the eastern boundary is the line of longitude 85°17.0'W from its intersection with the shore near Money Bayou between Cape San Blas and Indian Peninsula to its intersection with the southern boundary. This area includes nearshore Gulf of Mexico waters in Escambia, Santa Rosa, Okaloosa, Walton, Bay, and Gulf counties in Florida.

The nearshore littoral zone benthic community of Unit 11 is comprised primarily of medium and coarse sands with an associated macroinvertebrate composition characteristic of nearshore sandy waters found in the northeastern Gulf of Mexico. In the littoral and swash zones, a relatively small number of opportunistic polychaetes and crustaceans dominate the benthic infaunal community structure. In the swash zone, fairly motile species are most abundant and include mole crabs (*Emerita talpoida*), an orbiniid polychaete (*Scololepis squamata*), and the surf clam (*Donax variabilis*). In the upper sublittoral zone, species abundance increases and is dominated

by small crustaceans. Overall, species richness, evenness, and diversity increase as depth increases in the littoral zone. However, the total infaunal abundance is highly variable and does not necessarily show a clear trend of increasing abundance with depth. Of the nearshore species of polychaetes, the most common are: *Dispio uncinata*, *Nephtys buccera*, *Scolelepis squamata*, *Paraonis fulgens*, and *Lumbrinereis* sp. Mollusk species include: *Chione grus*, *Lucina multilineata*, *Tellina versicolor* and *Polinices duplicatus*. Also characteristic of this sandy, high energy area are sand dollars (*Mellita quinquesperforata*) and several species of haustoriid amphipods including *Acanthohaustorius* spp. (Saloman and Tolbert 1965; Saloman 1976; Saloman and Naughton 1978). No hard substrates or reef areas with their associated fauna and submerged aquatic vegetation are known to exist within the St. Andrew Bay entrance channel or the nearshore littoral zone of the project area.

Due to the oceanic nature of St. Andrew Bay, the benthos of the entrance channel area of St. Andrew Bay is similar to that described in the previous section. Trawls within the channel alignment showed portunid crabs (*Portunus* spp.), squid (*Loliguncula brevis*), stomatopods (*Squilla empusa*), and penaeid shrimps to be abundant. (USACEWES 1995)

4.2 Factors affecting critical habitat within the action area

Of the four marine PCEs essential to the conservation of the species (abundant prey items for subadults and adults; sediment quality; water quality; and safe and unobstructed migratory pathways), only abundant prey items for subadults and adults within designated critical habitat Unit 11 may be adversely affected by the proposed project. Gulf sturgeon critical habitat Unit 11 is a spatially defined area that includes winter feeding habitat for sturgeon from the Yellow River, Choctawhatchee River, and Apalachicola River subpopulations. Numerous nationwide COE permits exist for wetland mitigation throughout unit 11. Furthermore, federal Essential Fish Habitat (EFH) consultation requirements pursuant to the Magnuson-Stevens Fishery Management and Conservation Act minimize and mitigate for losses of wetlands and preserve valuable Gulf sturgeon habitat.

4.2.1 Federal Actions

Federal agencies that consult on potential impacts to Gulf sturgeon critical habitat include the COE, the Department of Defense (DOD), the Environmental Protection Agency (EPA), the Federal Energy Regulatory Commission (FERC), and the Nuclear Regulatory Commission (NRC). Dredging and dredged material disposal and military activities, including training exercises and ordnance detonation, have the potential to impact designated critical habitat. In 2003, NMFS completed an RBO on hopper dredging in the Gulf of Mexico that includes maintenance dredging in Gulf sturgeon critical habitat units 8-14 and concluded that when channels within designated critical habitat are dredged to only their current depth, without improvements (i.e., deepening or widening), the project will not destroy or adversely modify Gulf sturgeon critical habitat. While numerous formal consultations have been conducted on potential impacts to the species, NMFS has conducted less than twenty formal consultations on potential impacts to Gulf sturgeon critical habitat since the effective date (April 18, 2003). USFWS has also conducted less than 20 formal consultations to ascertain potential project impacts on designated Gulf sturgeon critical habitat (J. Ziewitz, USFWS, pers. comm., February

5.1 Prey Abundance

Gulf sturgeon prey abundance in the project area and potential effects to it resulting from sediment modification were considered. Sediment modification effects were determined to be insignificant. In other opinions, NMFS has considered and analyzed the following factors to determine direct and indirect effects of projects impacting Gulf sturgeon prey abundance essential to the conservation of the Gulf sturgeon: Gulf sturgeon subpopulations using affected critical habitat, mean generation time, foraging method, prey items, benthic community structure, potential Gulf sturgeon prey in action area, and recovery of benthic biota. Whether individual factors are relevant to a particular action and analyzed within an opinion is highly site- and project-specific. NMFS determines and assesses relevant factors in order to predict the persistence and resilience of the prey resource with regard to density of both current and recovering Gulf sturgeon populations. That is, numerous variables depicting Gulf sturgeon prey are utilized to determine the likelihood of appropriate and abundant prey in the unit following the project to ensure that the action is not likely to result in the destruction or adverse modification of the PCE. Of the aforementioned factors, NMFS has determined that only the following are relevant to the proposed action and hence analyzed in this opinion to determine direct and indirect effects of the proposed action on the abundance of prey in Unit 11:

- (1) Gulf sturgeon subpopulations using affected critical habitat;
- (2) Mean generation time;
- (3) Prey items;
- (4) Benthic community structure;
- (5) Recovery of benthic biota; and
- (6) Potential Gulf sturgeon prey in action area.

5.1.1 Gulf sturgeon subpopulations using affected critical habitat

Overall, Gulf sturgeon critical habitat Unit 11 provides winter feeding and migration habitat for Gulf sturgeon from the Yellow River, Choctawhatchee River, and Apalachicola River subpopulations. Telemetry relocation data suggest that these subpopulations feed in nearshore Gulf of Mexico waters between their natal river systems (Fox et al. 2002; F. Parauka, pers. comm. 2002). Data suggest that Gulf sturgeon from the Yellow River, Choctawhatchee River, and Apalachicola River remain within 1.6 km (1 mi) of the coastline between these river systems (F. Parauka, pers. comm. 2002). Examination of bathymetry data along the Gulf of Mexico coastline between the Pensacola Bay and Apalachicola Bay reveals that depths of less than 6 m (19.7 ft) where Gulf sturgeon are generally found are all contained within 1 NM (1.9 km) from shore. Gulf nearshore substrate contains unconsolidated, fine-medium grain sands that support crustaceans such as mole crabs, sand fleas, various amphipod species, and lancelets (Menzel 1971; Abele and Kim 1986; and AFS 1989). Based on movement patterns, it appears Gulf sturgeon feed in the nearshore Gulf of Mexico en route to their natal rivers.

The actual number of Gulf sturgeon utilizing the project area for foraging is, at this time, likely few. Few data describing the population size and structure of Gulf sturgeon are available. Of the seven major rivers that are known to support Gulf sturgeon (Pearl, Pascagoula, Escambia/Conecuh, Yellow, Choctawhatchee, Apalachicola, and the Suwannee), population

estimates have been calculated for four (Table 1). NMFS believes that Gulf sturgeon population size within the other three major rivers is small. Relocation trawling during the original project resulted in the capture and release of eight Gulf sturgeon over the course of several months. Therefore, the number of Gulf sturgeon from the seven rivers (Pearl, Pascagoula, Escambia/Conecuh, Yellow, Choctawhatchee, Apalachicola, and Suwannee) that likely utilize the project area and that would be affected by an affected prey base is presumably few, but likely to increase as species recovery occurs.

Table 1. Summary of known Gulf sturgeon genetic subpopulations, reproducing riverine populations and the most recent estimated population size (N/A indicated data are not available)

Genetic subpopulations	Reproducing populations	Estimated population size
Lake Pontchartrain/Pearl River	Pearl River	292 ¹
Pascagoula River	Pascagoula River	N/A
Escambia/Yellow Rivers	Escambia/Conecuh Rivers	N/A
	Yellow River	319-1550 ²
Choctawhatchee River	Choctawhatchee River	N/A
Apalachicola/Ochlockonee/ Suwannee Rivers	Apalachicola River	62-218 ³
	Suwannee River	7650 ⁴

¹Based on fish greater than age three (Morrow et al. 1998)

²Includes only fish >100 cm TL (Berg 2004)

³Includes only fishes below the Jim Woodruff Lock and Dam (Zehfuss et al. 1999)

⁴Based on fish about 2 (>60 cm TL) or more years old (Sulak and Clugston 1999)

5.1.2 Mean generation time

Mean generation time (mean period elapsing between the birth of the parents and the birth of the offspring) is a useful tool to estimate the period of time for a population to increase in size.

While mean generation time is unknown for the Gulf sturgeon, it has been calculated for the shortnose sturgeon (*A. brevirostrum*), a congener, to be between 10 and 30 years (NMFS 1998). A self-sustaining Gulf sturgeon population has been defined as one where the average rate of natural recruitment is at least equal to the average mortality rate in a 12-year period; 12 years is the approximate age at maturity for a female Gulf sturgeon (USFWS et al. 1995). Mean generation time is evaluated respective to the proposed action as it provides an estimated time frame to expect an increase in population size. Given current measures to protect individuals, subpopulations, and habitat, NMFS is hopeful that the number of Gulf sturgeon will increase as many threats have been reduced with the protection afforded via section 7 of the ESA.

5.1.3 Prey items

Ontogenetic changes in Gulf sturgeon diet and foraging area have been documented. Young-of-the-year forage in freshwater on aquatic invertebrates and detritus (Mason and Clugston 1993; Sulak and Clugston 1999); juveniles forage throughout the river on aquatic insects (e.g., mayflies and caddis flies), worms (oligochaete), and bivalves (Huff 1975; Mason and Clugston 1993); adults forage sparingly in freshwater and depend almost entirely on estuarine and marine prey for

their growth (Gu et al. 2001). Both adult and subadult Gulf sturgeon are known to lose up to 30% of their total body weight while in freshwater, and subsequently compensate the loss during winter feeding in marine areas (Carr 1983; Wooley and Crateau 1985; Clugston et al. 1995; Morrow et al. 1998; Heise et al. 1999; Sulak and Clugston 1999; Ross et al. 2000). Therefore, once Gulf sturgeon leave the river after having spent at least six months in the river fasting, it is presumed that they immediately begin feeding. Upon exiting the rivers, Gulf sturgeon concentrate around the mouths of their natal rivers in lakes and bays. These areas are very important for the Gulf sturgeon as they offer the first foraging opportunity for the Gulf sturgeon exiting the rivers.

Few data have been collected on the food habits of Gulf sturgeon; their threatened status limits sampling efforts and gastric lavaging has only recently become successful. Gulf sturgeon have been described as opportunistic and indiscriminate benthivores; their guts generally contain benthic marine invertebrates including amphipods, lancelets, polychaetes, gastropods, shrimp, isopods, molluscs, and crustaceans (Huff 1975; Mason and Clugston 1993; Carr et al. 1996; Fox et al. 2000; Fox et al. 2002). During the early fall and winter, immediately following downstream migration, Gulf sturgeon are most often located in nearshore (depth less than 20 ft) sandy areas that support burrowing macroinvertebrates, where the fish are presumably foraging (Craft et al. 2001; Ross et al. 2001; Fox et al. 2002; Parauka et al. in press). Generally, Gulf sturgeon prey are burrowing species (e.g., annelids: polychaetes and oligochaetes, amphipods, isopods, and lancelets) that feed on detritus and/or suspended particles, and inhabit sandy substrate.

5.1.4 Benthic community structure

In most areas, community structure of the benthos is unknown. Without a comprehensive benthic survey, availability of Gulf sturgeon prey remains uncertain. Most of what is known about the community structure of sandy benthic communities of the northern Gulf of Mexico is the result of work by Saloman (1976), Saloman et al. (1982), Culter and Mahadevan (1982), and Rakocinski et al. (1991, 1993, 1996). While none of these reports describe the benthic community in or near the project area, the community structure described by Rakocinski et al. (1991, 1993, 1996) is likely similar to the project areas as both sites are comprised predominantly of sand.

Two areas will be impacted by this action: nearshore borrow areas and the swash zone. Community structure at the nearshore borrow areas, based on Rakocinski et al. (1991, 1993, 1996), is likely to be predominantly cumacean (*Cyclaspsis cf. varians*) and polychaete (*Streptosyllis pettiboneae* and *Nephtys buccera*). The mole crab (*Emerita talpoida*), spinoid polychaete (*Scoletelopsis squamata*), and wedge clam (*Donax variabilis*) likely dominate the swash zone, with some occurrence of polychaetes (*Dispio uncinata*, *Leitoscoloplos fragilis*, and *Paraonis gracilis*), haustoriid amphipods (*Haustorius jaynae*), isopods (*Ancinus depressus* and *Exosphaeroma diminutum*), and the mysid shrimp (*Metamysidopsis swiftii*).

5.1.5 Recovery of benthic biota

When similar sediments are deposited, many beach restoration studies document fairly rapid

macrobenthic recovery (i.e., <1 year) partly because resident nearshore assemblages are well adapted to disturbance from shifting sediments (Nelson 1989, 1993; Rakocinski et al. 1996). On the other hand, offshore (> 3 m depth) macrobenthic assemblages may take longer to recolonize following disturbance or burial because of their greater species diversity (Nelson 1993, Rakocinski et al. 1993). Negative impacts of beach renourishment usually occur when deposited sediments do not match local sediments in grain-size distributions or sediment composition (Rakocinski et al. 1996).

5.2 Potential Gulf sturgeon prey in the action area

Research in Choctawhatchee Bay (Fox and Hightower 1998; Fox et al. 2002; Parauka et al. in press) indicates that Gulf sturgeon show a preference for sandy shoreline habitats with the majority of fish being located in areas lacking seagrass. Craft et al. (2001) found that Gulf sturgeon in Pensacola Bay prefer shallow shoals with unvegetated, fine to medium grain sand habitats, such as sandbars and subtidal energy zones where sediment sorting occurs and there is a preponderance of sand supporting a variety of prey items. Other nearshore Gulf of Mexico locations where Gulf sturgeon are often located (via telemetry and tag returns) consist of unconsolidated, fine-medium grain sand habitats, including natural inlets and passes that are known to support Gulf sturgeon prey items (Menzel 1971; Abele and Kim 1986; AFS 1989). It has been concluded that Gulf sturgeon are foraging in these sandy areas where they are repeatedly located, as this habitat supports their prey (see preceding section "Prey items" for specifics).

5.3 Summary of effects on Gulf sturgeon critical habitat

Gulf sturgeon prey abundance has the ability to recover and recolonize, and therefore its resilience to the action should be considered. Recovery of the macrobenthic assemblages is expected to occur as sediment composition pre- and post-construction at the borrow areas and in the swash zone will be similar, and nearshore benthic assemblages are known to recover relatively quickly from physical disturbance. Conversion of subtidal habitat to emergent beach is expected to reverse over time as coastal erosion processes continue to erode the beach. Therefore, the loss is expected to be a temporary (1-5 years) alteration or conversion from one type of marine habitat to another.

While habitat known to support prey will be impacted, it is likely that any Gulf sturgeon in the project area will find appropriate and abundant prey in the areas adjacent to the project location as many other nearby sandy areas exist. Given that sturgeon forage opportunistically while benthic cruising, they can easily locate prey and fulfill nutritional requirements in areas adjacent to those impacted. Furthermore, limiting the placement of sand into the swash zone adjacent to the beach (not to exceed depth of 2 ft) reduces impacts to foraging Gulf sturgeon, as they are not likely to forage within this high-energy area.

Thus, the temporary reduction of benthic prey availability (<1 year) in the borrow areas and the beach placement areas is not expected to reduce the critical habitat's ability to support the Gulf sturgeon's conservation in the short or long term given current population estimates, the ability of the benthic community to recover, and the time period between the action and any increase in population size.

6 CUMULATIVE EFFECTS

ESA section 7 regulations require NMFS to consider cumulative effects in formulating their biological opinions (50 CFR 402.14). 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 opinion. Because many activities that affect marine habitat involve some degree of federal authorization (e.g., through MMS or COE), NMFS expects that ESA section 7 will apply to most future major actions that could affect designated Gulf sturgeon critical habitat Unit 11.

7 CONCLUSION

After reviewing the current status of the Gulf sturgeon's critical habitat in Unit 11, the environmental baseline, the effects of the proposed action, and the cumulative effects, it is NMFS' biological opinion that the effects on abundance of Gulf sturgeon prey items from removal of sand from borrow areas and placement of sand onto the beach and into the swash zone in the project area may temporarily adversely affect critical habitat but will not reduce its ability to support the Gulf sturgeon's conservation. NMFS concludes that the action, as proposed, is not likely to destroy or adversely modify designated Gulf sturgeon critical habitat.

8 INCIDENTAL TAKE STATEMENT

NMFS does not anticipate that the proposed action will incidentally take any species other than take authorized pursuant to the RBO and no additional take is authorized.

9 CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs federal agencies to utilize their authority to further the purposes of the ESA 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, to help implement

recovery plans, or to develop information. NMFS believes that MDCOE should implement the following conservation recommendations:

1. Gather data describing community structure of the benthos in and near the project area that would help to determine local Gulf sturgeon prey availability and thereby assist in future assessments of impacts to designated critical habitat.
2. Gather data describing recovery rates of benthic assemblages impacted by the nearshore sand removal and the deposition of material into the swash zone that would assist in future assessments of impacts to Gulf sturgeon prey items.

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

10 REINITIATION OF CONSULTATION

This concludes formal consultation on the removal of sand from nearshore borrow areas and the deposition of sand into the swash zone for the Panama City Beaches renourishment project. 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 taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion, or (4) a new species is listed or critical habitat designated that may be affected by the identified action.

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Godsey, Elizabeth S SAM

From: Lorna_Patrick@fws.gov
Sent: Wednesday, March 29, 2006 7:55 AM
To: Godsey, Elizabeth S SAM
Cc: lambruster@800pcbeach.com; Wendy_Gierhart@fws.gov; Melody_Ray-Culp@fws.gov
Subject: PCB Erosion Control and Storm Damage Prevention Project & CBRS

Panama City Beach Erosion Control and Storm Damage Prevention Project & CBRS, Bay County, FL

Elizabeth,
This is to confirm our conversation this week concerning the inclusion of the Pinnacle Port and Carillon areas within a unit of the Coastal Barrier System. The western portion of Pinnacle Port is with the Phillips Inlet Unit FL-93P of the CBRS. However, this unit is an "Otherwise Protected" area and the only restriction on the property concerns prohibition of federally subsidized flood insurance.

Lorna

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