



REPLY TO  
ATTENTION OF

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

**MAINTENANCE DREDGING  
PORT EVERGLADES  
BROWARD COUNTY, FLORIDA**

**FINDING OF NO SIGNIFICANT IMPACT**

The proposed project is the maintenance dredging of the Entrance Channel of Port Everglades, Broward County, Florida and placement of the dredged material on John U. Lloyd State Park. I have reviewed the Environmental Assessment (EA) of the proposed action. This Finding incorporates by reference all discussions and conclusions contained in the EA enclosed hereto. Based in the information analyzed in the EA, reflecting pertinent information obtained from other agencies and special interest groups having jurisdiction by law and/or special expertise, I conclude that the proposed action will have no significant impact on the quality of the human environment. Reasons for this conclusion are, in summary:

1. The work will be conducted in accordance with the Biological Opinion issued by the US Fish and Wildlife Service for impacts to manatees and nesting sea turtles, and the Regional Biological Opinion issued by the National Marine Fisheries Service for impacts to sea turtles in the water. The propose action does not jeopardize the continued existence of any threatened or endangered species or adversely impact any designated critical habitat.
2. In accordance with the Florida State Historic Preservation Officer, it was determined that the proposed dredging and beach placement will not impact any sites of cultural or historical significance.
3. The Florida Department of Environmental Protection has issued a Joint Coastal Permit for this project. The conditions contained within this permit will be addressed in the plans and specifications. Therefore, the state water standards will be met.
4. The proposed work has been determined to be consistent with the Florida Coastal Zone Management Program (CZMP).
5. Measures to eliminate, reduce, or avoid potential impacts to fish and wildlife resources will be implemented during project construction.
6. Benefits to the public will be the maintenance of the navigation channel, continued economic stimulus, increased recreational benefits and erosion protection from replacing lost beach area, and increased nesting habitat for sea turtles.

In consideration of the information summarized, I find that the proposed action will not significantly affect the human environment and does not require an Environmental Impact Statement.

5 JAN 04  
Date

Robert M Carpenter  
ROBERT M. CARPENTER  
Colonel, U.S. Army  
District Engineer

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**NOVEMBER 2003**

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**MAINTENANCE DREDGING**

**PORT EVERGLADES ENTRANCE CHANNEL  
BROWARD COUNTY, FLORIDA**

**ENVIRONMENTAL ASSESSMENT**



**U.S. Army Corps  
of Engineers**

Jacksonville District  
South Atlantic Division

**ENVIRONMENTAL ASSESSMENT  
ON  
MAINTENANCE DREDGING  
PORT EVERGLADES ENTRANCE CHANNEL  
BROWARD COUNTY, FLORIDA**

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**ENVIRONMENTAL ASSESSMENT  
ON  
MAINTENANCE DREDGING  
PORT EVERGLADES ENTRANCE CHANNEL  
BROWARD COUNTY, FLORIDA**

**1 PROJECT PURPOSE AND NEED**

**1.1 INTRODUCTION**

The U.S. Army Corps of Engineers (Corps), Jacksonville District, proposes to continue conducting routine maintenance dredging of the Port Everglades Entrance Channel, Broward County, Florida (see Figure 1, Plan View and Location Map). Approximately 100,000 cubic yards of sediment, resulting from shoaling, will be removed from the harbor's entrance channel. As part of its navigation mandate, the Corps conducts annual surveys of the Federal Navigation channel. During the 2002 survey, it was determined that sediment being transported around the north jetty is shoaling in the Entrance Channel and currently has encroached into 25% of the channel's width (Figure 2), thus increasing navigation difficulty and decreasing vessel safety while entering and leaving the Port. The Corps had originally planned to conduct this dredging as part of the planned Port Everglades expansion currently being studied by the Jacksonville district under the Port Everglades Feasibility Study. Due to study delays, the proposed expansion of the Port may not be initiated until 2005 or 2006. The Port pilots have noted a change in channel depths on the north side of the channel near the end of the jetty. Based on the 2002-channel survey conducted by the Jacksonville District, the shoal is 600 feet in length and approximately 120 feet in width. The channel is authorized to a depth of - 45ft + 2 additional feet of overdepth. The north side of the channel currently has a controlling depth of -24.6 ft mean lower low water.

The Corps approached Broward County to determine if they have an interest in utilizing the beach quality sediment as part of the Shore Protection Project (SPP) recently initiated by the county. The county has expressed an interest in utilizing the sediment in lieu of sediment that will be dredged from offshore borrow areas identified in the Draft Environmental Impact Statement for the Broward County Shore Protection Project completed in April, 2002. The Final EIS will be completed in late 2003 or early 2004. Utilization of this beach-quality sediment by the county will reduce the amount of sediment that must be dredged from offshore borrow areas, thus reducing the impacts to those borrow areas, and the surrounding coral reef environments. In the Broward County SPP DEIS, the Corps and County state that various types of dredging equipment, possibly including a hopper dredge, will be used to accomplish the above task of dredging from the offshore borrow sites. The Corps would also likely utilize a hopper dredge to remove the shoal material in the entrance channel. Excavated material consisting of suitable sand may be placed on the John U. Lloyd Beach State Park, part of segment III of the SPP. Dredging the entrance channel also serves the navigational needs of vessels utilizing Port Everglades. Should the county choose to utilize the sediments in the Entrance channel, the costs associated with the dredging will be incurred as part of the Shore Protection Project. If the County opts not to dredge the Entrance channel, the Corps will be initiating an Operations and Maintenance (O&M) event with Federal O&M funding.

## **1.2 PROJECT AUTHORITY**

Maintenance dredging of Port Everglades Entrance Channel was initially authorized under House Document 357/71/2 (July 1930), as well as subsequent authorizations associated with Port Expansion activities in 1935, 1938, 1946, 1958, 1974 and 1990. A Comprehensive list of these authorizations can be found at the District's Digital Project Notebook homepage ([http://www.saj.usace.army.mil/digitalproject/dpn/sajn\\_020.htm](http://www.saj.usace.army.mil/digitalproject/dpn/sajn_020.htm)).

## **1.3 DECISION TO BE MADE**

This Environmental Assessment will evaluate whether to have Broward County conduct the maintenance dredging and place the sediment on John U. Lloyd Beach State Park as part of the SPP, in lieu of the Corps dredging the entrance channel as an individual maintenance event.

## **1.4 RELEVANT ISSUES**

The following issues were identified as relevant to the proposed action and appropriate for detailed evaluation: (1) water quality degradation, especially in regards to turbidity and sediment contaminants; (2) impacts to endangered and threatened species occurring within the project area (i.e. manatees and sea turtles); (3) alteration of other wildlife resources; (4) potential damage to Essential Fish Habitat which may cause a reduction in standing stocks of certain managed species; (5) deleterious effects to benthos; (6) impacts to cultural resources; (7) beneficial or adverse effects to recreation; (8) impacts to navigation; (9) socio-economic effects to individuals, families, and businesses harmed by or benefiting by the project, especially in regards to commercial and recreational navigation; and (10) impacts to aesthetics.

## **1.5 NEPA DOCUMENTATION**

Pursuant to the National Environmental Policy Act (NEPA), this Environmental Assessment was prepared by the Corps in order to address all of the current Port Everglades entrance channel dredging and disposal alternatives. Maintenance dredging of the entrance channel was previously covered in two NEPA documents. Related environmental documents include the following:

USACE, 1990. Navigation Study for Port Everglades Harbor, Florida, 10207 Feasibility Report and Environmental Assessment. EA for deepening and widening of 8,000 feet of the SAC and creation of a 750-foot by 900-foot TN; and Port Everglades.

USACE, 1987. Final Environmental Impact Statement, Proposed Expansion Port Everglades, Broward County, Florida. EIS for deepening and widening the SAC, bulkheading Port land, creation of the Turn Notch.

Additionally, the Corps is currently preparing a Feasibility Study for Port Everglades.

Placement of sand on Broward County beaches for shore protection activities is covered in three previous NEPA documents:

USACE, 2002. Broward County Shore Protection Project, Segments II and III. Draft Environmental Impact Statement. April 2002.

USACE, 1998. Beach Erosion Control and Hurricane Protection Project, Dade County, Florida Modifications at Sunny Isles, Final Environmental Impact Statement, Jacksonville District.

USACE, 1996. Coast of Florida Erosion and Storm Effects Study, Region III: Feasibility Report with Draft Environmental Impact Statement.

## **1.6 PERMITS REQUIRED**

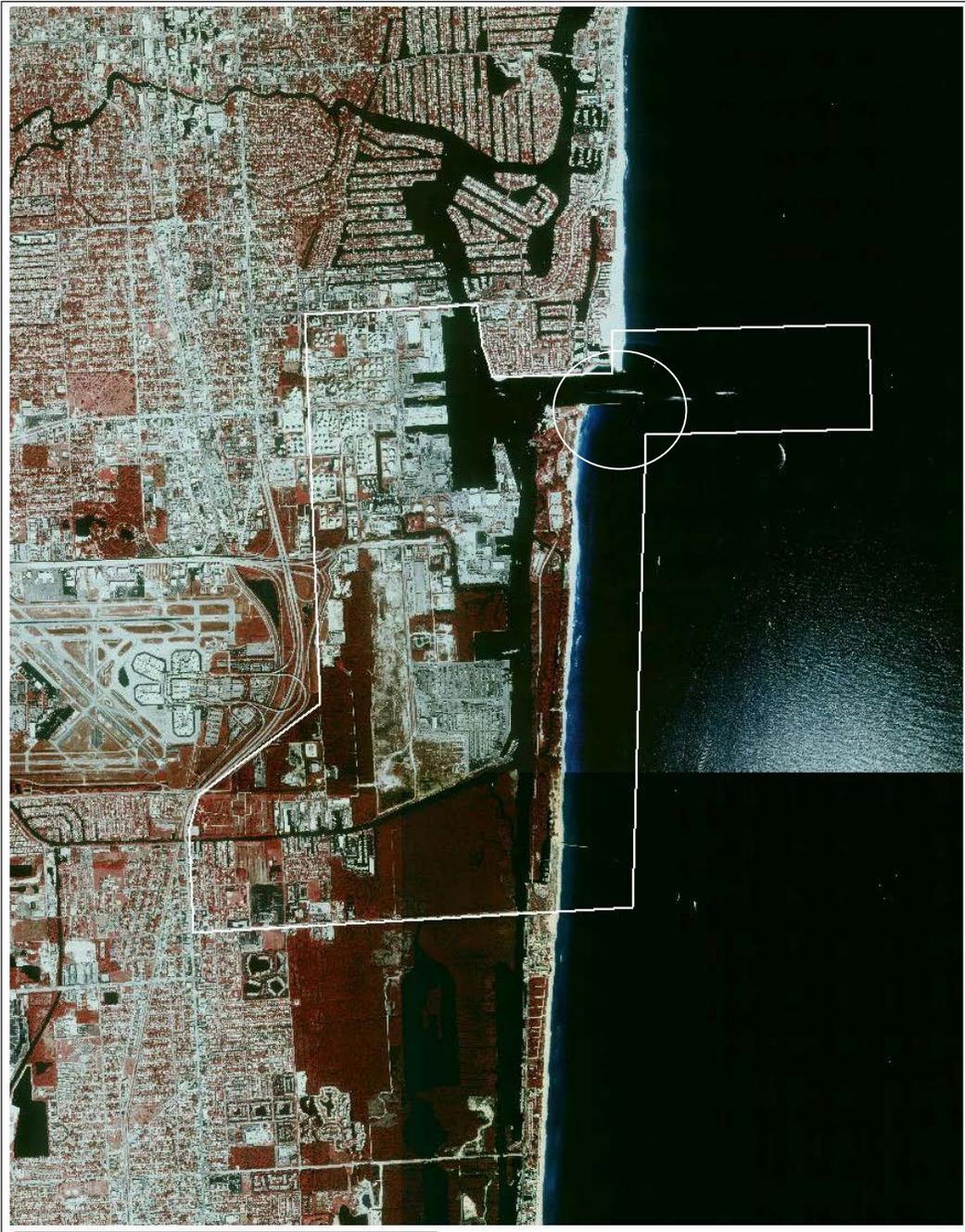
If the Corps performs the maintenance dredging operations, in accordance with Section 401 of the Clean Water Act of 1977, as amended, a Water Quality Certification will be required from the Florida Department of Environmental Protection (FDEP) for the proposed dredging activity. However, if the County performs the dredging operations in lieu of the Corps, they will either modify their existing Department of the Army Permit (# 199905545) and their State of Florida Consolidated Joint Coastal Permit and Intent to Grant Sovereign Submerged Lands Authorization #0163435-0010JC issued by the FLDEP on May 12, 2003 (Appendix C) or apply for new permits to allow for the use of the shoal material as part of the SPP.

## **1.7 METHODOLOGY**

This EA will compile information from two sources – the Broward County Shore Protection Project Draft Environmental Impact Statement (EIS) and the Draft Feasibility Study and EIS currently in preparation by the Corps addressing the impacts of expansion activities at Port Everglades. Both of these NEPA documents relied on an interdisciplinary team using a systematic approach to analyze the affected area, to estimate the probable environmental effects, and to prepare the EIS's. This included a literature search, coordination with agencies having expertise in certain areas, and on-site field investigations. This EA will compile information from the two projects since it combines aspects of both.

## **FIGURE 1: LOCATION MAP AND PLAN VIEW**

**Figure 1: Location Map and Plan View**





## **2 ALTERNATIVES**

### **2.1 INTRODUCTION**

The Alternatives Section is perhaps the most important component of this Environmental Assessment. It describes the no-action alternative, the proposed dredging alternatives, as well as the dredged material disposal options. The beneficial and adverse environmental effects of the alternatives are presented in comparative form, providing a clear basis for choice to the decision maker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Probable Impacts .

### **2.2 DESCRIPTION OF ALTERNATIVES**

#### **2.2.1 NO-ACTION ALTERNATIVE**

The Entrance Channel of Port Everglades would not be dredged by Broward County as a source of sediment for the Broward County Shore Protection Project. The Corps would dredge the Entrance Channel at a later date as a stand-alone maintenance-dredging project or the Corps would dredge it as part of the Port Everglades expansion project currently undergoing development.

#### **2.2.2 DREDGING ALTERNATIVE**

Approximately 100,000 cubic yards of beach quality material would be removed from the Federal navigation channel. Broward County, under their Shore Protection Project would dredge the shoal material from the entrance channel and place it on John U. Lloyd Beach State Park, in Segment III of the SPP in lieu of dredging 100,000 cubic yards of material from one of the four authorized borrow sites discussed in the DEIS.

### **2.3 PREFERRED ALTERNATIVE**

The preferred alternative is to have Broward County dredge the Port Everglades Entrance Channel as a sediment source for the Broward County Shore Protection Project, thus reducing the amount of material to be removed from the offshore borrow sites, and reducing the impacts to the corals adjacent to those sites.

### **2.4 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS**

Two other dredge material placement alternatives were eliminated from detailed analysis. 1) Placement of the shoaled sediments in an Offshore Dredged Material Disposal Site (ODMDS) – currently there is not a designated ODMDS for Port Everglades. 2) Upland Disposal – currently there is not an authorized upland disposal site for dredged material in Broward County.

### **2.5 COMPARISON OF ALTERNATIVES**

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. See Section 4.0, Environmental Effects, for a more detailed discussion of impacts of alternatives.

Table 1: Summary of Direct and Indirect Impacts

ALTERNATIVE	NO-ACTION ALTERNATIVE	DREDGING WITH BEACH PLACEMENT AT JUL
ENVIRONMENTAL FACTOR		
WATER QUALITY	No impact until Corps can initiate separate dredging project to clear shoal.	Short-term localized increase in turbidity at the dredge site and in the surf zone along the beach placement areas. Turbidity impacts are expected to be minimal since the source of the material is mostly the beachfront littoral system where the fines content is typically less than 2 percent.
MANATEES	No impact until Corps can initiate separate dredging project to clear shoal.	No impact with implementation of standard protection conditions.
SEA TURTLES	No impact until Corps can initiate separate dredging project to clear shoal.	Incidental take may occur if a hopper dredge is used. Minor short-term adverse impact on turtle nesting from placing the sand on the beach may occur. Increase in the overall available nesting habitat.
WHALES	No impact.	No adverse effects are anticipated.
WILDLIFE RESOURCES (OTHER THAN T&E SPECIES)	No impact until Corps can initiate separate dredging project to clear shoal.	Minor short-term disturbance.
ESSENTIAL FISH HABITAT	No impact until Corps can initiate separate dredging project to clear shoal.	Minor short-term disturbance.
BENTHOS	No impact until Corps can initiate separate dredging project to clear shoal.	Minor short-term disturbance.
CULTURAL RESOURCES	No impact until Corps can initiate separate dredging project to clear shoal.	No adverse effects are anticipated.

ALTERNATIVE ENVIRONMENTAL FACTOR	NO-ACTION ALTERNATIVE	DREDGING WITH BEACH PLACEMENT AT JUL
RECREATION	Moderate long-term impact to recreational boating from loss of navigable capacity of channel until Corps can initiate separate dredging project to clear shoal.	Moderate long-term benefit to recreational boating from maintaining the channel. Short-term impact to recreational boat traffic from construction vessel congestion. Increase in available beach for recreation.
NAVIGATION (COMMERCIAL & MILITARY)	Major long-term reduction in navigable capacity of channel until Corps can initiate separate dredging project to clear shoal.	Major long-term benefit from maintaining the channel. Short-term impact caused by construction vessel congestion.
ECONOMICS	Major long-term impact from loss of commercial port facilities and reduced recreational boating.	Major long-term benefit from maintaining commercial port facilities and recreational boating opportunities.
AESTHETICS	No impact until Corps can initiate separate dredging project to clear shoal.	No adverse impacts are anticipated.

### **3 AFFECTED ENVIRONMENT**

#### **3.1 INTRODUCTION**

The Affected Environment Section succinctly describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that would affect or that would be affected by the alternatives if they were implemented, not the entire existing environment. This section and the description of the "no-action" alternative provide the basic information for determining the environmental impacts of the proposed action and reasonable alternatives.

#### **3.2 GENERAL ENVIRONMENTAL SETTING**

##### **3.2.1 AREAS TO BE DREDGED**

The Port Everglades Harbor is a major seaport located on the southeast coast of Florida. It is located within the cities of Hollywood, Dania Beach and Fort Lauderdale, with immediate access to the Atlantic Ocean. The entrance of the Port is approximately 27 nautical miles north of Miami Harbor, Florida and 301 nautical miles south of Jacksonville Harbor, Florida. The existing Port Everglades Federal Navigation Project provides for an Outer Entrance Channel (OEC) that is 45 feet deep and 500 feet wide.

##### **3.2.2 BEACH PLACEMENT SITE – JOHN U. LLOYD BEACH STATE PARK**

East of the Port is John U. Lloyd State Park (JUL) which is dedicated for recreational use. The area is vegetated with mangroves and upland species, which include coastal hardwood hammocks, and exotics such as Australian pines and Brazilian peppers. JUL offers the visitors to its facilities many opportunities to enjoy themselves. These activities include swimming, picnicking, sunbathing, hiking, bicycle riding, fishing from the shoreline or the south fishing jetty, canoeing and boating. JUL is also in an area of high erosion rates. The Florida Department of Environmental Protection estimated that 80,000 cubic yards should be bypassing the inlet channel from north to south to maintain the beaches in JUL (Dean, 1987). The Entrance Channel is a complete littoral barrier, with all sand moving south being accreted on beaches north of the north jetty, or moving into the channel. The DEIS provides a detailed discussion of John U. Lloyd Beach State Park and the history of beach nourishment activities in Section 3.0 of the DEIS.

#### **3.3 WATER QUALITY**

##### **3.3.1 WATER USE CLASSIFICATION**

Waters within the proposed dredging area have been designated by the state of Florida as Class III Waters, suitable for recreation as well as propagation and maintenance of a healthy and well-balanced population of fish and wildlife. In addition to this

classification, the waters within JUL (Whiskey Creek) have also been designated by the state as Outstanding Florida Waters. According to the Florida Department of Environmental Protection, “the intent of an Outstanding Florida Water designation is to maintain ambient water quality, even if these designations are more protective than those required for the classification of the individual water body.”

### 3.3.2 WATER COLUMN ANALYSIS

Water which passes through the Port is conveyed via the New River System to the north, the Intracoastal Waterway to the south and the Dania Cutoff Canal, south of the Port which collects water from areas west of the Port. In addition, there are storm water collection systems both within the Port and in areas west and north of the Port which discharge into the Port. This water then flows out of the Entrance Channel on outgoing tides to the Atlantic Ocean.

Monitoring data indicate that water quality varies on a seasonal basis, and the physical parameters are influenced by freshwater run-off normally associated with the summer months.

Historical chemical analysis has indicated that some pesticides have been found in trace amounts. However, the Port does not handle fertilizers or pesticides as a bulk cargo and it is felt that the minor presence of these compounds may be associated with the urban run-off surrounding the Port.

No changes in salinity or flushing actions due to the increased channel opening from the removal of the shoal material are expected to occur. Additionally, no changes in water quality of receiving waters, estuarine habitats and species located west of the entrance channel shoal are expected to occur.

### 3.3.3 SEDIMENT ANALYSIS

The shoal material encountered in the area is mostly poorly graded carbonate sand with shell. It meets the criteria for beach placement as it contains less than 10% silt and clay materials (fines). In core boring CB-PEH03-2 a 2 foot thick shell bed was encountered at elevation -42.9 feet. This appears to be local, as it does not appear within the other nearby borings. Also, in the same boring some silty sand was encountered but it was below grade at elevation -49.9 feet. The drill logs for the core borings collected for in the shoal material are located in Appendix D.

## 3.4 THREATENED, ENDANGERED AND PROTECTED SPECIES

### 3.4.1 MANATEES

The West Indian manatee (*Trichechus manatus*) has been listed as a protected mammal in Florida since 1893. The manatee is also federally protected under the Marine Mammal Protection Act of 1972 and the ESA of 1973. The manatee was listed as an endangered species throughout its range in 1967 (32 FR 4061) and received

federal protection with the passage of the ESA in 1973. Critical habitat was designated in 1976 for the Florida subspecies (*Trichechus manatus latirostris*) (50 CFR 19.95(a)), there is no designated critical habitat in the project area. Florida provided further protection in 1978 by passing the Florida Marine Sanctuary Act designating the state as a manatee sanctuary and providing signage and speed zones in Florida's waterways.

Within Broward County there exists both a permanent and transient population of manatees. Surveys show that during the winter months when temperatures drop, manatees from north Florida and Miami-Dade County will migrate to the Florida Power and Light (FP&L) power plant at the Port (Deutsch 2000). During cold weather as many as 234 manatees have been recorded at the FP&L power plant at one time (Broward County 1992). During the summer months when the water warms, manatees return to the counties to the north and south to forage and reproduce, however, telemetry and aerial surveys confirm manatees are present within Broward County all year (Deutsch 2000 and Mezich 2001). Manatees reside and feed mainly in the estuarine areas and around inlets, and are only occasionally observed in the open ocean. No significant foraging habitat is known to exist in the areas around the project sites in Broward County (USACE, 2002), nor have West Indian manatees been known to congregate in the nearshore environments within Broward County (USACE, 1996).

### 3.4.2 SEA TURTLES

Broward County is within the normal nesting areas of three species of sea turtles: loggerhead sea turtle (*Caretta caretta*), green sea turtle (*Chelonia mydas*), and leatherback sea turtle (*Dermochelys coriacea*). Additionally, two of the seven hawksbill nests laid in the State of Florida between the years 1979 and 1998 were in Broward County: one nest in 1994, and one in 1997 (Florida Marine Research Institute, 1999). The loggerhead (*C. caretta*) is listed as a threatened species, while all other sea turtles are listed as endangered under the U.S. Endangered Species Act of 1973. The nesting season for all species of sea turtles, as defined by the Florida Fish and Wildlife Conservation Commission, is between March 1 and October 31 in Broward County.

#### 3.4.2.1 Nesting Habitat.

Overall, 2,073 nests were recorded in 2002 over the 24-mile beach from the Palm Beach County/Broward Line south to the Broward County/Dade County Line. Total nests recorded for the previous seven nesting seasons (2001, 2000, 1999, 1998, 1997, 1996, 1995) were 2,385; 2,942; 2,620; 2,857; 2,288; 2,810; and 2,634, respectively. The distribution of nests among species in 2002 was 2,070 loggerhead nests, 216 green sea turtle nests, and 18 leatherback nests. The distribution of nests among species during the 1998 season was 2,643 loggerhead nests, 200 green sea turtle nests, and 14 leatherback nests (Burney & Margolis, 1999). The distribution of nests among species during the 1997 season was 2,216 loggerhead nests, 29 green sea turtle nests, 42 leatherback nests, and one nest was confirmed as hawksbill (Burney & Margolis, 1998).

The Florida statewide nesting database provides the nesting results of Florida's surveyed beaches for the years 1979 through 2002. A total of 1,216,471 loggerhead nests (an average of 50,686 per nesting season); 42,241 green sea turtle nests (an average of 1,760 per nesting season); 5,160 leatherback nests (an average of 215 per nesting season); and 7 hawksbill nests were documented on Florida beaches between 1979 and 2002. Two of the seven hawksbill nests were laid in Broward County, one in 1994, and one in 1997 (Florida Marine Research Institute, 1999).

Due to the heavily developed nature of the Broward County coastline, the relative location of Highway A-1-A to the beach, and extensive beach front lighting, all of which have the potential to negatively impact nesting sea turtles and their hatchlings, Broward County has relocated all discovered nests at Pompano Beach, Deerfield Beach, Hollywood-Hallandale, and Fort Lauderdale since the inception of its sea turtle conservation program in 1978 (Burney and Margolis, 1998). In 1998, hatching success was at its lowest level since the nest relocation program was initiated. However, loggerhead-hatching success was slightly higher in relocated nests than *in situ* nests, lending credence to the hypothesis those environmental factors, such as the unusually high early summer temperatures in 1998, negatively affected early loggerhead nests (Sterghos, 1998).

### 3.4.3 DOLPHINS AND WHALES

Rare, threatened, or endangered whale species that are infrequent visitors to the coastal waters off Broward County during their migration patterns include the finback whale, *Balaenoptera physalus*; humpback whale, *Megaptera novaeangliae*, northern right whale, *Eubalaena glacialis*; sei whale, *Balaenoptera borealis*; and the sperm whale, *Physeter macrocephalus catodon* (USACE, 1996). A total of 21 stocks of marine mammals have been reported offshore of the project area (NMFS, 2002).

## 3.5 WILDLIFE RESOURCES OTHER THAN THREATENED, ENDANGERED AND PROTECTED SPECIES

### 3.5.1 BEACH AND DUNE HABITAT.

Very few birds utilize the beach and dunes in the project area due to intense coastal development. Several species of protected birds have been observed at JUL, including the Southeastern American Kestrel (*Falco sparverius paulus*), Eastern brown pelican (*Pelecanus occidentalis*), least tern (*Sterna antillarum*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tri-colored heron (*Egretta tricolor*), Roseate spoonbill (*Ajaia ajaja*), and osprey (*Pandion haliaetus carolinensis*) (Coastal Technology Corporation, 1994; Florida Game and Fresh Water Fish Commission, 1991).

Based upon database reports of the Florida Fish and Wildlife Conservation Commission, there are over 80 species of birds listed in the Federal Migratory Bird Treaty Act that have been recorded as inhabiting the southeast Florida coastline (Palm Beach, Broward, and Dade counties) between the surf zone and densely vegetated

forest of the back dune for at least part of the year (USACE, 1996). However, very few species utilize the beach and dune areas in this area due to intense coastal development. Sanderlings (*Calidris alba*) and ruddy turnstones (*Arenaria interpres*) are generally the only wintering species that are commonly observed foraging and resting on the beaches along Broward County. Royal terns (*Sterna maxima*), ring-billed gulls (*Larus delawarensis*), laughing gulls (*Larus atricilla*) and herring gulls (*Larus argentatus*) also winter along the southeast Florida coastline and are generally observed foraging and resting near fishing piers and on beaches adjacent to piers (USACE, 1996).

The beaches of Broward County are typical of southeast Florida beaches that receive the full impact of wind and wave action. The diversity of species that can survive in this environment is low, but the population density of the few resident species that are specialized to survive in this high-energy environment is usually very high. The upper portion of the beach, or subterrestrial fringe, is dominated by talitrid amphipods and ghost crab (*Ocypode quadrata*). In the midlittoral zone (beach face of the foreshore), polychaetes, isopods, and haustoriid amphipods are the dominant organisms. In the surf zone, coquina clams (*Donax* spp.) and mole crabs (*Emerita talpoida*) typically dominate the beach fauna (Spring, 1981; Nelson, 1985; and USFWS, 1997).

### 3.5.2 INLET COMMUNITIES.

The area of vegetated estuarine wetlands surrounding Port Everglades Inlet is also limited due to the extensive development of the Port and adjacent urban areas, absence of stable substrate, and excessive water depth

Corals (*Siderastrea* spp., *Porites* sp., *Montastrea* sp., *Oculina* sp., and *Leptogorgia setacea*) and sponges (*Cliona* sp. and *Spherospongia vesparium*) are sparsely distributed in some inlets in southeast Florida. Species commonly observed in association with jetty structures include fireworm (*Hermodice carunculata*), Cuban stone crab (*Menippe nodifrons*), flat crab (*Plagusia depressa*); sponges (*Haliclona* sp.), colonial anemone (*Zoanthus sociatus* and *Palythoa variabilis*), hydroids, and the octocoral, *Telesto riisei*. (CPE, 1992).

### 3.5.3 NEARSHORE SOFT BOTTOM COMMUNITIES.

Shallow subtidal soft bottom habitat (0 to 3 feet deep) are dominated by a relatively even mix of polychaetes (primarily spionids), gastropods (*Oliva* sp., *Terebra* sp.), portunid crabs (*Arenaeus* sp., *Callinectes* sp., and *Ovalipes* sp.) and burrowing shrimp (*Callinassa* sp.). In slightly deeper water (3 to 10 feet deep), the dominant fauna are polychaetes, haustoriid and other amphipod groups, and bivalves (*Donax*, sp. and *Tellina* sp.) (Marsh et al. 1980; Goldberg et al., 1985; Gorzelany and Nelson, 1987; Nelson, 1985; Dodge et al., 1991). Dexter (1972), Croker (1977), and Shelton and Robertson (1981) have indicated that there is no latitudinal pattern of diversity and species distribution among the tropical intertidal sand beach macrofauna (USACE, 1996).

### 3.5.4 FISHES.

#### 3.5.4.1 Nearshore community.

The inshore surf zone fish community consists mainly of small species or juveniles (Modde, 1980). A relatively few species typically dominate the surf zone area (Modde and Ross, 1981; Peters and Nelson, 1987). Common surf zone fish include Atlantic threadfin herring (*Opisthonema oglinum*); blue runner (*Caranx crysos*); spotfin mojarra (*Eucinostomus argenteus*); southern stingray (*Dasyatis americana*); greater barracuda (*Sphyræna barracuda*); yellow jack (*Caranx bartholomæi*) and the ocean triggerfish (*Canthidermis sufflamen*); none of which are of local commercial value (USACE, 1998).

A mixture of coastal pelagic, surf zone, and reef fishes are attracted to the shelter and food source provided by the nearshore hardbottom along southeast Florida (USACE, 1996). Coastal pelagic species observed are primarily migratory species that include Spanish mackerel, *Scomberomorus maculatus*; bluefish, *Pomatomus saltatrix*; mullets, *Mugil* spp.; and jacks, *Caranx* spp. Only Spanish mackerel and mullet are of commercial value (USACE, 1996). Typical surf zone fishes observed in association with the rock outcrops of southeast Florida include Atlantic croaker, *Micropogonias undulatus*; pompano, *Trachinotus carolinus*; jacks, *Caranx* spp.; snook, *Centropomus undecimalis*; anchovies, *Anchoa* spp.; and herrings, *Clupea* spp. (USACE, 1996). Common snook (*C. undecimalis*) is listed as a species of special concern by the State of Florida. These species are not confined to the nearshore hardbottom areas and can be found along the sandy periphery of the rocks in the nearshore zone (Herrema, 1974; Futch and Dwinnel, 1977; Gilmore, 1977; Gilmore et al., 1981). In contrast to surf zone fishes, reef fishes are always associated with some form of natural or artificial bottom structure. The offshore reefs support the largest populations of reef fish. Reef species often observed along the nearshore rock outcrops include grunts, snappers, groupers, wrasses, damselfish, blennies, gobies, angelfishes, and parrot fishes. Only snapper and grouper are of commercial value (USACE, 1996).

Detailed surveys of fish abundance and densities were conducted as part of the BCSSP and details of those surveys can be located in Section 3.5.5.1 and 3.5.5.2 of the DEIS.

### 3.6 ESSENTIAL FISH HABITAT

The SAFMC (1998) has designated nearshore hardbottom areas within the study area as EFH. The nearshore bottom of southeastern Florida has also been designated as EFH-HAPC (SAFMC 1998). Managed species that commonly inhabit the study area include pink shrimp (*Penaeus duorarum*), and spiny lobster (*Panularis argus*). These shellfish utilize both the inshore habitats within the study area. Members of the 73 species snapper-grouper complex that commonly use the inshore habitats for part of their life cycle include blue stripe grunts (*Haemulon sciurus*), French grunts (*Haemulon flavolineatum*), mahogany snapper (*Lutjanus mahogoni*), yellowtail snapper (*Ocyurus chysurus*), and red grouper (*Epinephelus morio*). These species utilize the inshore habitats as juveniles and sub-adults and as adults utilize the hardbottom and reef

communities offshore. In the offshore habitats, the number of species within the snapper-grouper complex that may be encountered increases. Other species of the snapper-grouper complex commonly seen offshore in the study area include gray triggerfish (*Balistes capriscus*) and hogfish (*Lachnolaimus maximus*). Coastal migratory pelagic species also commonly utilize the offshore area adjacent to the study area. In particular, the king mackerel (*Scomberomorus cavalla*) and the Spanish mackerel (*Scomberomorus maculatus*) are the most common. As many as 60 species of corals can occur off the coast of Florida (SAFMC 1998) and all of these fall under the protection of management plans.

### **3.7 CULTURAL RESOURCES**

In accordance with the recommendations of the State Historic Preservation Officer, the proposed dredging area was surveyed for underwater historical properties using a magnetometer for both the Broward County Shore protection project and the pending Port Everglades Feasibility Study. Both studies were granted concurrence from Florida State Historic Preservation Officer.

### **3.8 RECREATION**

Recreational boaters and divers use the Port Everglades Entrance channel primarily for accessing the offshore coral reefs and deep waters off of Broward County. Fishing, sailing and SCUBA diving these waters remains extremely popular. In addition to the commercial port facilities, there are several large marinas to the north and south of the Port. All of the beaches in the area support a wide variety of recreational activities such as surf fishing, swimming, and sun bathing.

### **3.9 NAVIGATION (COMMERCIAL & MILITARY)**

Port Everglades is the second largest port facility on Florida's Atlantic coast. More than 5,400 ships call at Port Everglades in a year forming the basis of a diverse maritime operation that includes a thriving cruise industry, containerized cargo, a major petroleum storage and distribution hub and South Florida's primary bulk cargo depot (Broward County, 2003).

Port Everglades has long been a favorite liberty port of call for U.S. Naval vessels. The port is a site for official ceremonies and a location for operational exercises in conjunction with the port-located U.S. Navy's South Florida Testing Facility. The port's deep harbor -- the only commercial port south of Norfolk, VA, that can handle aircraft carriers at its docks make it an ideal stop for vessels operating in Atlantic and Caribbean waters.

### **3.10 ECONOMICS**

Maintenance dredging of Port Everglades Entrance Channel is necessary to allow deep-draft vessels continued safe access to the port. The port, in turn, provides employment and also produces income for the local community through the purchase of goods and materials. Channel dredging maintains safe navigation conditions for commercial fishermen, commercial dive boat operators and recreational boating enthusiasts as well.

Boating opportunities and maintained beaches offer the local tourism industry attractions for generating revenue.

### **3.11 AESTHETICS**

Beach State Park is enjoyed by thousands of visitors every year, and commercial and recreational fisherman and divers to access the offshore coral reefs utilize the Entrance Channel.

## **4 ENVIRONMENTAL EFFECTS**

### **4.1 INTRODUCTION**

This section describes how the implementation of each alternative would affect the environmental resources listed in Section 1.4. A summary of these impacts can be found in Table 1 of Section 2.0. The following anticipated changes to the existing environment include direct, indirect, and cumulative effects.

### **4.2 WATER QUALITY**

#### **4.2.1 NO-ACTION ALTERNATIVE**

There will be no impact to water quality if Broward County does not dredge the Entrance Channel. There may be impacts to water quality when the Corps dredges the Entrance Channel as either a separate project or part of the Feasibility Study. A separate NEPA document will be prepared for that action and that document will evaluate the effects of the Corps actions.

#### **4.2.2 DREDGING ALTERNATIVE**

The only anticipated change in water quality at the proposed dredge site will be a temporary increase in turbidity. According to the state of Florida's water quality standards, turbidity levels during dredging are not to exceed 29 nephelometric turbidity units (NTUs) above background levels within a 150-meter mixing zone. In order to comply with this standard, turbidity will be monitored according to state protocols during the proposed dredge work. If at any time the turbidity standard is exceeded, those activities causing the violation will cease. A permit issued by the Florida DEP includes the requirements for water quality during dredging activities (Appendix C).

### **4.3 THREATENED, ENDANGERED AND PROTECTED SPECIES**

#### **4.3.1 NO-ACTION ALTERNATIVE**

There will be no impact to threatened and endangered species if Broward County does not dredge the Entrance Channel. There may be impacts to threatened and endangered species when the Corps dredges the Entrance Channel as either a separate project or part of the Feasibility Study. A separate NEPA document will be prepared for that action and that document will evaluate the effects of the Corps actions.

#### 4.3.2 DREDGING ALTERNATIVE

Coordination with the U.S. Fish and Wildlife Service (USFWS) was conducted regarding possible impacts to the manatee and sea turtles caused by the proposed project (see Appendix C). The USFWS stated that the project is not likely to adversely affect the manatee if the precautions listed below are implemented, whereas the project may affect the loggerhead, leatherback and green sea turtles. Precautions regarding nesting sea turtles, as listed in the biological opinion of the USFWS, will be implemented. Coordination with the National Marine Fisheries Service (NMFS) was conducted via the public notice. All standard precautions for hopper dredge use, as stated in the regional biological opinion of the NMFS, will be incorporated in the project plans and specifications should one be utilized.

##### 4.3.2.1 Manatees

The following standard protection measures will be implemented to minimize potential impacts to manatees:

- (1) The contractor will instruct all personnel associated with the construction of the project about the presence of manatees in the area and the need to avoid collisions with manatees. All construction personnel shall be responsible for observing water-related activities for the presence of manatees and shall implement appropriate precautions to ensure the protection of manatees.
- (2) All construction personnel shall be advised that there are civil and criminal penalties for harming, harassing or killing manatees, which are protected under the Marine Mammals Protection Act of 1972, the Endangered Species Act of 1973, and the Florida Sanctuary Act. The contractor shall be held responsible for any manatee harmed, harassed, or killed as a result of the construction of the project.
- (3) Prior to the commencement of construction, the construction contractor shall construct and install at least two temporary signs concerning manatees. These signs shall read "Caution: Manatee Habitat. Idle Speed is required if operating a Vessel in the Construction Area" and "Caution: Manatee Habitat. Equipment must be Shutdown Immediately if a Manatee Comes Within 50 Feet of Operation".
- (4) All vessels associated with the project will be required to operate at "no wake" speeds at all times while in waters where the draft of the vessel provides less than four feet of clearance from the bottom. All vessels shall follow routes of deep water whenever possible.
- (5) If a manatee is sighted within a hundred yards of the construction area, appropriate safeguards will be taken, including suspension of construction activities, if necessary, to avoid injury to manatees. These precautions

shall include the operation of all moving equipment no closer than 50 feet of a manatee.

- (6) The contractor shall maintain a log detailing sightings, collisions, or injuries to manatees should they occur during the contract. Any collision with and/or injury to a manatee shall be reported immediately to the Florida Marine Patrol at 1-800-DIAL-FMP (1-800-342-5367) and U.S. Fish and Wildlife Service in Vero Beach.

#### 4.3.2.2 Sea turtles

Considering that a hopper dredge will be utilized to clear the shoal in the Port Everglades Entrance Channel, compliance with all recommendations and requirements of the 1997 NMFS Biological Opinion regarding hopper dredging will be required to assure that incidental take of sea turtles are minimized during hopper dredging operations (Appendix C). The sea turtle deflecting draghead is required for all hopper-dredging projects during the months that turtles may be present, unless a waiver is granted by the USACE in consultation with NMFS. The 1997 amended Biological Opinion mandates that year round, one-hundred percent observer coverage is necessary for beach nourishment project in southeast Florida. One hundred percent inflow screening is required, and one-hundred percent overflow screening is recommended when observers are required on hopper dredges. If conditions prevent one hundred percent inflow screening, inflow screening can be reduced, but one hundred percent outflow screening is required, and an explanation must be included in the preliminary dredging report. Preliminary dredging reports which summarize the results of the dredging and any sea turtle take must be submitted within 30 working days of completion of any given dredging project. Logs of any sea turtle injuries or deaths due to hopper dredging activities will be maintained, with immediate notification to the USACE, Jacksonville District, the USFWS and NMFS as appropriate, and the FFWCC.

The Corps and Broward County agree to comply with the reasonable and prudent measures and non-discretionary terms and conditions stated in the U.S. Fish and Wildlife Biological Opinion for the proposed Broward County Shore Protection Project (dated March 11, 2002 – copy provided in Appendix C). The reasonable and prudent measures and terms and conditions as stated in the Biological Opinion will be implemented to minimize take of the loggerhead, leatherback, and green sea turtle.

#### 4.3.2.3 Dolphins and Whales

The proposed project is not expected to have any effect on dolphins and whales that inhabit the waters offshore of Broward County.

## 4.4 WILDLIFE RESOURCES OTHER THAN THREATENED, ENDANGERED AND PROTECTED SPECIES

### 4.4.1 NO-ACTION ALTERNATIVE

There will be no impact to wildlife resources other than threatened, endangered and protected species if Broward County does not dredge the Entrance Channel. There may be impacts to wildlife resources other than threatened, endangered and protected species when the Corps dredges the Entrance Channel as either a separate project or part of the Feasibility Study. A separate NEPA document will be prepared for that action and that document will evaluate the effects of the Corps actions.

### 4.4.2 DREDGING ALTERNATIVE

Placement of dredged sand at the designated beach placement sites will have a temporary impact on aquatic and shore life. Species of birds that use these beaches for resting or feeding will be temporarily displaced but should quickly return once the work is terminated. Nearshore free-swimming organisms will also avoid the construction zone and should eventually recolonize the area. Turbidity levels along the placement site will temporarily increase, but will return to normal after beach equilibrium is achieved. Because the beach placement areas occur within a surf zone, naturally occurring turbidity levels are high. Organisms inhabiting this zone will be impacted by run-off from the disposal area but are adapted for survival in such conditions. Thus, impacts will be minor. Any losses due to the project should be replaced within a short time.

#### 4.4.2.1 Beach and Dune habitat.

Very few birds utilize the beach and dunes in the project area due to intense coastal development. Several species of protected birds have been observed at JUL, including the Southeastern American Kestrel (*Falco sparverius paulus*), Eastern brown pelican (*Pelecanus occidentalis*), least tern (*Sterna antillarum*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tri-colored heron (*Egretta tricolor*), Roseate spoonbill (*Ajaia ajaja*), and osprey (*Pandion haliaetus carolinensis*) (Coastal Technology Corporation, 1994; Florida Game and Fresh Water Fish Commission, 1991).

Based upon database reports of the Florida Fish and Wildlife Conservation Commission, there are over 80 species of birds listed in the Federal Migratory Bird Treaty Act that have been recorded as inhabiting the southeast Florida coastline (Palm Beach, Broward, and Dade counties) between the surf zone and densely vegetated forest of the back dune for at least part of the year (USACE, 1996). However, very few species utilize the beach and dune areas in this area due to intense coastal development. Sanderlings (*Calidris alba*) and ruddy turnstones (*Arenaria interpres*) are generally the only wintering species that are commonly observed foraging and resting on the beaches along Broward County. Royal terns (*Sterna maxima*), ring-billed gulls (*Larus delawarensis*), laughing gulls (*Larus atricilla*) and herring gulls (*Larus argentatus*) also winter along the southeast Florida coastline and are generally observed foraging and resting near fishing piers and on beaches adjacent to piers (USACE, 1996).

The beaches of Broward County are typical of southeast Florida beaches that receive the full impact of wind and wave action. The diversity of species that can survive in this environment is low, but the population density of the few resident species that are specialized to survive in this high-energy environment is usually very high. Talitrid amphipods and ghost crab (*Ocypode quadrata*) dominate the upper portion of the beach, or subterrestrial fringe. In the midlittoral zone (beach face of the foreshore), polychaetes, isopods, and haustoriid amphipods are the dominant organisms. In the surf zone, coquina clams (*Donax* spp.) and mole crabs (*Emerita talpoida*) typically dominate the beach fauna (Spring, 1981; Nelson, 1985; and USFWS, 1997).

#### 4.4.2.2 Inlet Communities.

The area of vegetated estuarine wetlands surrounding Port Everglades Inlet is also limited due to the extensive development of the Port and adjacent urban areas, absence of stable substrate, and excessive water depth

Corals (*Siderastrea* spp., *Porites* sp., *Montastrea* sp., *Oculina* sp., and *Leptogorgia setacea*) and sponges (*Cliona* sp. and *Sphaciospongia vesparium*) are sparsely distributed in some inlets in southeast Florida. Species commonly observed in association with jetty structures include fireworm (*Hermodice carunculata*), Cuban stone crab (*Menippe nodifrons*), flat crab (*Plagusia depressa*); sponges (*Haliclona* sp.), colonial anemone (*Zoanthus sociatus* and *Palythoa variabilis*), hydroids, and the octocoral, *Telesto riisei*. (CPE, 1992).

#### 4.4.2.3 Nearshore Soft Bottom Communities.

Shallow subtidal soft bottom habitat (0 to 3 feet deep) are dominated by a relatively even mix of polychaetes (primarily spionids), gastropods (*Oliva* sp., *Terebra* sp.), portunid crabs (*Arenaeus* sp., *Callinectes* sp., and *Ovalipes* sp.) and burrowing shrimp (*Callinassa* sp.). In slightly deeper water (3 to 10 feet deep), the dominant fauna are polychaetes, haustoriid and other amphipod groups, and bivalves (*Donax*, sp. and *Tellina* sp.) (Marsh et al. 1980; Goldberg et al., 1985; Gorzelany and Nelson, 1987; Nelson, 1985; Dodge et al., 1991). Dexter (1972), Croker (1977), and Shelton and Robertson (1981) have indicated that there is no latitudinal pattern of diversity and species distribution among the tropical intertidal sand beach macrofauna (USACE, 1996).

### 4.4.3 FISHES.

#### 4.4.3.1 Nearshore Community.

The inshore surf zone fish community consists mainly of small species or juveniles (Modde, 1980). A relatively few species typically dominate the surf zone area (Modde and Ross, 1981; Peters and Nelson, 1987). Common surf zone fish include Atlantic threadfin herring (*Opisthonema oglinum*); blue runner (*Caranx crysos*); spotfin mojarra (*Eucinostomus argenteus*); southern stingray (*Dasyatis americana*); greater barracuda

(*Sphyraena barracuda*); yellow jack (*Caranx bartholomaei*) and the ocean triggerfish (*Canthidermis sufflamen*); none of which are of local commercial value (USACE, 1998).

A mixture of coastal pelagic, surf zone, and reef fishes are attracted to the shelter and food source provided by the nearshore hardbottom along southeast Florida (USACE, 1996). Coastal pelagic species observed are primarily migratory species that include Spanish mackerel, *Scomberomorus maculatus*; bluefish, *Pomatomus saltatrix*; mullets, *Mugil* spp.; and jacks, *Caranx* spp. Only Spanish mackerel and mullet are of commercial value (USACE, 1996). Typical surf zone fishes observed in association with the rock outcrops of southeast Florida include Atlantic croaker, *Micropogonias undulatus*; pompano, *Trachinotus carolinus*; jacks, *Caranx* spp.; snook, *Centropomus undecimalis*; anchovies, *Anchoa* spp.; and herrings, *Clupea* spp. (USACE, 1996). Common snook (*C. undecimalis*) is listed as a species of special concern by the State of Florida. These species are not confined to the nearshore hardbottom areas and can be found along the sandy periphery of the rocks in the nearshore zone (Herrema, 1974; Futch and Dwinnel, 1977; Gilmore, 1977; Gilmore et al., 1981). In contrast to surf zone fishes, reef fishes are always associated with some form of natural or artificial bottom structure. The offshore reefs support the largest populations of reef fish. Reef species often observed along the nearshore rock outcrops include grunts, snappers, groupers, wrasses, damselfish, blennies, gobies, angelfishes, and parrot fishes. Only snapper and grouper are of commercial value (USACE, 1996).

Detailed surveys of fish abundance and densities were conducted as part of the BCSSP and details of those surveys can be located in Section 3.5.5.1 and 3.5.5.2 of the DEIS.

## **4.5 ESSENTIAL FISH HABITAT**

### **4.5.1 NO-ACTION ALTERNATIVE**

There will be no impact to Essential Fish Habitat if Broward County does not dredge the Entrance Channel. There may be impacts to Essential Fish Habitat when the Corps dredges the Entrance Channel as either a separate project or part of the Feasibility Study. A separate NEPA document will be prepared for that action and that document will evaluate the effects of the Corps actions.

### **4.5.2 DREDGING ALTERNATIVE**

All coastal inlets, such as the Port Everglades entrance channel, are considered by the South Atlantic Fishery Management Council to be habitat areas of particular concern for some commercially important species. A detailed analysis of the effects to Essential Fish Habitat as a result of placing sediment on the beach at JUL has been analyzed in the Broward County SPP DEIS (Section 4.6).

Removal of the shoal material from the entrance channel will temporarily affect EFH in the channel. The most obvious direct of this alternative on managed species is the potential for mortality and/or injury of individuals through the dredging process. Species in the project area's habitats are susceptible. Fishes and invertebrates are at risk at any

life-history stage; eggs, larvae, juveniles, and even adults may be inadvertently killed, disabled, or undergo physiological stress, which may adversely affect behavior or health. Forms that are less motile, such as juvenile shrimp, are particularly vulnerable. However, historic dredging episodes have shown that these species recolonize fairly quickly; so much of the impact would be temporary.

Impacts to the water column can have widespread effects on marine and estuarine species. Hence, it is recognized as EFH. The water column is a habitat used for foraging, spawning, and migration by both managed species and organisms consumed by managed species. Water quality concerns are of particular importance in the maintenance of this important habitat.

Temporary impacts to populations of managed species would occur due to dredging softbottom habitats, such as this sandy bottom area. Dredging would remove benthic organisms used as prey by managed species and temporarily lower the carrying capacity of the project area for certain species, such as red drum, that largely forage on such taxa.

## **4.6 CULTURAL RESOURCES**

### **4.6.1 NO-ACTION ALTERNATIVE**

There will be no impact to cultural resources if Broward County does not dredge the Entrance Channel.

### **4.6.2 DREDGING ALTERNATIVE**

An underwater cultural resource survey has been conducted for the project area. No historic properties were located as a part of this study. Based on this study a determination of no historic properties was made. The Florida State Historic Preservation Officer concurred with this determination (Division of Historic Resources #2002-09147, Appendix C).

## **4.7 RECREATION**

### **4.7.1 NO-ACTION ALTERNATIVE**

Recreational boating, and access to offshore fishing and SCUBA diving would be impacted if the Port Everglades Entrance Channel were not dredged by Broward County because of increased shoaling and decreased navigable capacity of the project channel. This increased shoaling will restrict recreational vessel access when larger commercial or military vessels are in the channel, since the larger vessels will have even more limited maneuverability and channel width to use while entering and exiting the port.

### **4.7.2 DREDGING ALTERNATIVE**

Recreational boat traffic would experience temporary delays due to construction traffic and congestion. Minor temporary impacts would also occur to recreational beach

activities because of sand placement construction activities. However, recreational boat traffic would benefit from the increased navigable capacity of the channel. Recreational beach activities would benefit from the increased beach area resulting from the dredging and beach placement.

Section 4.10 of the Broward County SPP DEIS presents a detailed analysis of placing sandy beach quality sediment on the JUL beaches.

## **4.8 NAVIGATION (COMMERCIAL AND MILITARY)**

### **4.8.1 NO-ACTION ALTERNATIVE**

Sediment would continue to accumulate in the entrance channel south of the north jetty due to littoral drift until the Corps could complete the necessary planning and coordination necessary to initiate the project. Sediment accumulation would continue to hamper vessel navigation through the entrance channel, continuing to effect vessel safety. The channel is currently restricted to one-way vessel traffic and during periods of high traffic or inclement weather it is imperative that vessels have full latitude within the channel to make necessary emergency maneuvers and course corrections. Due to budgetary constraints, it may take as long as two-years for the Corps to be prepared to begin maintenance dredging operations in the channel.

### **4.8.2 DREDGING ALTERNATIVE**

Dredging will maintain the full two-way navigable capacity of the project channel for deep-draft vessels.

## **4.9 ECONOMICS**

### **4.9.1 NO-ACTION ALTERNATIVE**

Sediment accumulation in the entrance channel hampers vessel navigation and increases transportation costs in two ways: first, vessel groundings would become more likely and frequent, resulting in additional costs for not only the grounded vessels, but also those vessels delayed by the obstruction; and second, deeply-laden vessels would incur delay costs awaiting tide for the necessary additional channel depth to enter/depart Port Everglades. The increased transportation costs are factored into businesses' decisions to locate or expand operations, reducing the competitive advantage offered by Port Everglades.

### **4.9.2 DREDGING ALTERNATIVE**

Maintenance dredging of the project channel will allow full access to Port Everglades. Transportation of commodities through the port creates a stimulus for attracting new business to the area. Recreational boaters as well as commercial fishing and diving enterprises also rely on the navigable capacity of the project channel for access purposes. Additionally, the port provides jobs and generates revenue for the surrounding community through the purchase of goods and materials. Maintained beaches provide attractions that generate revenue for the local tourist industry.

## **4.10 AESTHETICS**

### **4.10.1 NO-ACTION ALTERNATIVE**

There will be no impact to aesthetics if Broward County does not dredge the Entrance Channel. There may be impacts to aesthetics when the Corps dredges the Entrance Channel as either a separate project or part of the Feasibility Study. A separate NEPA document will be prepared for that action and that document will evaluate the effects of the Corps actions.

### **4.10.2 DREDGING ALTERNATIVE**

Construction activities within the project channel and at the disposal sites would temporarily impact the aesthetic appeal of the area. Permanent impacts to the aesthetics of the area caused by the construction are not anticipated.

## **4.11 CUMULATIVE IMPACTS**

Cumulative impact is the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions (40 CFR 1508.7).

Port Everglades was authorized as a Federal project in 1930 (see section 1.2 for more detail on the history of authorization of the project and subsequent improvements). The port has undergone numerous maintenance events and various navigation improvements. We fully expect the port to remain viable for many years and to continue undergoing maintenance and navigation improvements. An EIS addressing proposed navigation improvements is underway. The Notice of Intent to prepare the Draft EIS appeared in the Federal Register on March 23, 2001. Cumulative impacts relative to placing sand on the Broward County shoreline have been addressed in earlier and current EISs (see EIS on the Coast of Florida Study, Region III (October 1996) and the Broward County Shore Protection Project (March 2001, draft)). Information on these and other NEPA documents can be viewed on the Internet at

<http://www.saj.usace.army.mil/pd/envdocs/envdocsb.htm>. Maintenance dredging is an ordinary and reoccurring event for the port. The proposed maintenance dredging is not expected to represent a substantial increment of cumulative impact to the area.

## **4.12 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

### **4.12.1 IRREVERSIBLE**

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. The only irreversible commitment of resources associated with the proposed project would be the expenditure of federal funds to complete the work.

#### 4.12.2 IRRETRIEVABLE

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. Placement of dredged sand at the beach disposal sites would temporarily disrupt the normal use of these areas.

#### 4.13 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

There may be short-term degradation of water quality due to turbidity caused by dredging and dredged material disposal operations. The potential exists for the incidental taking of sea turtles during dredging operations. However, the implementation of standard protective measures should minimize and mitigate for this potential.

#### 4.14 ENVIRONMENTAL COMMITMENTS

The U.S. Army Corps of Engineers and Broward County are committed to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications.

The Broward County SPP DEIS has a complete list of all of the environmental commitments the Corps and County have made that will be applied to this project. A discussion of these commitments is located in the SPP DEIS in section 4.34.

The Corps and Broward County will comply with all requirements of the 1997 NMFS Regional Biological Opinion for the Continued Hopper Dredging of Channels and Borrow Areas in the Southeastern United States dated September 25, 1997.

Additional actions will be taken in order to comply with the following environmental requirements.

#### 4.15 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

##### 4.15.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project has been compiled and this Environmental Assessment has been prepared. It is available to any interested parties. The project is in compliance with the National Environmental Policy Act.

##### 4.15.2 ENDANGERED SPECIES ACT OF 1973

Consultation was initiated with the US Fish and Wildlife Service on February 3, 2000, and completed on March 11, 2002 (see Appendix C). Dredging operations have also been coordinated with the National Marine Fisheries Service (NMFS) by letter dated February 28, 2000, NMFS responded by letter dated March 10, 2000 referring the Corps to utilize the Regional Biological Opinion for hopper dredging within the southeastern United States (September 29, 1997). All special conditions pertaining to the use of a hopper dredge will be implemented should one be used. This project was

fully coordinated under the Endangered Species Act and is therefore, in full compliance with the Act.

#### 4.15.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project has been coordinated with the U.S. Fish and Wildlife Service (USFWS). A Coordination Act Report was not required for this project. A Coordination Act Report was prepared for the Shore Protection Project as well as the Port Everglades Feasibility Study. This project is in full compliance with the Act.

#### 4.15.4 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, channel surveys, and consultation with the Florida State Historic Preservation Officer (SHPO), have been conducted for the shore protection project and the proposed Port Everglades Feasibility Study in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. The project is in full compliance with the Act.

#### 4.15.5 CLEAN WATER ACT OF 1972

A Section 401 water quality certification will be required from the Florida Department of Environmental Protection. All state water quality standards would be met. A Section 404(b) evaluation is included in this report as Appendix A. Public notices (Department of the Army and State of Florida Department of Environmental Protection) were issued in a manner, which satisfies the requirements of Section 404 of the Clean Water Act.

#### 4.15.6 CLEAN AIR ACT OF 1972

No air quality permits would be required for this project.

#### 4.15.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix B. The Corps has determined that the project would have no unacceptable impacts and would be consistent with the Florida Coastal Management Plan. In accordance with the Memorandum of Understanding (1979) and the Addendum to the Memorandum (1983) concerning acquisition of Water Quality Certifications and other state authorizations, the preliminary Environmental Assessment and Section 404 (b)(1) Evaluation have been submitted to the state in lieu of a summary of environmental impacts to show consistency with the Florida Coastal Zone Management Plan. Final state concurrence will be received with the issuance of the Water Quality Certification.

#### 4.15.8 FARMLAND PROTECTION POLICY ACT OF 1981

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

#### 4.15.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic River reaches would be affected by project related activities. This Act is not applicable.

#### 4.15.10 MARINE MAMMAL PROTECTION ACT OF 1972

The Corps does not anticipate the take of any marine mammals during any activities associated with the project. However, should a marine mammal be identified within the project boundaries, they will be provided protections equal the ESA species that have had consultations completed, and as a result of this, the Corps believes that they are in compliance with the MMPA.

#### 4.15.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. This Act is not applicable.

#### 4.15.12 FEDERAL WATER PROJECT RECREATION ACT

There is no recreational development proposed for maintenance dredging or disposal. Therefore, this Act does not apply.

#### 4.15.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

Coordination with the National Marine Fisheries Service (NMFS) has been accomplished during review of the Broward County SPP DEIS. The project will be in compliance with this Act.

#### 4.15.14 SUBMERGED LANDS ACT OF 1953

The project will occur on submerged lands of the State of Florida. The project has been coordinated with the State and will be in compliance with the act. The FDEP released a notice of intent to issue for Segment III on October 17, 2002, and issued a joint coastal permit and intent to grant sovereign submerged lands authorization on May 13, 2003.

#### 4.15.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

John U Lloyd State Park is listed as undeveloped coastal barriers as defined by the Coastal Barriers Resources Act. These parcels require coordination with the U.S. Fish and Wildlife Service prior to nourishment activities. The Corps completed this coordination on April 30, 2002 as part of the EIS process for the Shore protection project.

#### 4.15.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action has been subject to the public notice, public hearing, and other evaluations normally conducted for activities subject to the act. The project is in full compliance.

#### 4.15.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. Coordination with the National Marine Fisheries Service (NMFS) has been accomplished during review of the Broward County SPP DEIS. The project will be in compliance with this Act

#### 4.15.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

No migratory birds would be affected by project activities. The project is in compliance with these Acts.

#### 4.15.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The term "dumping" as defined in the Act (333 U.S.C. 1402](f)) does not apply to the disposal of material for beach nourishment or to the placement of material for a purpose other than disposal (i.e. placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this DEIS have been evaluated under Section 404 of the Clean Water Act.

#### 4.15.20 MAGNUSON-STEVENSON FISHERY CONSERVATION AND MANAGEMENT ACT

This act requires preparation of an Essential Fish Habitat (EFH) Assessment and coordination with the National Marine Fisheries Service (NMFS). Pursuant to the Magnuson-Stevens Act, Essential Fish Habitat (EFH) consultation with the National Marine Fisheries Service for the proposed placement of the sediment on the beach was initiated by coordination of the Broward County SPP DEIS. The project will be in full compliance with this act.

#### 4.15.21 E.O. 11990, PROTECTION OF WETLANDS

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

#### 4.15.22 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. Project will be in compliance with this Act.

#### 4.15.23 E.O. 12898, ENVIRONMENTAL JUSTICE

The proposed action would not result in adverse health or environmental effects. Any impacts of this action would not be disproportionate toward any minority. The activity does not (a) exclude persons from participation in, (b) deny persons the benefits of, or (c) subject persons to discrimination because of their race, color, or national origin. The activity would not impact "subsistence consumption of fish and wildlife."

#### 4.15.24 E.O. 13089, CORAL REEF PROTECTION

This EO refers to "those species, habitats, and other natural resources associated with coral reefs."

The reef distribution pattern for southeast Florida north of Key Biscayne consists of three separate parallel reef flats. The nearshore hardbottom epibenthic communities landward of the equilibrium toe of fill do not represent irreplaceable resources; and with proper placement of mitigative artificial reefs, suitable replacement habitat can be created for nearshore epibenthic species. The proposed project will be in compliance with this Executive Order.

## 5 LIST OF PREPARERS

### 5.1 PREPARERS

Preparer	Discipline	Role
Terri Jordan	Biologist	Principal Author
Brian Brodehl	Engineer	Engineering
Grady Caulk	Archaeologist	Historic Properties

### 5.2 REVIEWERS

Reviewer	Discipline	Role
Steve Higgins	Beach Erosion Control Administration, Policy, Interagency Coordination	Principal Contact – Broward County Shore Protection Project
Charles Stevens	Engineer	Corps of Engineers – Project Manager – Broward County Shore Protection Project
Steven Ross	Engineer	Corps of Engineers – Project Manager – Port Everglades Feasibility Study
Allan Sosnow	Marine Biologist	Environmental Manager – Port Everglades
Kenneth Dugger	Biologist	Assistant Chief, Environmental Branch – Jacksonville District, COE

## 6 PUBLIC INVOLVEMENT

### 6.1 SCOPING

A public notice for a Department of the Army Permit (199905545) dated April 26, 2000 was issued for the Shore Protection Project and the Florida Department of Environmental Protection issued a notice of intent to issue a joint coastal permit (File No. 0163435-001-JC) dated October 17, 2002, and issued the joint coastal permit on May 12, 2003 (Appendix C). Additional scoping was conducted on the SPP via a notice in the Federal Register (64 FR 58351) and Notices were mailed to appropriate local, state, and federal agencies as well as environmental groups. New public notices will

be prepared by the Corps of Engineers – Regulatory Branch and the FLDEP for their respective permits issued to Broward County to address this maintenance-dredging event as a component of the Shore Protection Project. A draft of this Environmental Assessment dated June 26, 2003 was distributed to the resource agencies and other interested parties for review and comment.

## **6.2 COMMENTS RECEIVED AND RESPONSE**

Comments received on the June 2003 Draft Environmental Assessment have been incorporated into this EA. In addition, numerous comments were received on the DEIS issued for the Shore Protection Project and all of the comments were addressed in the FEIS. The Corps-Regulatory Branch and the FLDEP will address any comments received on the new public notices.

## REFERENCES

- Broward County, 2003. Port Everglades Website. <http://www.broward.org/port>. Accessed on May 29, 2003.
- Burney, C. and W. Margolis. January 1998. Sea Turtle Conservation Report 1997 (Technical Report 97-08). Nova Southeastern University. Broward County Board of County Commissioners, Department of Natural Resource Protection Biological Resource Division. Dania, Florida.
- Burney, C. and W. Margolis. March 1999. Sea Turtle Conservation Report 1998 (Technical Report 99-09). Nova Southeastern University. Broward County Board of County Commissioners, Department of Natural Resource Protection Biological Resource Division. Dania, Florida.
- Coastal Planning & Engineering, Inc. (CPE). July 1992. Hillsboro Inlet Management Plan. Prepared for the Hillsboro Inlet Improvement and Maintenance District. Coastal Planning & Engineering: Boca Raton, Florida.
- Coastal Technology Corporation. March 1994. Port Everglades Inlet Management Plan. Prepared for the Department of Natural Resource Protection, Broward County, Florida. Coastal Technology Corporation: Coral Gables, Florida.
- Crocker, R.A. 1977. Macroinfauna of Northern New England Marine Sand: Long-term Intertidal Community Structure. Pp. 439-450 in: B.C. Coull, ed., Ecology of Marine Benthos. University of South Carolina Press: Columbia, South Carolina
- Dean, Robert G., Director. Division of Beaches and Shores. Personal correspondence to Thomas J. Campbell, Coastal Planning & Engineering, Inc., January 22, 1987.
- Dexter, D.M. 1972. Comparison of the Community Structure in a Pacific and Atlantic Panamanian Sandy Beach. Bulletin of Marine Science. 22: 449-462.
- Deutsch, C.J. 2000. Winter movements and use of warm-water refugia by radio-tagged West Indian manatees along the Atlantic Coast of the United States. Final Report prepared for Florida Power and Light Company and U.S. Geological Survey. 74pp. + append.
- Dodge, R. E., S. Hess, and C. Messing. January 1991. Final Report: Biological Monitoring of the John U. Lloyd Beach Renourishment: 1989. Prepared for Broward County Board of County Commissioners Erosion Prevention District of the Office of Natural Resource Protection. NOVA University Oceanographic Center: Dania, Florida. 62 pp. plus appendices.

Florida Game and Fresh Water Fish Commission. 1991. Nongame Wildlife Program Technical Report #10, Florida Atlas of Breeding Sites for Herons and Their Allies, UPDATE 1986-89. September 1991

Florida Marine Research Institute (FMRI). May 1999. Reported Sea Turtle Nesting Activity in Florida, 1993-1998.

Futch, C.R. and S.E. Dwinell. 1977. Nearshore Marine Ecology at Hutchinson Island, Florida: 1971-1974. Vol. IX, Lancelets and Fishes. Florida Marine Research Publication No. 25. 23 pp.

Gilmore R.G. 1977. Fishes of the Indian River Lagoon and Adjacent Waters, Florida. Bulletin of the Florida State Museum, Biological Science, 22(3): 101-148.

Gilmore R.G., J.C. Donahue, D.W. Cooke, and D.J. Herrema. 1981. Fishes of the Indian River Lagoon and Adjacent Waters, Florida. Harbor Branch Foundation, Inc., Technical Report No. 41. 36 pp.

Goldberg, W. M., P.A. McLaughlin, and S. Mehadevan. 1985. Long Term Effects of Beach Restoration in Broward County, Florida, A Three-Year Overview. Part II: Infaunal Community Analysis. Coral Reef Associates, Inc./Florida International University, Miami, Florida/Mote Marine Laboratory, Sarasota, Florida. 31 pp.

Gorzelany, J. F. and W. G. Nelson. 1987. The Effects of Beach Nourishment on the Benthos of a Subtropical Florida Beach. Marine Environmental Research. 21: 75-94.

Herrema, D. J. 1974. Marine and Brackish Water Fishes of Southern Palm Beach and Northern Broward Counties, Florida. MS Thesis, Florida Atlantic University. 257 pp.

Marsh, G. A., P. R. Bowen, D. R. Deis, D. B. Turbeville, and W.R. Courtenay. 1980. Evaluation of Benthic Communities Adjacent to a Restored Beach, Hallandale (Broward County), Florida, Vol. 11, Ecological Evaluation of a Beach Nourishment Project at Hallandale (Broward County), Florida, MR 80-1(11), U.S. Army Corps of Engineers, Coastal Engineering Research Center.

Mezich, R.R. 2001. Manatees and Florida Power and Light's Lauderdale and Port Everglades Power Plants. A Report Developed for the Florida Fish and Wildlife Conservation Commission, Office of Environmental Services. Bureau of Protected Resources.

Modde, T. 1980. Growth and Residency of Juvenile Fishes Within a Surf Zone Habitat in the Gulf of Mexico. Gulf Research Report 6:377-385.

Modde, T. and S. T. Ross. 1981. Seasonality of Fishes Occupying a Surf Zone Habitat in the Northern Gulf of Mexico. Fisheries Bulletin 78:911-922.

National Marine Fisheries Service. 1997. Regional biological opinion-hopper dredging-South Atlantic coast.

National Marine Fisheries Service. 2002. U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments – 2002. NOAA Technical Memorandum NMFS-NE-169.

Nelson, W. G. 1985. Guidelines for Beach Restoration Projects. Part I - Biological. Florida Sea Grant College. SGC-76. 66 pp.

Odell, Daniel K. 1991. A Review of the Southeastern United States Marine Mammal Stranding Network: 1978-1987. *In*: Reynolds, J.E., III and D. K. Odell (eds.) Marine Mammal Strandings in the United States: Proceedings of the Second Marine Mammal Stranding Workshop; 3-5 December 1987, Miami Florida. *NOAA Technical Report NMFS 98*, pp. 19-23.

Peters, D. J. and W. G. Nelson. 1987. The Seasonality and Spatial Patterns of Juvenile Surf Fishes of the Florida East Coast. *Florida Scientist* 50(2): 85-99.

Shelton, C.R. and P.B. Robertson. 1981. Community Structure of Intertidal Macrofauna on Two Surf-exposed Texas Sandy Beaches. *Bulletin of Marine Science* 31: 833-842.

South Atlantic Fishery Management Council. 1998. Habitat plan for the South Atlantic region: essential fish habitat requirements for fishery management plans of the South Atlantic Fishery Management Council. 457 pp.

Spring, Keith D. June 1981. A Study of Spatial and Temporal Variations in the Nearshore Macrobenthic Populations of the Central Florida East Coast. A Thesis submitted to Florida Institute of Technology, Department of Oceanography and Ocean Engineering, Bio-Environmental Oceanography.

Sterghos, N. 1998. Great Balls O' Fire: Heat Records Set South Florida gets an August heat wave in June. *Sun-Sentinel*. Ft. Lauderdale, Florida. June 15, 1998.

U.S. Army Corps of Engineers (USACE). 1990. Broward County, Florida Shore Protection Project Segment III (Port Everglades to South County Line), General Design Memorandum, Addendum II (Hollywood/Hallandale First Renourishment), Vol. 1.

U.S. Army Corps of Engineers (USACE). 1996. Coast of Florida Erosion and Storm Effects Study, Region III, Feasibility Report with Final Environmental Impact Statement.

U.S. Army Corps of Engineers (USACE). July 1998. Beach Erosion Control and Hurricane Protection Project Dade County, Florida, Modifications at Sunny Isles, Final Environmental Impact Statement.

U.S. Fish and Wildlife Service. 1997. Fish and Wildlife Coordination Act Report, Modifications to: Sunny Isles Beach Project, Dade County, Florida. September 1997.

## **APPENDIX A - SECTION 404(B) EVALUATION**

**SECTION 404(b) EVALUATION**  
**MAINTENANCE DREDGING**  
**PORT EVERGLADES ENTRANCE CHANNEL**  
**BROWARD COUNTY, FLORIDA**

I. Project Description

a. Location. The proposed work will be performed at Port Everglades, Broward County, Florida.

b. General Description. The proposed plan calls for the maintenance dredging of the port Everglades entrance channel. Dredged material will be taken either to the John U. Lloyd Beach State Park to the south of the port for use as beach sediments for the Broward County Shore Protection Project.

c. Authority and Purpose. Maintenance dredging of Port Everglades Entrance Channel was initially authorized under House Document 357/71/2 (July 1930), as well as subsequent authorization associated with Port Expansion activities in 1935, 1938, 1946, 1958, 1974 and 1990. A Comprehensive list of these authorizations can be found at the District's Digital Project Notebook homepage ([http://www.saj.usace.army.mil/digitalproject/dpn/sajn\\_020.htm](http://www.saj.usace.army.mil/digitalproject/dpn/sajn_020.htm)). The purpose of the project is to maintain safe navigation conditions.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. The physical structure of the sediments from the Entrance Channel indicates that the composition is primarily beach quality sand. Examination of the sediments from the inner channel indicates that the composition is comprised primarily of fine quartz based sand; therefore it meets the criteria for beach placement because it contains less than 10% silt and clay materials.

(2) Quantity of Material. Approximately 100,000 cubic yards of sand will be removed from the harbor's entrance channel.

(3) Source of Material. The Entrance Channel is authorized to a depth of 45ft + 2 additional feet of overdepth. Based on the 2002-channel survey conducted by the Jacksonville District, the shoal is 600 feet in length and approximately 120 feet in width at its widest point and approximately 100,000 cubic yards.

e. Description of the proposed Discharge Site.

(1) Location. The John U Lloyd Beach State Park is located immediately south of the Port Everglades Entrance Channel's south Jetty.

(2) Size. John U. Lloyd Beach State Park is 251 acres of barrier island between the Atlantic Ocean and the Intracoastal Waterway, from Port Everglades on the north to Dania on the south.

(3) Type of Site. The John U. Lloyd Beach State Park is a State Park barrier island beach. It has nearshore hard-bottoms and offshore hardbottoms associated with the beach. The beach disposal area is open, sandy beach.

(4) Type of Habitat. As stated above, see Section 3 of the Environmental Assessment for more detail.

(5) Timing and Duration of Discharge. The schedule for dredging is dependant on Broward County modifying their Department of the Army and State Department of Environmental Protection permits. There are time limits that will be placed on dredging of the site and beach placement due to sea turtle nesting on John U. Lloyd Beach State Park beaches.

f. Description of Disposal Method. Disposal could be either from a pipeline or hopper dredge. Sand placed on the beach will be graded out with front-end loaders and bulldozers.

## II. Factual Determinations

### a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. Gentle sloped beach and littoral zone.

(2) Sediment Type. The sediment from the project channel contains fine quartz sand with less than 10% silt and clay materials.

(3) Dredge/Fill Material Movement. Material placed at the John U. Lloyd State Park beach placement area is subject to erosion by waves with net movement of fill material to the south.

(4) Physical Effects on Benthos. The placement of sand on the beach will result in the burial and subsequent loss of most of the beach infauna. Small, short-lived organisms with high reproductive potential generally populate sandy beaches. Beach and surf zone infaunal populations should recover to pre-nourishment levels within one year after completion of nourishment.

### b. Water Circulation, Fluctuation and Salinity Determination.

(1) Water Column Effects. Placement of fill material at the JUL beach placement site will cause a temporary increase in turbidity. Because the immediate nearshore area is subject to naturally occurring elevated turbidity levels caused by the surf, increases due to the project will not be significant. Fill placement will not have long-term or significant impacts, if any, on salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, nutrients or eutrophication

(2) Current Patterns and Circulation. Currents in the project area are both tidal and longshore. Net movement of water due to the longshore current is from the north to the south. Dredging of the Entrance Channel and beach placement will not affect the current patterns and circulation.

(3) Normal Water Level Fluctuations and Salinity Gradients. Tides in the project area are semi-diurnal. Elevations of mean high water and mean low water tidal datum in Broward County were reported to be +1.64 feet (NGVD) and -0.89 feet (NGVD) (USACE, 1994). Dredging and disposal operations will not affect normal tide fluctuations or salinity.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in the Vicinity of the Disposal Site. There will be a temporary increase in turbidity levels in the project area during placement. Turbidity will be short-term and localized and no significant adverse impacts are expected. State standards for turbidity should not be exceeded.

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

a. Light Penetration. The placement of fill on the beach will increase turbidity in the nearshore area during construction. Because the immediate nearshore area is a high wave energy system and subject to naturally occurring elevated turbidity and sediment, increases due to project construction should not be significant. A nearshore turbidity-monitoring program with a plume-mixing zone of 150 meters from the discharge site will be implemented during construction. Turbidity and sedimentation at the sand borrow site in the Entrance Channel is likely due to the filling/washing of the material on the hopper dredge. Turbidity will be monitored during construction, and State standards for turbidity should not be exceeded. Light penetration will decrease during discharge in the immediate area where sand is being deposited on the beach. This effect will be short-term and have limited adverse impacts on the nearshore environment during construction activities. A long-term nearshore-monitoring program will be implemented to assess the potential secondary impacts of sedimentation and turbidity to

- nearshore hardbottom communities adjacent to the equilibrium toe of fill.
- b. Dissolved Oxygen. Dissolved oxygen levels will not be altered by this project.
  - c. Toxic Metals, Organics, and Pathogens. No toxic metals, organics, or pathogens will be disturbed or released at levels that exceed state standards.
  - d. Aesthetics. Aesthetic quality will be reduced during that period when work is occurring. There will be a long-term increase in aesthetic quality of the beach once the work is completed.
- (3) Effects on Biota.
- a. Primary Productivity and Photosynthesis. A temporary increased level of suspended particles will occur in the surf zone during construction. However, since primary productivity is not a recognized significant phenomenon in the surf zone, there will be limited effects on nearshore productivity as a result of the proposed beach placement.
  - b. Suspension/Filter Feeders. There will be no long-term adverse impact to suspension/filter feeders.
  - c. Sight Feeders. There will be no long-term adverse impact to sight feeders.
- (4) Contaminant Determinations. Deposited fill material will not introduce, relocate, or increase contaminants.
- (5) Aquatic Ecosystem and Organism Determinations. The grain size characteristics and composition exhibited by the proposed fill material are similar to those of the existing beach sediments. Therefore, no sediment related impacts are expected. The proposed fill material meets the exclusion criteria; therefore, no additional chemical-biological testing will be required.
- a. Effects on Plankton. No adverse long-term impacts to planktonic organisms are anticipated.
  - b. Effects on Benthos. No adverse long-term impacts to non-motile or motile Benthic invertebrates or invertebrates.
  - c. Effects on Nekton. No adverse long-term impacts to nektonic species are anticipated.
  - d. Effects on the Aquatic Food Web. No adverse long-term impacts to any trophic group in the food web are anticipated.
  - e. Effects on Special Aquatic Sites.
    - i. Hardground and Coral Reef Communities. Beach nourishment activities within the Broward County SPP study area will cover 13.6 acres of nearshore hardbottom habitat. Approximately 2.0 acres of nearshore hardbottom will be directly buried during construction, and the remaining 11.6 acres will be gradually impacted by beach fill equilibration. Overall, the nearshore hardbottom communities do not

represent irreplaceable resources and with proper mitigation, suitable replacement habitat can be created for epibenthic and fish species. Approximately six acres of limestone boulder mitigative reef will be constructed prior to beach project construction to compensate for the temporal lag in habitat functionality.

- ii. Sanctuaries and Refuges. There are no sanctuaries or wildlife refuges located within the proposed dredge or beach placement areas.
  - iii. Wetlands. There are no wetlands located within the proposed dredge or beach placement areas.
  - iv. Mud Flats. There are no mud flats located within the proposed dredge or beach placement areas.
  - v. Vegetated Shallows. There are no known vegetated shallows (seagrasses) located within the proposed dredge or beach placement areas.
  - vi. Riffle and Pool Complexes. There are no riffle and pool complexes within the proposed dredge or beach placement areas.
- (6) Endangered and Threatened Species. There will be no significant impacts on any threatened or endangered species or on designated Critical Habitat of any threatened or endangered species. Sea turtle nesting may occur in the project area during the time that dredging and beach disposal takes place. If construction occurs during the nesting season, a nest relocation program will be implemented as recommended by the USFWS. Manatee protection measures as specified by the USFWS will be followed to minimize the potential for harm. See Sections 3 and 4 of the Environmental Assessment.
- (7) Other Wildlife. No adverse impacts to small foraging mammals, reptiles, wading birds, or wildlife in general are expected.
- (8) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance environmental, aesthetic, recreational, and economic values in the project area. Specific precautions that will be implemented in conjunction with the proposed project are discussed elsewhere in this 404(b) evaluation and in the Draft Environmental Impact Statement for the project. See Section 4 of the Environmental Assessment.

f. Proposed Disposal Site Determinations.

- (1) Mixing Zone Determination. During the placement operations, there will be temporary elevated levels of turbidity in the surrounding waters.
- (2) Determination of Compliance with Applicable Water Quality Standards. The work will be conducted in accordance with the state of Florida Joint Coastal and the Department of the Army permits issued to the County issued for this project.

(3) Potential Effects on Human Use Characteristics.

- a. Municipal and Private Water Supplies. No effects are anticipated.
- b. Recreational and Commercial Fisheries. Impacts caused by dredging and placement activities will be minor and short-term.
- c. Water Related Recreation. Construction activities will temporarily disrupt recreational opportunities. Dredging will maintain the navigational capacity of the project channel for recreational boaters. Placement of dredged material on the beach will preserve and enhance recreational beach activities.
- d. Aesthetics. Construction will temporarily adversely impact the aesthetics of the area. Placement of dredged sand on the beach will compensate for losses caused by erosion and improve the aesthetics of the beach environment.
- e. Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. The 1.5-mile section of beach between R-86 and R-94 at John U. Lloyd Beach State Park has already been restored through nourishment with a periodic renourishment interval of 6 years. Biological monitoring of the J. U. Lloyd Beach Renourishment of 1989 revealed that although major faunal shifts occurred in the softbottom communities within the toe of fill site of the beach nourishment area, no pattern of hardground organism abundance relative to dredge or fill activities was observed (Dodge et al., 1991). Coordination with the Ranger of the John U. Lloyd Beach State Park revealed that beach nourishment was needed to combat erosion near the parking areas (Leve, 1995).

Approximately 0.9 acres of low-profile hardbottom dominated by macroalgae and blue-green algae will be directly buried at the time of construction in John U. Lloyd Beach State Park. This habitat exhibits a high level of nutrification, evidenced by the extensive coverage of macroalgae and blue-green algae and depauperate faunal communities. Anthropogenic influences upon this habitat are likely the result of Port Everglades Inlet output of nutrient and freshwater flow, creating turbidity and sudden temperature and salinity fluctuations. Given the natural and anthropogenic influences upon this habitat, alternative replacement habitat can be created which provides higher faunal utilization. Therefore, no adverse impacts to irreplaceable hardbottom biological resources are expected. The proposed Broward County Shore Protection Project Determination of Cumulative Effects on the Aquatic Ecosystem would directly or indirectly impact no other State Park or aquatic preserves.

Cumulative effects that will adversely impact the aquatic ecosystem as a result of dredging and placement activities are not anticipate

- f. Determination of Secondary Effects on the Aquatic Ecosystem. There will be no significant cumulative impacts that result in a major impairment of water quality of the existing aquatic ecosystem as a result of placement of fill at the project site. If determined feasible, sand-bypassing activities at Port Everglades would create ongoing, local turbidity in the vicinity of the port. This habitat is subjected to apparent Port Everglades Inlet related influences of nutrient and freshwater output and is dominated by macroalgal/blue-green algae communities with low faunal utilization. The impacts of disposing material on the beach during these dredging cycles would be minor. Sand-bypassing at Port Everglades could potentially eliminate the need for larger scale renourishment projects on the beaches downdrift of the port, thereby avoiding impacts associated with these projects. Secondary effects that will adversely impact the aquatic ecosystem as a result of dredging and placement activities are not anticipated.

### III. Findings of Compliance or Non-compliance with the Restrictions on Discharge.

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

- b. No practicable alternative exists which meets the study objectives that does not involve discharge of fill into waters of the United States.

- c. After consideration of disposal site dilution and dispersion, the discharge of fill materials will not cause or contribute to, violations of any applicable state water quality standards for Class III waters. The discharge operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

- d. The maintenance dredging of the port Everglades entrance channel will not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

- e. The placement of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic species and other wildlife will not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values will not occur.

- f. On the basis of the guidelines, the proposed disposal site for the discharge of dredged material is specified as complying with the requirements of these guidelines.

## **APPENDIX B - COASTAL ZONE MANAGEMENT CONSISTENCY**

**FLORIDA COASTAL ZONE MANAGEMENT PROGRAM  
FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**MAINTENANCE DREDGING  
PORT EVERGLADES ENTRANCE CHANNEL  
BROWARD COUNTY, FLORIDA**

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

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

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

Response: The proposed project has been coordinated with various federal, state and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the shorefront development and infrastructure.

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

Response: The proposed project involves the dredging of the Port Everglades Entrance Channel in order to maintain safe navigation conditions. It also involves the placing of beach compatible material onto an eroding beach as a protective means for residents, development and infrastructure located along the Atlantic shoreline within Broward County. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

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

Response: Maintenance dredging of the Port Everglades Entrance Channel has been performed on multiple occasions in the past. Project activities have complied with state regulations pertaining to the above resources. The proposed project would comply with the intent of this chapter.

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

Response: Since the affected property already is in public ownership, this chapter does not apply.

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

Response: The proposed project will affect the John U. Lloyd Beach State Park. Project related activities have been fully coordinated with the state. The project is consistent with this chapter.

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

Response: This project has been coordinated with the State Historic Preservation Officer (SHPO). Survey results indicated no historical properties in the project area. The project will be consistent with the goals of this chapter.

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

Response: The maintenance dredging of the Port Everglades Entrance Channel encourages economic growth of the area. Also, the proposed beach nourishment would provide more space for recreation and the protection of recreational facilities along the receiving beach. This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

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

Response: The maintenance dredging of the Port Everglades Entrance Channel promotes navigation within the harbor and the Intracoastal Waterway.

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

Response: Dredging activities should not adversely impact saltwater living resources. The placement of sand on the beach will create a larger more suitable area for nesting sea turtles. The proposed beach fill may represent a temporary short-term impact to invertebrates by burying these organisms. However, these organisms are highly adapted to the periodic burial by sand in the intertidal zone. These organisms are highly fecund and are expected to return to pre-construction levels within 6 months to one year after construction. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

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

Response: The project will have no effect on freshwater aquatic life or wild animal life. Therefore, the work would comply with the goals of this chapter.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

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

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

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

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

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

Response: The proposed dredging of the Port Everglades Entrance Channel has been coordinated with the local regional planning commission. Therefore, the project is consistent with the goals of this chapter.

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

Response: The project will not increase the potential propagation of mosquitoes or other pest arthropods.

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

Response: Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. A Joint Coastal Permit has been issued by the state. The project complies with the intent of this chapter.

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

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

## **APPENDIX C - PERTINENT CORRESPONDENCE**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 4  
ATLANTA FEDERAL CENTER  
61 FORSYTH STREET  
ATLANTA, GEORGIA 30303-8960

JUN 26 2003

District Engineer  
Jacksonville District, Corps of Engineers  
P.O. Box 4970  
Jacksonville, FL 32232

ATTN: Mr. James C. Duck, Chief  
Planning Division

**SUBJECT: Environmental Assessment (EA) for Port Everglades Entrance  
Channel, Broward County, Florida (dtd June 2003)**

Dear Sir:

Pursuant to Section 309 of the Clean Air Act, EPA, Region 4 has reviewed the subject document, an evaluation of the environmental consequences attendant to the ongoing navigation maintenance for Port Everglades. In this particular instance unexpected shoaling of the entrance channel has increased navigational difficulty via reduction of the controlling water depths and by extension diminished the ability of shipping to safely transit the port. Since this shoal contains approximately 100,000 cubic yards of beach quality sand (less than 2% fines), the Jacksonville District approached Broward County with the proposal to use this material to renourish an eroding section of nearby John U. Lloyd State Park. While the matter remains under discussion, there is already a proposal to nourish the Park with material excavated from an offshore source. Since the two actions (dredging and beach nourishment) are already scheduled, there is an obvious appeal to this linkage.

EPA always has some environmental concerns regarding the long term consequences of dredging activities, especially beach nourishment projects which attempt to forestall the inevitable erosion resulting from various acute/chronic marine processes. While acknowledging the importance of protecting a valuable recreational property such as the Park, such protection should not come at the unnecessary sacrifice of important offshore hardground and benthic habitats. In this case, the use of a sand source from within the channel confines (which will be dredged irrespectively) would engender lesser adverse impacts than mining an offshore borrow site(s). Hence, when the involved parties make their final determination on how the noted shoaling will be addressed, we urge that the environmental components of the decision-making equation receive equal consideration with economics.

Given the scope of this shoal removal and its anticipated limited, detrimental effects, we have no significant objections to the use of an EA as the evaluative model to examine this project's impacts in lieu of the more comprehensive environmental impact statement format. Thank you for the opportunity to comment. If we can be of further assistance in this matter, Mr. Ron Miedema (561-616-8641) of our South Florida Office will serve as initial point of contact.

Sincerely,

A handwritten signature in cursive script, appearing to read "H. Mueller".

Heinz J. Mueller, Chief  
Office of Environmental Assessment  
Environmental Accountability Division



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE

Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

July 16, 2003

James C. Duck, Chief  
Planning Division, Environmental Branch  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

The National Marine Fisheries Service (NOAA Fisheries) has reviewed the **Port Everglades Entrance Channel Maintenance Dredging Draft Environmental Assessment (DEA)**, dated June 26, 2003. The proposed project is located in the vicinity of the Dania Sound in Broward County, Florida. The Recommended Plan includes maintenance dredging of approximately 100,000 cubic yards of material from the harbor's entrance channel. As a result of shoaling, an approximate 600-foot-long by 120-foot-wide bar area has accreted along the north side of the entrance channel. The authorized channel depth is -45 feet + 2 additional feet of overdepth at mean low water (m.l.w.); however, the north side of the channel currently has a controlling depth of -26.4 feet at m.l.w. Waters within the proposed dredging area are located within State of Florida Class III waters, which are designated for recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife.

By letter dated April 26, 2001, NOAA Fisheries provided preliminary comments to the Army Corps of Engineers (COE) regarding the Port Everglades expansion project. Considering the potential impact from the proposed project on Essential Fish Habitat (EFH), Habitat Areas of Particular Concern (HAPC), and other NOAA Fisheries-trust resources, we recommended that the Environmental Impact Statement (EIS) for this project include an EFH Assessment that identifies and describes EFH and other fishery resources in the vicinity of the project; an assessment of impacts to EFH associated with each action alternative; the COE's views regarding the effects of the action on EFH; and proposed mitigation that would fully offset any losses of the functions and values of wetlands, aquatic resources, and EFH. We also recommend that the mitigation plan include a complete analysis of the proposed locations for wetland restoration and/or creation. In addition, we recommended the COE evaluate alternatives to blasting and land acquisition issues; however, we recognize that this last comment does not pertain to the currently proposed action.



The COE had originally planned to conduct this dredging as a part of the planned Port Everglades expansion project currently being studied by the Jacksonville District under the Port Everglades Feasibility Study. However, according to the information provided, the Port Everglades project may not be initiated until 2005 or 2006, due to study delays. In the interim, the COE approached Broward County to determine their interest in utilizing the beach quality sediment, to be removed in connection with maintenance dredging, as part of the county's Shore Protection Project (SPP). NOAA Fisheries participated in interagency working groups involving the SPP and we provided comments to the Jacksonville District by letters dated June 3, 2002, and July 5, 2002. The county has expressed interest in utilizing material found in the channel and thereby reducing the amount of sediment that must be dredged from offshore borrow areas. This would reduce impacts to the offshore borrow areas and surrounding coral and hardbottom reef habitats.

#### General comments:

NOAA Fisheries is concerned that the project may adversely impact EFH. The water column and coastal inlets are identified as EFH by the South Atlantic Fishery Management Council (SAFMC). Larvae of several important recreational and commercial fishes (e.g., shrimp and red drum) are transported through inlets into shallow estuaries where food and cover are relatively abundant. Larval shrimp, red drum, and other inhabitants of the water column also utilize exported nutrients from other estuarine locations even though they may not physically occupy these environments until later in their life cycles. While less frequently cited as fishery habitat than mangroves, salt marsh, seagrass beds, and reefs, the water column performs a vital role as a transport medium for nutrients and organisms that must move through and often between the open ocean, estuaries, and riverine environments in order to complete requisite life stages.

Federally managed species associated with coastal inlets include penaeid shrimp and red drum. Detailed information on shrimp, red drum, and other Federally managed fisheries and their EFH is provided in the 1998 amendment of the Fishery Management Plans for the South Atlantic region prepared by the South Atlantic Fishery Management Council (SAFMC). The 1998 generic amendment was prepared in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (P.L. 104-297). In addition to their designation as EFH, coastal inlets have been designated as Habitat Areas of Particular Concern (HAPC) by the SAFMC. HAPCs are subsets of EFH that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area.

#### Specific Comments:

In concept, NOAA Fisheries supports the use of the dredged material from the Port Everglades entrance channel for beach fill at John U. Lloyd Park, as opposed to dredging beach compatible sand from more sensitive offshore marine bottoms. NOAA Fisheries recognizes that the impacts associated with the placement of beach fill have largely been examined in previous documents. However, we remain concerned over aspects of dredging and transport of dredged material that were not addressed in the EA. These concerns are as follows:

1. It is our understanding, based on coordination with the Jacksonville District, that benthic surveys of the area to be dredged were completed in conjunction with the Port Everglades Feasibility Study and the Port Everglades Draft EIS. Please provide a recent benthic characterization of the impact area for NOAA Fisheries review.
2. NOAA Fisheries recommends the COE develop and implement, where feasible, methodologies that would minimize project related turbidity and sedimentation. Methodologies to be implemented should be provided to NOAA Fisheries for review and for the opportunity to provide comments and recommendations.
3. The EA recognizes that coastal inlets in southeast Florida may support corals. However, site specific information is not provided in the EA concerning effects of dredging on coral and hardbottom resources in the vicinity of the proposed work. Please provide NOAA Fisheries with information regarding the extent and percent coverage of coral and hardbottom resources adjacent to the proposed dredging. Methods that would be used to avoid and minimize impacts to these sensitive areas should also be provided to NOAA Fisheries for review.
4. During development of the Broward County SPP, NOAA Fisheries worked with the county to identify pipeline corridors for transport of dredged material from borrow areas to the beach. It is not clear to us, from the information provided, how the material will be transported from the Port to the John U. Lloyd beach fill area. If transported via pipeline, a description of the proposed corridors and the and a characterization of benthic habitats in the vicinity of the corridors should be provided for our review.
5. According to the information provided, one or more of the five borrow areas, as identified in the Broward County Draft EIS for the SPP, will be eliminated from the beach renourishment project design. Please provide NOAA Fisheries with information regarding which borrow area(s) will be eliminated from the project design.
6. According to the EA, the Jacksonville District will be collecting additional sediment cores and expects the material to be a mix of carbonate and quartz medium grain sand with a very low (<2%) fine component. Please provide NOAA Fisheries with a summary of the results of the geotechnical investigation, when this information becomes available.

Although we do not believe that the proposed action should be delayed, we need additional information on the dredging and sediment transport component of the proposed work and potential impacts to living marine resources for which we have management and conservation responsibilities. Upon review of the aforementioned requested items, NOAA Fisheries will, as needed, provide further comments and recommendations on the proposed work.

#### **EFH Conservation Recommendation:**

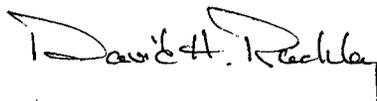
The project should be held in abeyance until the six above-mentioned items are provided to NOAA Fisheries for review and comment.

Section 305(b)(4)(B) of the Magnuson-Stevens Act and NOAA Fisheries' implementing regulation at 50 CFR Section 600.920(k) require your office to provide a written response to this letter within 30 days of its receipt. If it is not possible to provide a substantive response within 30 days, in accordance with our "findings" with the your Regulatory Functions Branch, an interim response should be provided to NOAA Fisheries. A detailed response then must be provided prior to final approval of the action. Your detailed response must include a description of measures proposed by your agency to avoid, mitigate, or offset the adverse impacts of the activity. If your response is inconsistent with our EFH Conservation Recommendation, you must provide a substantive discussion justifying the reasons for not following the recommendation.

These comments do not satisfy your consultation responsibilities under Section 7 of the Endangered Species Act of 1973, as amended. If any activity(ies) "may effect" listed species and habitats under the purview of NOAA Fisheries, consultation should be initiated with our Protected Resources Division at the letterhead address.

We appreciate the opportunity to provide these comments. Related correspondence should be addressed to the attention of Ms. Jocelyn Karazsia at our Miami Office. She may be reached at 11420 North Kendall Drive, Suite #103, Miami, Florida 33176, or by telephone at (305) 595-8352.

Sincerely,



Frederick C. Sutter III  
Deputy Regional Administrator

cc:  
EPA, WPB  
DEP, WPB  
FFWCC, Tallahassee  
FWS, Vero Beach  
Broward County DPEP  
COE-Palm Beach Gardens Regulatory Office  
F/SER4  
F/SER45-Karazsia

Planning Division  
Environmental Branch

Mr. Rickey Ruebsamen  
Acting Assistant Regional Administrator  
Habitat Conservation Division  
National Marine Fisheries Service  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

Dear Mr. Ruebsamen:

Thank you for the Essential Fish Habitat Conservation Recommendations included in your July 16, 2003 letter for the Port Everglades Entrance Channel Maintenance Dredging Draft Environmental Assessment in Broward County, Florida. A detailed reply to the six Essential Fish Habitat (EFH) recommendations is enclosed. We intend to comply with most of the EFH recommendations (2,4,5,6). The remaining recommendations are not under our jurisdiction or are economically infeasible to implement.

If you have any questions, please contact Terri Jordan at 904 232-1817.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

Copy Furnished:  
Mr. Steve Higgins; Broward County Department of Planning and Environmental Protection; Biological Resources Division. 218 S.W. 1<sup>st</sup> Ave. Ft. Lauderdale, Florida 33301

Jordan/CESAJ-PD-EA/1817/  
McAdams/CESAJ-PD-EA  
Mason/CESAJ-PD-E  
Ross/CESAJ-DP-C  
Strain/CESAJ-PD-P  
Duck/CESAJ-PD

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Recommendations.doc

**Recommendation #1** – It is our understanding, based on coordination with the Jacksonville District, that Benthic surveys of the area to be dredged were completed in conjunction with the Port Everglades Feasibility Study and the Port Everglades Draft EIS. Please provide a recent Benthic characterization of the impact area for NOAA Fisheries review.

Response – The Corps is unable to provide the benthic survey at this time, since it is part of a pre-decisional document still in preparation (the Port Everglades Feasibility Study and Draft EIS). However, Ken Banks of Broward county DPEP has volunteered to take NMFS staff out to review the impact site – which is a sandy shoal in the entrance channel – often referred to as “the ski slope” by DPEP staff. Please let us know if you are interested in pursuing this option.

**Recommendation #2** – NOAA Fisheries recommends the COE develop and implement, where feasible, methodologies that would minimize project related turbidity and sedimentation. Methodologies to be implemented should be provided to NOAA Fisheries for review and for the opportunity to provide comments and recommendations.

Response – If Broward County opts to dredge the Entrance Channel and use the sand as proposed in the DEA, they will abide by the conditions of the State of Florida, Department of Environmental Protection joint Coastal Permit issued on May 12, 2003 and included in Appendix C of the DEA for review. NMFS was involved in the coordination and development of this permit, so the Corps believes that Recommendation #2 has been met.

**Recommendation #3** – The EA recognizes that coastal inlets in southeast Florida may support corals. However, site-specific information is not provided in the EA concerning effects of dredging on coral and hardbottom resources in the vicinity of the proposed work. Please provide NOAA Fisheries with information regarding the extent and percent coverage of coral and hardbottom resources adjacent to the proposed dredging. Methods that would be used to avoid and minimize impacts to these sensitive areas should also be provided to NOAA Fisheries for review.

Response - The Corps is unable to provide the benthic survey at this time, since it is part of a pre-decisional document still in preparation (the Port Everglades Feasibility Study and Draft EIS). Please see response to recommendation #1. Methods to minimize impacts to these areas are included in the State of Florida DEP permit included in Appendix C of the DEA.

**Recommendation #4** – During development of the Broward County SPP, NOAA Fisheries worked with the county to identify pipeline corridors for transport of dredged material from borrow areas to the beach. It is not clear to us, from the information provided, how the material will be transported from the Port to the John U. Lloyd beach fill area. If transported via pipeline, a description of proposed corridors and the characterization of Benthic habitats in the vicinity of the corridors should be provided for our review.

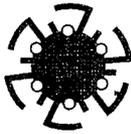
Response – After discussions with Broward County – it has been determined that the sand will be transported by dredge or barge to a pipeline at the back of John U. Lloyd State Park on the Intracoastal waterway to be pumped onto the beach. Mr. Ken Banks of Broward County DPEP provided this information.

**Recommendation #5** – According to the information provided, one or more of the five borrow areas, as identified in the Broward County Draft EIS for the SPP, will be eliminated from the beach renourishment project design. Please provide NOAA Fisheries with the information regarding which borrow areas(s) will be eliminated from the project design.

Response – The offshore borrow areas being used for the SPP are being dredged in a rotation to lessen impacts to adjacent coral reefs. The use of the 100,000 cubic yards will benefit all four of the borrow areas by lessening the amount of sediment being removed from each. Mr. Ken Banks of Broward County DPEP provided this information.

**Recommendation #6** – According to the EA, the Jacksonville District will be collecting additional sediment cores and expects the material to be a mix of carbonate and quartz medium grain sand with a very low (<2%) fine component. Please provide NOAA Fisheries with a summary of the results of the geotechnical investigation, when this information becomes available.

Response – Upon completion of the geotechnical investigation – the Corps will make the data available to NOAA Fisheries if the data indicates that the sediment is different than what was reported in the DEA.



July 24, 2003

Mr. James C. Duck  
Chief, Planning Division  
Department of the Army  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, FL 32232-0019

RE: SFRPC #03-0654, Request for comments on an Environmental Assessment (EA) of utilizing dredge materials from the Port Everglades Channel as a borrow area for beach renourishment at John U. Lloyd State Park, U.S. Army Corps of Engineers, Hollywood, Broward County.

Dear Mr. Duck:

We have reviewed the above-referenced EA and have the following comments:

- Council staff believes the dredging project is a first step towards a necessary systematic and comprehensive approach towards resolving issues of beach erosion and renourishment and inlet and jetty maintenance in Broward County. Such an approach should include commitments by all user groups to a dedicated funding source for periodic channel maintenance and mechanical assistance of sand movement past existing jetties to prevent extreme accretion/erosion and maintain beach profiles without resorting to offshore dredging or sand importation. Council staff believes that groin installation in John U. Lloyd State Park is unnecessary and counterproductive to long-term beach maintenance, particularly if the above-described approach is utilized.
- The project is located within the near shore waters of the Atlantic Ocean, a natural resource of regional significance designated in the *Strategic Regional Policy Plan for South Florida* (SRPP). The goals and policies of the SRPP should be considered when making decisions regarding this project, particularly the following:

#### Strategic Regional Goal

- 3.8 Enhance and preserve natural system values of South Florida's shorelines, estuaries, benthic communities, fisheries, and associated habitats, including but not limited to, Florida Bay, Biscayne Bay and the coral reef tract.

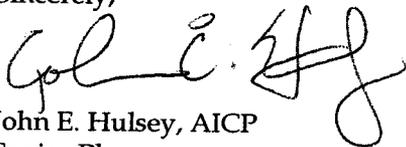
#### Regional Policies

- 3.8.1 Enhance and preserve natural shoreline characteristics through requirements resulting from the review of proposed projects and in the implementation of ICE, including but not limited to, mangroves, beaches and dunes through prohibition of structural shoreline stabilization methods except to protect existing navigation channels, maintain reasonable riparian access, or allow an activity in the public interest as determined by applicable state and federal permitting criteria.

- 3.8.2 Enhance and preserve benthic communities, including but not limited to seagrass and shellfish beds, and coral habitats, by allowing only that dredge and fill activity, artificial shading of habitat areas, or destruction from boats that is the least amount practicable, and by encouraging permanent mooring facilities. Dredge and fill activities may occur on submerged lands in the Florida Keys only as permitted by the Monroe County Land Development Regulations. It must be demonstrated pursuant to the review of the proposed project features that the activities included in the proposed project do not cause permanent, adverse natural system impacts.
- 3.8.3 As a result of proposed project reviews, include conditions that result in a project that enhances and preserves marine and estuarine water quality by:
- a) improving the timing and quality of freshwater inflows;
  - b) reducing turbidity, nutrient loading and bacterial loading from wastewater facilities, and vessels;
  - c) reducing the number of improperly maintained stormwater systems; and
  - d) requiring port facilities and marinas to implement hazardous materials spill plans.
- 3.8.4 Enhance and preserve commercial and sports fisheries through monitoring, research, best management practices for fish harvesting and protection of nursery habitat and include the resulting information in educational programs throughout the region. Identified nursery habitat shall be protected through the inclusion of suitable habitat protective features including, but not limited to:
- a) avoidance of project impacts within habitat area;
  - b) replacement of habitat area impacted by proposed project; or
  - c) improvement of remaining habitat area within remainder of proposed project area.
- 3.8.5 Enhance and preserve habitat for endangered and threatened marine species by the preservation of identified endangered species habitat and populations. For threatened species or species of critical concern, on-site preservation will be required unless it is demonstrated that off-site mitigation will not adversely impact the viability or number of individuals of the species.

Thank you for the opportunity to comment. If you require further information, please contact me.

Sincerely,



John E. Hulsey, AICP  
Senior Planner

JEH/kal

Cc: Jaye Epstein, City of Hollywood Community Planning  
Steve Somerville, Broward County DPEP



# Department of Environmental Protection

Jon Bush  
Governor

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

David B. Struhs  
Secretary

October 10, 2003

Mr. James C. Duck, Chief  
Planning Division, Jacksonville District  
U. S. Army Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

RE: Department of the Army, Jacksonville District Corps of Engineers – Draft Environmental Assessment – Maintenance Dredging, Port Everglades Entrance Channel – Fort Lauderdale, Broward County, Florida.  
SAI # FL200308283720C

Dear Mr. Duck:

The Florida State Clearinghouse, pursuant to Executive Order 12372, Gubernatorial Executive Order 95-359, the Coastal Zone Management Act, 16 U.S.C. §§ 1451-1464, as amended, and the National Environmental Policy Act, 42 U.S.C. §§ 4321, 4331-4335, 4341-4347, as amended, has coordinated the review of the above-referenced Draft Environmental Assessment (EA).

Department (FDEP) staff notes that construction of the project would be consistent with the provisions of Rule 62B-41.005, *Florida Administrative Code*, regarding placement of coastal inlet sediments on downdrift beaches. However, FDEP requests that the U. S. Army Corps of Engineers provide sufficient data and analysis of the sediment cores collected in the Port Everglades Entrance Channel to demonstrate compliance with the provisions of Chapter 161, *Florida Statutes*, and Rule 62B-41.007, *F.A.C.*, regarding beach compatible fill. Please see the attached memo provided previously by the FDEP Bureau of Beaches and Wetland Resources for further information.

Florida Department of Transportation (FDOT) staff notes that conflicts may arise between the proposed dredging project and future roadway construction of the Eller Drive Intermodal Cargo Transfer Facility (ITCF). Project scheduling should be coordinated with Mr. Richard Young, Project Manager, at (954) 777-4323. Please see the attached FDOT comments.

South Florida Water Management District (SFWMD) staff recommends that the EA address the potential effects of channel opening alterations on salinity and flushing actions, and any resulting impacts to receiving water quality, estuarine habitats, and estuarine species.

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Printed on recycled paper.

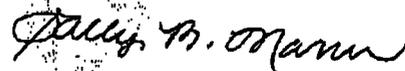
Mr. James C. Duck  
October 10, 2003  
Page 2 of 2

Concerns regarding the substantial cumulative effects of future port construction and improvement projects on salinity and flushing have been expressed. Please refer to the SFWMD comments on the enclosed Clearinghouse summary report.

Based on the information contained in the Draft EA and the enclosed comments, the state has determined that, at this stage, the allocation of federal funds for the referenced project is consistent with the Florida Coastal Management Program (FCMP). The applicant must, however, address the concerns of agency reviewers as described herein and detailed in the attached comments. All subsequent environmental documents must be reviewed to determine the project's continued consistency with the FCMP. The state's continued concurrence with the project will be based, in part, on the adequate resolution of issues identified during this and subsequent permitting reviews.

Thank you for the opportunity to review this project. If you have any questions regarding this matter, please contact Ms. Lauren P. Milligan at (850) 245-2163.

Sincerely,



Sally B. Mann, Director  
Office of Intergovernmental Programs

SBM/lm  
Enclosures

cc: Roxane Dow, FDEP, BBWR  
Sandra Whitmire, FDOT  
Jim Golden, SFWMD

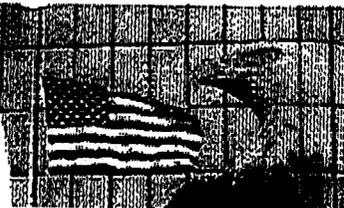


# Florida

Department of Environmental Protection

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Project Information	
<b>Project:</b>	FL200308283720C
<b>Comments Due:</b>	September 24, 2003
<b>Letter Due:</b>	October 11, 2003
<b>Description:</b>	DEPARTMENT OF THE ARMY - JACKSONVILLE DISTRICT CORPS OF ENGINEERS - ENVIRONMENTAL ASSESSMENT - MAINTENANCE DREDGING, PORT EVERGLADES ENTRANCE CHANNEL - FORT LAUDERDALE, BROWARD COUNTY, FLORIDA.
<b>Keywords:</b>	ACOE - EA, MAINTENANCE DREDGING PORT EVERGLADES CHANNEL - BROWARD CO.
<b>CFDA #:</b>	12.107
<b>Agency Comments:</b>	
SOUTH FL RPC - SOUTH FLORIDA REGIONAL PLANNING COUNCIL	
BROWARD - BROWARD COUNTY	
ENVIRONMENTAL POLICY UNIT - OFFICE OF POLICY AND BUDGET, ENVIRONMENTAL POLICY UNIT	
COMMUNITY AFFAIRS - FLORIDA DEPARTMENT OF COMMUNITY AFFAIRS	
Released Without Comment	
FISH and WILDLIFE COMMISSION - FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION	
The proposed activity may affect manatees, marine turtles, and their habitats. Commission staff will review the project during the permitting phase and provide specific recommendations to address protected species impacts at that time.	
STATE - FLORIDA DEPARTMENT OF STATE	
No Comment/Consistent	
TRANSPORTATION - FLORIDA DEPARTMENT OF TRANSPORTATION	
Staff notes that conflicts may arise between the proposed dredging project and future roadway construction of the Eller Drive Intermodal Cargo Transfer Facility (ITCF). Please coordinate project scheduling with Mr. Richard Young, Project Manager, at (954) 777-4323.	
ENVIRONMENTAL PROTECTION - FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION	
The Department notes that construction of the project would be consistent with the provisions of Rule 62B-41.005, F.A.C., regarding placement of coastal inlet sediments on downdrift beaches. However, staff requests that the USACOE provide sufficient data and analysis of the sediment cores collected in the Port Everglades Entrance Channel to demonstrate compliance with the provisions of Chapter 161, F.S., and Rule 62B-41.007, F.A.C., regarding beach compatible fill. Please see the memo provided previously by the FDEP Bureau of Beaches and Wetland Resources for further information.	
SOUTH FLORIDA WMD - SOUTH FLORIDA WATER MANAGEMENT DISTRICT	
With respect to Section 3.3.2, the EA does not address the potential effect of changes in salinity and flushing actions due to the increased channel opening from the dredging operations to the receiving waters and to potential estuarine-type habitats and species in those waters. The statements in this section regarding "the physical parameters are influenced by freshwater run-off" could be changed if the salinity levels are increased or flushing actions are altered. Even if this may be a minimal or no impact issue at this time, the EA should at least mention that salinity and flushing actions were addressed. There is a good potential over the long-term with other construction/improvement efforts in the same area that there could be substantial cumulative effects relating to salinity and flushing. If this issue is mentioned now, there is a better chance that it will continue to be mentioned and addressed for any future efforts.	

**Memorandum****Florida Department of  
Environmental Protection**

DATE: August 18, 2003

TO: Terri Jordan, Jacksonville District, U.S. Army Corps of Engineers

FROM: Roxane R. Dow, Bureau of Beaches and Wetland Resources

SUBJECT: Environmental Assessment for Maintenance Dredging the Port Everglades Entrance Channel, Broward County, Florida, dated June 2003

---

Thank you for providing via Lauren Milligan a copy of the referenced Environmental Assessment (EA). We were unable to locate any other copy.

The entrance channel at Port Everglades has been reduced in width and depth from shoaling. The Environmental Assessment was conducted to evaluate an alternative to routine maintenance dredging by the U.S. Army Corps of Engineers (Corps). The Preferred Alternative is to have Broward County dredge approximately 100,000 cubic yards of sediment from the harbor entrance channel and place the material on the beach at John U. Lloyd Beach State Park. A modification to the County's Joint Coastal Permit is contemplated to utilize the shoal as an additional source of sand. No other alternatives were evaluated. The County does have a state permit, but the federal permit has not yet been issued. An additional alternative of having the Port obtain required state and federal permits is suggested so as not to delay any further the Broward County Shore Protection Project.

Placement of shoal material on the beach would be consistent with provisions of Rule 62B-41.005, F.A.C.:

(14) All sandy sediment excavated from the coastal system shall be deposited on the adjacent beach in a location designated in the adopted inlet management plan, the adopted statewide strategic beach management plan where applicable, or in a nearshore littoral zone location approved by the Department.

(15) Any permit application for construction, excavation or maintenance of a coastal inlet and related shoals shall be consistent with the statewide strategic beach management plan for long term management of the inlet pursuant to Sections 161.142 and 161.161, F.S.

The Strategic Beach Management Plan is available at [http://www.floridadep.org/beaches/publications/gen-pub.htm#Strategic Management Plan](http://www.floridadep.org/beaches/publications/gen-pub.htm#Strategic%20Management%20Plan). The strategy for Port Everglades is:

"Place all beach compatible maintenance or offshore dredged material on the downdrift beaches in areas of greatest need to meet an annualized bypassing objective of at least 44,000 cubic yards; implement a physical monitoring program to validate or redefine the sediment budget developed in the inlet management plan; complete a feasibility study of modifications to the north jetty or other alternatives to facilitate mechanical bypassing of sand, including removal of the rock spoil located in the nearshore north of the inlet."

**Memorandum**  
**August 18, 2003**  
**Page Two**

The EA addresses turbidity, sea turtle protection and manatee protection by contemplating standard conditions and monitoring. There is insufficient information provided to assure compliance with Rule 62B-41.007 (j) and (k), F.A.C., defining beach compatibility:

(j) To protect the environmental functions of Florida's beaches, only 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 predominately of 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 existing coastal system at the disposal site and shall not contain:

1. Greater than 5 percent, by weight, silt, clay or colloids passing the #230 sieve (4.0);
2. Greater than 5 percent, by weight, fine gravel retained on the #4 sieve (-2.25);
3. Coarse gravel, cobbles or material retained on the 3/4 inch sieve in a percentage or size greater than found on the native beach;
4. Construction debris, toxic material or other foreign matter; and
5. Not 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% 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.

(k) Pursuant to subsection 62B-41.005(15), F.A.C., sandy sediment derived from the maintenance of coastal navigation channels shall be deemed suitable for beach placement with up to 10% fine material passing the #230 sieve, provided that it meets the criteria contained in (j) 2. through 5. above and water quality standards. If this material contains between 10% and 20% fine material passing the #230 sieve by weight, and it meets all other sediment and water quality standards, it shall be considered suitable for placement in the nearshore portion of the beach.

The document states that additional cores of sediments were to be collected, but does not state that sufficient analysis and reporting will be provided to demonstrate compliance with the above.

Please see that attached copy of the EA for editorial suggestions.

cc: Mike Sole  
Marty Seeling  
Paden Woodruff  
Jackie Thompson  
Robert Brantly  
Lauren Milligan



## Florida Department of Transportation

JEB BUSH  
GOVERNOR

JOSE ABREU  
SECRETARY

September 25, 2003

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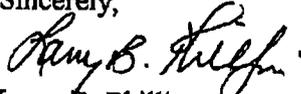
Lauren Milligan  
Clearinghouse Coordinator  
Florida State Clearinghouse  
Florida Department of Environmental Protection  
3900 Commonwealth Boulevard, Mail Station 47  
Tallahassee, Florida, 32399-3000

Re: Department of the Army - Jacksonville District Corps of Engineers  
Environmental Assessment - Maintenance Dredging, Port Everglades  
Entrance Channel, Fort Lauderdale, Broward County.  
SAI#: FL200308283720C

Dear Ms. Milligan:

The Department has reviewed the subject proposal and offer the attached comments as provided by the Florida Department of Transportation's District Four Office in Ft. Lauderdale, Broward County.

Sincerely,

  
Larry B. Phillips  
Seaport Office/FDOT

C: Terry Scheckwitz  
Sandra Whitmire  
File

LP/

# FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION



EDWIN F. ROBERTS, DC  
Pensacola

RODNEY BARRETO  
Miami

SANDRA T. KAUPE  
Palm Beach

H.A. "HERKY" HUFFMAN  
Enterprise

DAVID K. MEEHAN  
St. Petersburg

JOHN D. ROOD  
Jacksonville

RICHARD A. CORBETT  
Tampa

KENNETH D. HADDAD, Executive Director  
VICTOR J. HELLER, Assistant Executive Director

BRIAN S. BARNETT, INTERIM DIRECTOR  
OFFICE OF ENVIRONMENTAL SERVICES  
(850)488-6681 TDD (850)488-9542  
FAX (850)922-3679

October 1, 2003

Ms. Lauren Milligan  
Environmental Consultant  
Florida State Clearinghouse  
Florida Department of Environmental Protection  
3900 Commonwealth Boulevard, Mail Station 47  
Tallahassee, Florida 32399-3000

Re: SAI #FL200308283720C,  
Environmental Assessment-  
Maintenance Dredging, Port  
Everglades Entrance Channel,  
USACOE, Broward Co.

Dear Ms. Milligan:

The Office of Environmental Services of the Florida Fish and Wildlife Conservation Commission has reviewed the referenced project, and offers the following comments.

This project involves dredging a shoal in the entrance channel of Port Everglades. The shoal is approximately 100,000 cubic yards (600 ft. x 120 ft.). The shoal is located on the north side of the channel, making the depth of the shoal area -24.6 feet. The entrance channel is authorized to a depth of -45 feet. The port pilots have noted problems navigating in the north part of the channel near the end of the jetty. The type of dredge to be used and the disposal site have yet to be determined, although several alternatives are being considered.

The proposed activity may have impacts of manatees, marine turtles, and their habitats. We will have greater opportunity during the permitting phase of the proposal to get more details on the proposed dredging. At that time, we will provide specific recommendations to address potential impacts to these species and their habitat.

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Ms. Lauren Milligan  
October 1, 2003  
Page 2

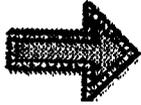
If you have any questions regarding these comments, please contact me or Ms. Carol Knox at (850) 922-4330.

Sincerely,



Brian Barnett, Interim Director  
Office of Environmental Services

BSB/CAK  
ENV 7-2-14/1  
a:\port cverglades sai.doc  
cc: USFWS-Vero Beach



Terry Scheckwitz  
09/24/2003 11:52 AM

To: Larry B Phillips/CO/FDOT@FDOT  
cc: Larry Hymowitz/D4/FDOT@FDOT, Richard Young/D4/FDOT@FDOT,  
Nancy Bungo/D4/FDOT@FDOT  
Subject: Maintenance Dredging of Port Everglades

Greetings Larry,  
District Four has reviewed the subject ICAR regarding the Department of the Army Jacksonville District Corps of Engineers (ACOE) Environmental Assessment for maintenance Dredging of Port Everglades entrance channel in Broward County.

Although the ACOE will probably not dredge and haul the material via trucks that would conflict with the future roadway construction of the Eller Drive Intermodal Cargo Transfer Facility (ITCF) project, FM # 403984, the applicant should verify the schedules for these projects so that no conflicts arise. At this time, construction of the ITCF project will not begin earlier than Fiscal Year 2007-2008, but this may change. Therefore, the schedule for this dredging effort should be coordinated with Richard Young, Project Manger, at (954) 777-4323.

Thanks,

Terry A. Scheckwitz AICP, Planning Specialist  
Intergovernmental Coordination - Office of Modal Development  
Florida Department of Transportation, District IV  
(954) 777-4651, SC 436-4651 FAX (954) 677-7892  
terry.scheckwitz@dot.state.fl.us

The city street is "the river of life...where we come together, the pathway to the center. It is the primary place."  
William H. Whyte

COUNTY: BROWARD

SAI CORPS- EA  
2003-7945

DATE: 8/27/2003

COMMENTS DUE DATE: 9/24/2003

CLEARANCE DUE DATE: 10/11/2003

SAI#: FL200308283720C

MESSAGE:

<b>STATE AGENCIES</b>	<b>WATER MNGMNT. DISTRICTS</b>	<b>OPB POLICY UNIT</b>	<b>RPCS &amp; LOC GOVS</b>
COMMUNITY AFFAIRS	SOUTH FLORIDA WMD	ENVIRONMENTAL POLICY UNIT	
ENVIRONMENTAL PROTECTION			
FISH and WILDLIFE COMMISSION			
X STATE			
TRANSPORTATION			

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BUREAU OF  
ENVIRONMENTAL PROTECTION  
03 SEP - 2 PM 7:42

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

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

Project Description:

DEPARTMENT OF THE ARMY - JACKSONVILLE  
DISTRICT CORPS OF ENGINEERS -  
ENVIRONMENTAL ASSESSMENT -  
MAINTENANCE DREDGING, PORT EVERGLADES  
ENTRANCE CHANNEL - FORT LAUDERDALE,  
BROWARD COUNTY, FLORIDA.

To: Florida State Clearinghouse

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

EO. 12372/NEPA Federal Consistency

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

From: Division of Historical Resources  
Bureau of Historic Preservation

Division/Bureau:

Reviewer: S. E. Edwards LML

Date: 9-22-03 9/22/03

NHPA - X-2003-5317

*Janet... 8/27/2003*

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

REPLY TO  
ATTENTION OF

Planning Division  
Environmental Branch

**JUN 26 2003**

TO WHOM IT MAY CONCERN:

Pursuant to the National Environmental Policy Act and U.S. Army Corps of Engineers Regulation (33 CFR 230.11), this letter references the Draft Environmental Assessment and Draft Finding of no Significant Impact for the Maintenance Dredging of the Port Everglades Entrance Channel Broward County, Florida recently mailed to your organization. The report was mailed separately.

Questions concerning the Draft Environmental Assessment (EA) should be directed to Miss Terri Jordan, Biologist, Environmental Branch, at the letterhead address, 904-232-1817, or fax 904-232-3442 within 30 days. After a 30-day comment period, the EA will be finalized.

A copy of the Draft EA and Final EA will be available from the U.S. Army Corps of Engineers upon request at the letterhead address.

Sincerely,

A handwritten signature in cursive script that reads "James C. Duck".

James C. Duck  
Chief, Planning Division



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

REPLY TO  
ATTENTION OF

Planning Division  
Environmental Branch

MAR 05 2001

TO WHOM IT MAY CONCERN:

Pursuant to the National Environmental Policy Act and the U.S. Army Corps of Engineers Regulation (33 CFR 230.12), this letter constitutes the Notice of Intent to prepare a Draft Environmental Impact Statement (DEIS) for the Port Everglades Harbor, Feasibility Study of Navigation Improvements, Fort Lauderdale, Broward County, Florida. This letter also constitutes announcement of a public scoping meeting to be held at 7 p.m., Wednesday, March 28, 2001. The public scoping meeting will be held at the Commission Chambers, in downtown Fort Lauderdale, located at 115 South Andrews Avenue. A location and vicinity map for the public scoping meeting is enclosed. The purpose of the meeting is to help to determine the scope of the EIS that will be prepared for this project. Public comments will be recorded by a Court reporter and comments may be submitted in writing for 30 days following the meeting.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosures

Coordination Act consultation procedures. Consultation will also be accomplished with the USFWS and the National Marine Fisheries Service concerning threatened and endangered species. All other necessary environmental compliance will be obtained before a Record of Decision on the EIS is signed. Other compliance requirements include a Clean Water Act Section 404(b)(1) evaluation, a Louisiana Coastal Resources Program Consistency Determination, and a State Water Quality Certification. The draft EIS or a notice of its availability will be distributed to all interested agencies, organizations, and individuals.

7. *Estimated Date of Availability.* The draft EIS is expected to be available in mid-2003.

**Gregory D. Showalter,**

*Army Federal Register Liaison Officer.*

[FR Doc. 01-7260 Filed 3-22-01; 8:45 am]

BILLING CODE 3710-84-U

## DEPARTMENT OF DEFENSE

### Department of the Army, Corps of Engineers

#### Intent To Prepare a Draft Environmental Impact Statement (DEIS) for a Feasibility Study of Navigation Improvements at Port Everglades, Broward County, FL

**AGENCY:** U.S. Army Corps of Engineers, DoD.

**ACTION:** Notice of intent.

**SUMMARY:** The Jacksonville District, U.S. Army Corps of Engineers intends to prepare a Draft Environmental Impact Statement (DEIS) for the Feasibility Study of Navigation Improvements, Port Everglades Harbor, Broward County, Florida. The study is a cooperative effort between the U.S. Army Corps of Engineers and the Broward County Department of Port Everglades.

**FOR FURTHER INFORMATION CONTACT:** Questions about the proposed action can be directed to Rea Boothby at (904) 232-3453, Environmental Branch, Planning Division, P.O. Box 4970, Jacksonville, Florida 32232-0019.

#### SUPPLEMENTARY INFORMATION:

1. *Project Background and Authorization.* Port Everglades was originally constructed by local interests between 1925-1928, and was authorized for Federal maintenance by the River and Harbor Act of 1930 and subsequent Acts.

2. *Need or Purpose.* Improvements, including channel deepening and widening, are required to accommodate

future commercial fleet and to more effectively transit the existing fleet.

3. *Proposed Solution and Forecast Completion Date.* Widen and deepen every major Federal channel and basin within the project and develop (widen and deepen) the Dania Cutoff Canal. Construction is forecast to begin around March 2003.

4. *Prior Environmental Assessments (EAs) EISs.* An EA was prepared in 1990 to accommodate dredging in the Southport access channel and Turning Notch.

5. *Alternatives.* Alternatives currently considered include no action, and 9 structural alternatives.

6. *Issues.* The EIS will consider impacts on seagrasses (including Johnson Seagrass, a threatened species), mangrove and hardbottom communities, other protected species, shore protection, health and safety, water quality, aesthetics and recreation, fish and wildlife resources, cultural resources, energy conservation, socio-economic resources, and other impacts identified through scoping, public involvement, and interagency coordination.

#### 7. *Scoping Process.*

a. A scoping letter was sent to interested parties in June 1997. In addition, all parties are invited to participate in the scoping process by identifying any additional concerns on issues, studies needed, alternatives, procedures, and other matters related to the scoping process.

b. *Public Meeting.* A public scoping meeting will be held on March 28, 2001 at 7 P.M. in the Broward County Commission Chambers located at 115 South Andrews Avenue, Ft. Lauderdale, FL. An agency scoping meeting will be held on March 29, 2001 at Port Everglades.

8. *Public Involvement:* We invite the participation of affected Federal, state and local agencies, affected Indian tribes, and other interested private organizations and parties.

9. *Coordination.* The proposed action is being coordinated with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) under Section 7 of the Endangered Species Act, with the FWS under the Fish and Wildlife Coordination Act, with the NMFS concerning Essential Fish Habitat and the State Historic Preservation Officer.

10. *Other Environmental Review and Consultation.* The proposed action would involve evaluation for compliance with guidelines pursuant to Section 404 (b) of the Clean Water Act; application (to the State of Florida) for Water Quality Certification pursuant to

Section 401 of the Clean Water Act; certification of state lands, easements, and rights of way; and determination of the Coastal Zone Management Act consistency.

11. *Agency Role.* The Corps and the non-Federal sponsor, Broward County Department of Port Everglades, will provide extensive information and assistance on the resources to be impacted, mitigation measures, and alternatives.

12. *DEIS Preparation.* It is estimated that the DEIS will be available to the public on or about September 2001.

**Gregory D. Showalter,**

*Army Federal Register Liaison Officer.*

[FR Doc. 01-7257 Filed 3-22-01; 8:45 am]

BILLING CODE 3710-AJ-U

## DEPARTMENT OF EDUCATION

### Notice of Proposed Information Collection Requests

**AGENCY:** Department of Education.

**SUMMARY:** The Leader, Regulatory Information Management Group, Office of the Chief Information Officer, invites comments on the proposed information collection requests as required by the Paperwork Reduction Act of 1995.

**DATES:** Interested persons are invited to submit comments on or before May, 22, 2001.

**SUPPLEMENTARY INFORMATION:** Section 3506 of the Paperwork Reduction Act of 1995 (44 U.S.C. chapter 35) requires that the Office of Management and Budget (OMB) provide interested Federal agencies and the public an early opportunity to comment on information collection requests. OMB may amend or waive the requirement for public consultation to the extent that public participation in the approval process would defeat the purpose of the information collection, violate State or Federal law, or substantially interfere with any agency's ability to perform its statutory obligations. The Leader, Regulatory Information Management Group, Office of the Chief Information Officer, publishes that notice containing proposed information collection requests prior to submission of these requests to OMB. Each proposed information collection, grouped by office, contains the following: (1) Type of review requested, e.g. new, revision, extension, existing or reinstatement; (2) Title; (3) Summary of the collection; (4) Description of the need for, and proposed use of, the information; (5) Respondents and frequency of collection; and (6) Reporting and/or

scheduled a public meeting of its Scientific and Statistical Committee (SSC) and Social Sciences Advisory Committee (SSAC) in November, 1999. The SSC meeting days were incorrectly listed in the October 20, 1999 Federal Register notice. There has also been an addition to the SSC meeting agenda. The October 20, 1999 Federal Register notice also did not include the meeting location of the SSAC meeting.

**DATES:** The meeting for the SSC will be held on Thursday, November 4, 1999, at 10 a.m. and Friday, November 5, 1999, at 8:30 a.m. The meeting for the SSAC will be held on Friday, November 5, 1999, at 10 a.m.

**ADDRESSES:** See **SUPPLEMENTARY INFORMATION** for location of the SSAC meeting.

**FOR FURTHER INFORMATION CONTACT:** Paul J. Howard, Executive Director, New England Fishery Management Council (781) 231-0422.

**SUPPLEMENTARY INFORMATION:** The New England Fishery Management Council's SSC and SSAC notice of public meetings was published in the Federal Register on October 20, 1999 (64 FR 56487).

The original notice stated that the SSC meeting would be held on Monday, November 4, 1999. The correct date should read Thursday, November 4, 1999.

In addition to the agenda items in the original meeting notice, the SSC will receive a presentation on the scientific basis of management measures in the joint Mid-Atlantic/New England Fishery Management Council Monkfish Fishery Management Plan. No formal action will be taken at this meeting on the information presented.

Friday, November 5, 1999, 10 a.m.—SSAC Meeting

Location was omitted and should read as follows: Holiday Inn, One Newbury Street, Route 1, Peabody, MA; telephone: (978) 535-4600.

All other information previously published remains unchanged.

Dated: October 25, 1999.

**Richard W. Surdi,**

*Acting Director, Office of Sustainable Fisheries, National Marine Fisheries Service.*

[FR Doc. 99-28275 Filed 10-28-99; 8:45 am]

**BILLING CODE 3510-22-F**

## DEPARTMENT OF COMMERCE

### National Oceanic and Atmospheric Administration

[I.D. 101599B]

#### Marine Mammals

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Issuance of photography permit no. 867-1525

**SUMMARY:** Notice is hereby given that Moana Productions, Inc., 311 Portlock Road, Honolulu, Hawaii 96825, has been issued a permit to take by Level B harassment several species of non-threatened, non-endangered marine mammals for purposes of commercial photography.

**ADDRESSES:** The permit and related documents are available for review upon written request or by appointment in the following offices:

Permits Division, Office of Protected Resources, NMFS,

1315 East-West Highway, Room 13130, Silver Spring, MD 20910 (301/713-2289);

Regional Administrator, Southwest Region, NMFS, 501 West Ocean Boulevard, Suite 4200, Long Beach, CA 90802-4213

(310/980-4001);

Regional Administrator, Northwest Region, NMFS, 7600 Sand Point Way NE, Bin C15700, Building 1, Seattle, WA 98115-0070 (206/526-6150); and

Regional Administrator, Alaska Region, 709 W. 9<sup>th</sup> Street, Federal Building Room 461, P.O. Box 21668, Juneau, AK 99802 (907/586-7235).

**SUPPLEMENTARY INFORMATION:** On September 7, 1999, notice was published in the **Federal Register** (64 FR 48607) that the above-named applicant had submitted a request for a permit to take several species of marine mammals by Level B harassment during the course of commercial photographic activities in Hawaii and South Carolina waters. The requested permit has been issued, under the authority of § 104(c)(6) of the Marine Mammal Protection Act of 1972, as amended (16 U.S.C. 1361 *et seq.*).

Dated: October 22, 1999.

**Ann D. Terbush,**

*Chief, Permits and Documentation Division, Office of Protected Resources, National Marine Fisheries Service.*

[FR Doc. 99-28424 Filed 10-28-99; 8:45 am]

**BILLING CODE 3510-22-F**

## CONSUMER PRODUCT SAFETY COMMISSION

### Sunshine Act Meeting

**AGENCY:** U.S. Consumer Product Safety Commission, Washington, DC 20207.

**TIME AND DATE:** Tuesday, November 9, 1999, 10:00 a.m.

**LOCATION:** Room 420, East West Towers, 4330 East West Highway, Bethesda, Maryland.

**STATUS:** Open to the public.

**MATTER TO BE CONSIDERED:**

#### Hydrocarbons

The staff will brief the Commission on options concerning whether the Commission should issue a proposed rule to require child-resistant packaging for low-viscosity liquid hydrocarbons.

For a recorded message containing the latest agenda information, call (301) 504-0709.

#### CONTACT PERSON FOR ADDITIONAL

**INFORMATION:** Sadye E. Dunn, Office of the Secretary, 4330 East West Highway, Bethesda, MD 20207 (301) 504-0800.

Dated: October 27, 1999.

**Sadye E. Dunn,**

*Secretary.*

[FR Doc. 99-28548 Filed 10-27-99; 3:36 pm]

**BILLING CODE 6355-01-M**

## DEPARTMENT OF DEFENSE

### Department of the Army, Corps of Engineers

#### Intent To Prepare a Draft Environmental Impact Statement (DEIS) for the Broward County Beach Erosion Control Project in Broward County, FL

**AGENCY:** U.S. Army Corps of Engineers, Department of Defense.

**ACTION:** Notice of intent.

**SUMMARY:** The Jacksonville District, U.S. Army Corps of Engineers intends to prepare a Draft Environmental Impact Statement for construction of appropriate reaches of Segments II (Hillsboro Inlet to Port Everglades) and III (Port Everglades to South County Line) of the Broward County Beach Erosion Control Project. The Project is a cooperative effort between the U.S. Army Corps of Engineers (lead Federal agency) and Broward County Department of Planning and Environmental Protection (cooperating agency).

**FOR FURTHER INFORMATION CONTACT:** Kenneth Dugger, 904-232-1686, Environmental Branch, Planning

Division, P.O. Box 4970, Jacksonville, Florida 32232-0019.

**SUPPLEMENTARY INFORMATION:** The Broward County, Florida, Beach Erosion Control and Navigation Project was authorized by Public Law (Pub. L.), Public Works—River and Harbor (79 Stat. 1073) passed 27 October 1965 in accordance with the recommendations of the Chief of Engineers in House Document 91, 89th Congress. Authorization for periodic beach nourishment of the Project was extended to 50 years from the date of original construction by Section 506(a)(1) of the Water Resources Development Act of 1996. The Project will involve placement of approximately 3.5 million cubic yards of material along 17.35 miles of Broward County's coastline. The authorized Project includes two segments. In Segment II (Hillsboro Inlet to Port Everglades), fill will be placed along beaches in southern Pompano Beach, Lauderdale-By-The-Sea, and northern and central Fort Lauderdale. In Segment III (Port Everglades to the south County line), fill will be placed along the entire segment, including John U. Lloyd Beach State Recreation Area, Dania Beach, Hollywood, and Hallandale Beach. Fill will be obtained from seven discrete borrow areas located offshore of the central and northern portion of the County. Previous beach fill construction, totaling approximately twelve miles of beach length, has occurred twice in Segment II (Pompano Beach/Lauderdale-By-The-Sea in 1970 and 1983) and twice each in two areas of Segment III (John U. Lloyd Beach State Recreation Area in 1976 and 1989, and Hollywood/Hallandale in 1979 and 1991). Authorization for Federal participation in periodic beach nourishment of Segment II expires in 2020 and in Segment III in 2030.

**Alternatives:** Alternatives considered include no action, continued nourishment of previously restored areas, initial restoration of previously unconstructed areas, modifications to beach fill amounts, widths, elevations, and/or extent, construction of groins and/or breakwaters, and beach fill/groin combination. Alternative sand sources in addition to the use of a borrow area for nourishment, include the use of other sand sources such as upland sources, Bahamian sand, other foreign sands, or other distant sources.

**Issues:** The EIS will consider impacts on coral reefs and other hardbottom communities, protected species, shore protection, health and safety, water quality, aesthetics and recreation, fish and wildlife resources, cultural

resources, energy conservation, socio-economic resources, and other impacts identified through scoping, public involvement, and interagency coordination.

**Scoping:** The scoping process will involve Federal, State, County and municipal agencies and other interested persons and organizations. A scoping letter will be sent to interested organizations and individuals and to Federal, State, County, and municipal agencies, requesting their comments and concerns.

**Public Involvement:** We invite the participation of affected Federal, State and local agencies, affected Indian tribes, and other interested private organizations and parties. At this time, we have no plans to hold a public scoping meeting.

**Coordination:** The proposed action is being coordinated with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service under Section 7 of the Endangered Species Act, with the FWS under the Fish and Wildlife Coordination Act, and with the State Historic Preservation Officer.

**Other Environmental Review and Consultation:** The proposed action would involve evaluation for compliance with guidelines pursuant to Section 404(b) of the Clean Water Act; application (to the State of Florida) for Water Quality Certification pursuant to Section 401 of the Clean Water Act; certification of state lands, easements, and rights of way; and determination of Coastal Zone Management Act consistency.

**Agency Role:** As cooperating agency, non-Federal sponsor, and leading local expert; The Broward County Department of Planning and Environmental Protection, Biological Resources Division, will provide extensive information and assistance on the resources to be impacted, mitigation measures, and alternatives.

**DEIS Preparation:** It is estimated that the DEIS will be available to the public by January 2000.

Dated: October 1, 1999.

**James C. Duck,**

*Chief, Planning Division.*

[FR Doc. 99-28308 Filed 10-28-99; 8:45 am]

BILLING CODE 3710-AJ-M

## DEPARTMENT OF DEFENSE

### Department of the Navy

#### Public Hearing for the Draft Environmental Impact Statement (DEIS) for the Transfer and Reuse of Naval Weapons Industrial Reserve Plant (NWIRP), Bethpage, NY

**AGENCY:** Department of the Navy, DOD.  
**ACTION:** Notice.

**SUMMARY:** The Department of the Navy has prepared and filed with the U.S. Environmental Protection Agency (EPA) a DEIS for the transfer and reuse of NWIRP Bethpage, New York. A public hearing will be held for the purpose of receiving oral and written comments on the DEIS. Federal, state and local agencies, and interested individuals are invited to be present or represented at the hearing.

**DATES:** The public hearing will be held on November 18, 1999, beginning at 7:00 p.m.

**ADDRESSES:** The meeting will be held at the Bethpage High School, Cherry Street, Bethpage, New York.

**FOR FURTHER INFORMATION CONTACT:** Mr. Robert Ostermueller (Code 202) at Northern Division, Naval Facilities Engineering Command, 10 Industrial Highway, Lester, Pennsylvania 19113, telephone (610) 595-0759, facsimile (610) 595-0778).

**SUPPLEMENTARY INFORMATION:** Pursuant to section 102(2)(C) of the National Environmental Policy Act (NEPA) of 1969, as implemented by the Council on Environmental Quality regulations (40 CFR parts 1500-1508), the Department of the Navy has prepared and filed with the EPA a DEIS for the transfer and reuse of NWIRP Bethpage, New York. A Notice of Intent for this DEIS was published in the **Federal Register** on March 8, 1999 and a public scoping meeting was held in Bethpage, New York, on March 23, 1999.

The proposed action is the U.S. Navy's transfer of the NWIRP Bethpage to the County of Nassau, New York. The transfer of NWIRP Bethpage was authorized by the Department of Defense Authorization Act for fiscal year 1998. The legislation authorizes the Secretary of the Navy to convey NWIRP Bethpage to Nassau County, New York for economic redevelopment purposes or such other public purposes. The NWIRP Bethpage property consists of two non-contiguous land parcels encompassing approximately 109.5 acres and an individual building (Plant 5) located within the former 605-acre Northrop Grumman manufacturing campus in the hamlet of Bethpage,

Regulatory Division  
South Permits Branch

## ***PUBLIC NOTICE***

Permit Application No. 199905545(IP-DSG)

TO WHOM IT MAY CONCERN: This district has received an application for a Department of the Army permit pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403), and Section 404 of the Clean Water Act as described below:

APPLICANT: Broward County  
218 SW. 1<sup>st</sup> Avenue  
Ft. Lauderdale, Florida 33301

WATERWAY & LOCATION: The project is located in the Atlantic Ocean , from DNR reference monuments R-34 to R-74 (Segment II) and R-86 to R-128 (Segment III), in Section 31, Township 48 south, Range 43 east, Sections 5, 7, 18, 19, 30, Township 49 South, Range 43 east, Sections 6 and 7, Township 50 south, Range 43 east, Sections 24, 25, and 36, Township 50 south, Range 42 east, and Sections 1, 12, 13, 24, 25, and 25, Township 51 south, Range 42 east, Pompano Beach, Lauderdale-by-the-Sea, Ft. Lauderdale, John U. Lloyd Beach State Recreation Area, Dania, Hollywood, and Hallandale, Broward County, Florida.

LATITUDE & LONGITUDE:

Northern Limit: Latitude 26°14'4.8"North  
Longitude 80°5'21.3"West

Southern Limit: Latitude 25°58'30.6"North  
Longitude 80°7'6.8"West

WORK & PURPOSE: The applicant proposes a beach renourishment in accordance with the Broward County Shore Protection Project. The proposed project includes the restoration and stabilization of

approximately 63,000 feet (11.9 miles) of beach shoreline along various beaches in Broward County. Information regarding the **renourishment** of the beach is located within the table below:

	<b>Segment II</b>	<b>Segment III</b>
<b>Length of beach</b>	27,000feet (5.1 miles)	36,000 feet (6.8 miles)
<b>cubic yards of sand</b>	1.8 million cubic yards	2.2 million cubic yards
<b>berm height</b>	+9 feet NGVD	+9 feet NGVD
<b>foreshore slope</b>	1V:10H	1V:10H
<b>nearshore slope</b>	1H:30H	1V:30H @ John U. Lloyd Park & 1V:45H @ Hollywood & Hallendale
<b>total impacts to seagrasses</b>	NONE	NONE
<b>total impacts to nearshore hardbottoms</b>	12.1 acres	25 acres
<b>Location of hardbottoms</b>	Pompano Beach & Lauderdale-by-the-Sea	John U. Lloyd State Park Hollywood/Hallendale
<b>number of groins</b>	NONE	11

In Segment III, the applicant also proposes to construct a groin field located in the northern 3,000 feet of the segment. The groins would front the John U. Lloyd Beach State Recreation Area from DNR reference monuments R-86 to R-89. Eleven groins are proposed for construction: 10 would be T-shaped and one would be a spur attached to the Port Everglades' south jetty.

The spur attached to the jetty would be approximately 100 feet long and approximately 40 feet wide. The T-shaped groin located adjacent to the Naval Surface Warfare Center at DNR reference monument R-86 would be approximately 110 feet long with the "T" being 180 feet long. All other T-shaped groins would be approximately 150 feet long with the "T" varying in length from 80 feet to 170 feet.

The applicant proposed to utilize seven offshore **borrow areas** located between DNR reference monuments R-1 to R-50. Material would be obtained from the borrow sites by hopper dredge due to the presence of rubble. Rock and shell greater than 1 inch in diameter would be filtered out and disposed at two previously permitted deep artificial reef areas: the John U. Lloyd rock disposal site and the Deerfield rock disposal site. The John U. Lloyd disposal site is located approximately 10,370 feet offshore from Hollywood Beach and the Deerfield disposal site is located approximately 11,150 feet offshore from Deerfield Beach. The following table identifies location (latitude and longitude values and distance offshore), the mean grain size, and silt/clay percentage for each of the seven borrow areas (BA):

	<b>Northern Limit</b>	<b>Southern Limit</b>	<b>Distance offshore (Feet)</b>	<b>Mean Grain Size</b>	<b>Silt/Clay Content</b>
<b>BA I</b>	26°19'18.2" 80°4'10.5"	26°18'32.9" 80°4'19.3"	1200	0.36mm	1.69%
<b>BA II</b>	26°17'39.4" 80°4'21.2"	26°15'46.2" 80°4'29.6"	1290	0.31mm	1.66%
<b>BA III</b>	26°16'57.7" 80°4'3.1"	26°16'21.4" 80°4'4.4"	3328	0.41mm	4.59%
<b>BA IV</b>	26°14'45.6" 80°4'36.4"	26°14'20.1" 80°4'36.5"	3100	0.32mm	2.36%
<b>BA V</b>	26°12'50.9" 80°4'31.6"	26°12'24.3" 80°4'34.3"	4800	0.25mm	6.85%
<b>BA VI</b>	26°11'57.5" 80°4'55.1"	26°11'36.7" 80°4'55.4"	3800	0.41mm	2.62%
<b>BA VII</b>	26°12'0" 80°4'38.8"	26°11'25.3" 80°4'39.6"	5500	0.42mm	3.34%

RESOURCES OF SPECIAL CONCERN: Based upon the information available from the applicant and utilization of "Manatee Key 1" dated February 1997, the U.S. Army Corps of Engineers (Corps) determined the project would may affect, but not likely adversely affect the West Indian manatee, provided the standard manatee construction precautions are followed.

Marine sea turtles may utilize the beaches of Broward County for nesting and may be in the waters of the Broward County coast. The Corps has determined the project would may affect, but not

likely adversely affect these species. The applicant wishes to work during turtle nesting season.

Project site information will also be forwarded to the State Historical Preservation Office to be reviewed for the presence of any resources listed, or eligible for listing in the *National Register of Historic Places*.

This notice initiates consultation on Essential Fish Habitat (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act. The proposed project impacts of 37.1 acres is considered essential habitat for Federally managed fisheries and associated species as identified by the South Atlantic Fishery Management Council. The beach renourishment activity would impact non-vegetated bottoms and nearshore hardbottoms, which could have an impact on shrimp, red drum, reef fish, stone crab, spiny lobster, coral and reefs, migratory/pelagic fish, snapper, grouper, and golden crab. Dredging at the borrow areas would impact non-vegetated bottoms, which could have an impact on shrimp, red drum, reef fish, stone crab, spiny lobster, migratory/pelagic fish, snapper, and grouper. Our initial review of the proposal indicates it will have impacts on essential habitat. Our final determination of impacts and appropriate mitigation requirements will be made after additional consultation with the National Marine Fisheries Service.

NOTE: This public notice is being issued based on information furnished by the applicant. This information has not been verified. There are approximately 74 pages of project drawings. In the interest of cost, the number of drawings included in this public notice was limited to 10. All of the drawings are available upon request. In addition, a copy of the application is also being made available at our West Palm Beach Office.

AUTHORIZATION FROM OTHER AGENCIES: Water Quality Certification is required from the State Department of Environmental Protection (DEP). The application number for the DEP is 0163435-001-JC.

Comments regarding the application should be submitted in writing to the District Engineer at the above address within 30 days from the date of this notice.

If you have any questions concerning this application, you may contact Dianne S. Griffin of this office, telephone 904-232-3697, fax 904-232-1684.

Additional Mailing Labels  
for  
199905545(IP-DSG)

Mr. Doug Mann  
Coastal Planning & Engineering, Inc.  
2481 NW. Boca Raton Boulevard  
Boca Raton, Florida 33431

Broward County  
Attention: Mr. Stephen H. Higgins  
218 SW. 1<sup>st</sup> Avenue  
Fort Lauderdale, Florida 33301

Irwin H. & Dorothy V. Crouppen  
3430 Galt Ocean Drive, Apt. #1506  
Ft. Lauderdale, Florida 33308

see list of adjacent property owners included in Section 3 of the  
submitted permit application



FT. LAUDERDALE

1

DANIA

HOLLYWOOD

HALLANDALE

PORT EVERGLADES

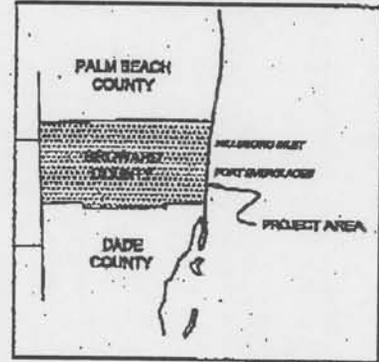
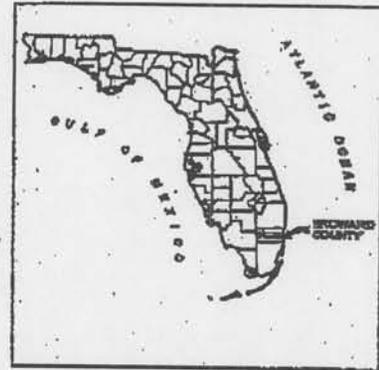
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JOHN U. LLOYD SEGMENT

DANIA GAP SEGMENT

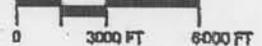
HOLLYWOOD / HALLANDALE SEGMENT

BROWARD CO. DISTRICT



ATLANTIC OCEAN

GRAPHIC SCALE (APPROX.)



olsen associates, inc. 4438 Herschel Street Jacksonville, FL 32210 (904) 387-6114 (Fax) 384-7368

BROWARD COUNTY SHORE PROTECTION PROJECT SEGMENT III

PROJECT LOCATION

US ARMY CORPS OF ENGINEERS APPLICATION # 199905545 (IP-DSG) DATE..... April 2000 DRAWING PAGE 1 OF 9

Flood → Ebb

# PORT EVERGLADES INLET

E 950000



NAVAL SURFACE WARFARE CENTER

South Jetty

PROPOSED SPUR

PROPOSED GROIN (TYP.)

R-87

CCCL

ECL

John U. Lloyd Beach State Recreation Area

R-88

LANDWARD LIMIT OF CONSTRUCTION BERM (APPROX.)

N 638000

SEAWARD LIMIT OF CONSTRUCTION BERM (APPROX.)

TOE OF CONSTRUCTION BERM (APPROX.)

R-89

PREDICTED TOE OF EQUILIBRATED FILL (APPROX.)

R-90

LANDWARD LIMIT OF NEARSHORE HARDBOTTOM (7/89)

BROWARD COUNTY  
TWP 50, RNG 42  
SEC. 24

MATCHLINE "A"

SCALE



0 300 600 FEET

NOT FOR PURPOSES OF CONSTRUCTION

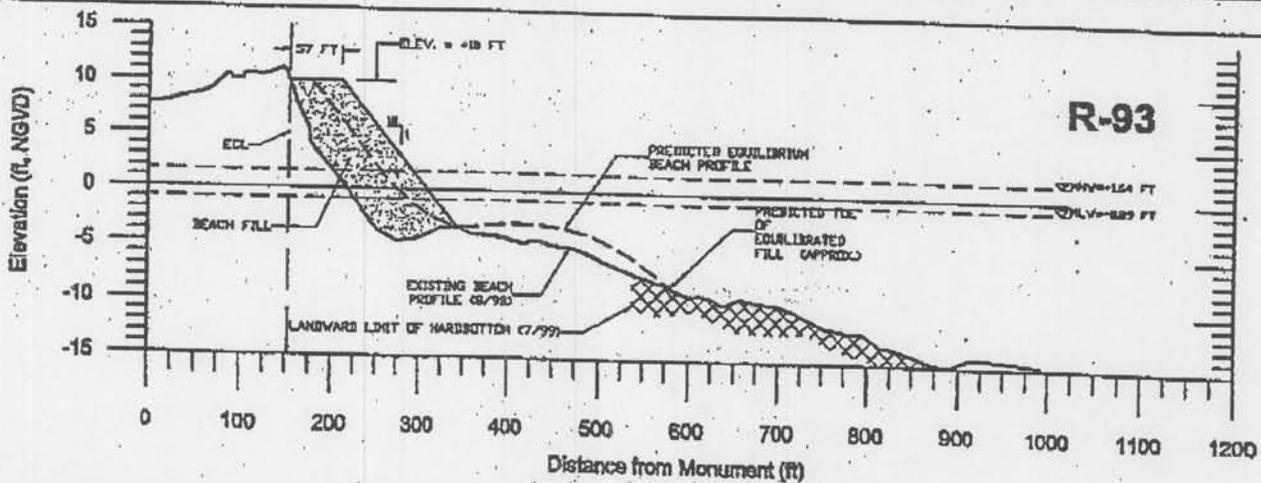
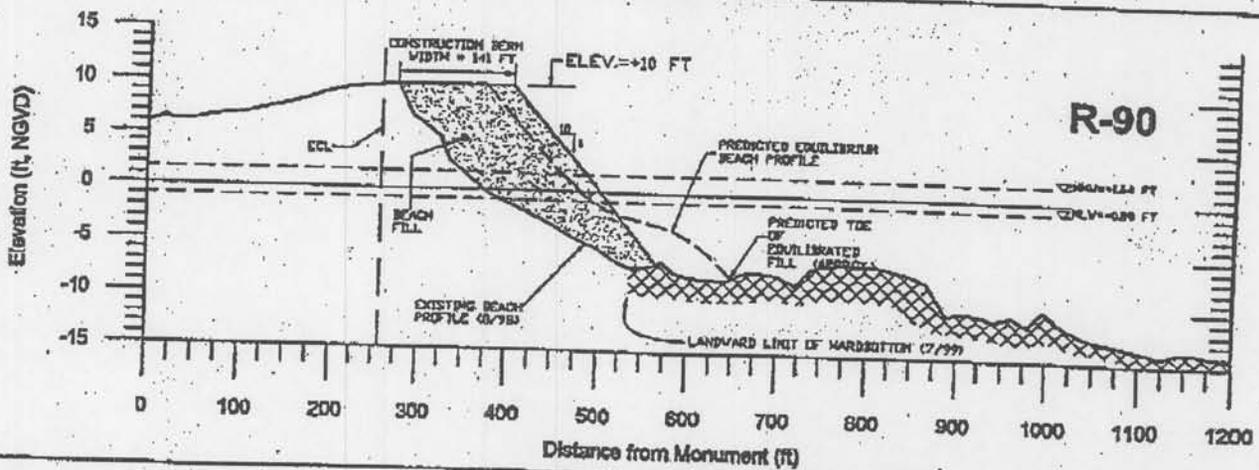
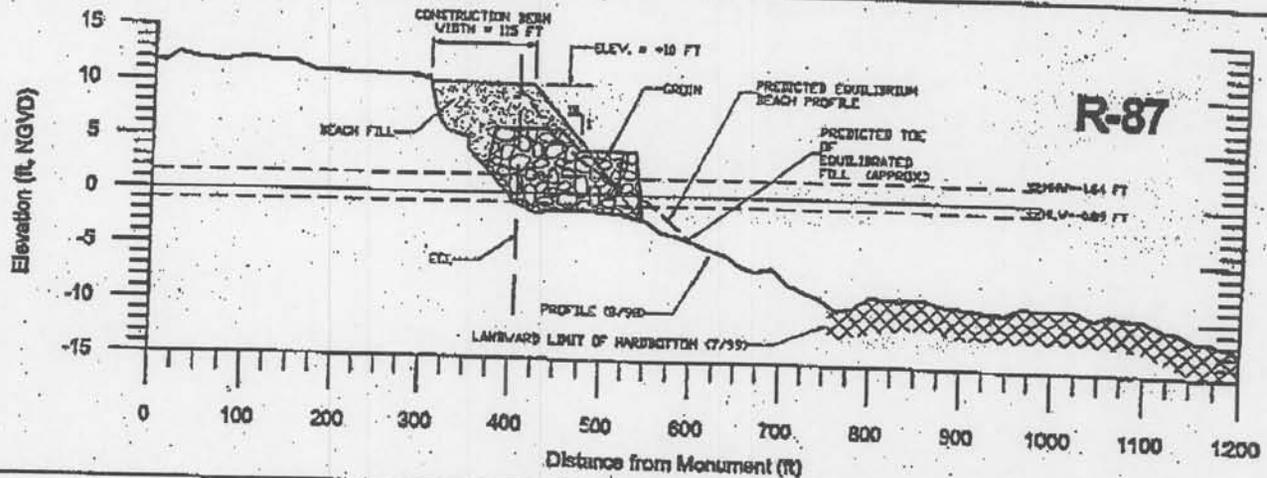
A.I.W.L.A.

**olsen**  
associates, inc.  
4438 Herschel Street  
Jacksonville, FL 32210  
(904) 387-6114

BROWARD COUNTY SHORE PROTECTION PROJECT  
SEGMENT III

ACH FILL AREA (PLANFORM)

US ARMY CORPS OF ENGINEERS  
APPLICATION # 199905545 (I.P.D.S.)  
DATE..... Apr 2000  
DRAWING PAGE 2 OF 9



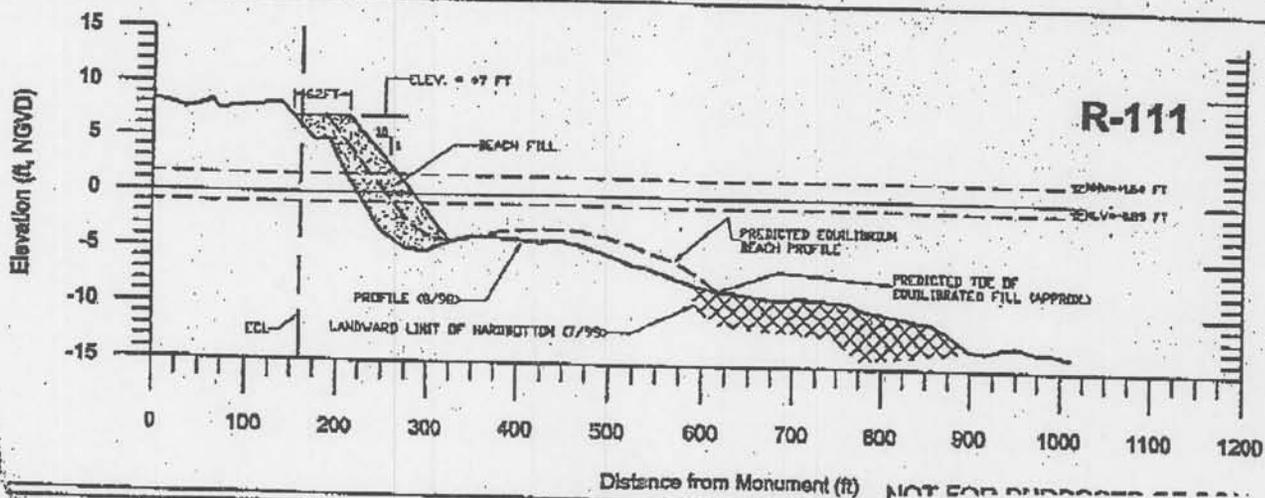
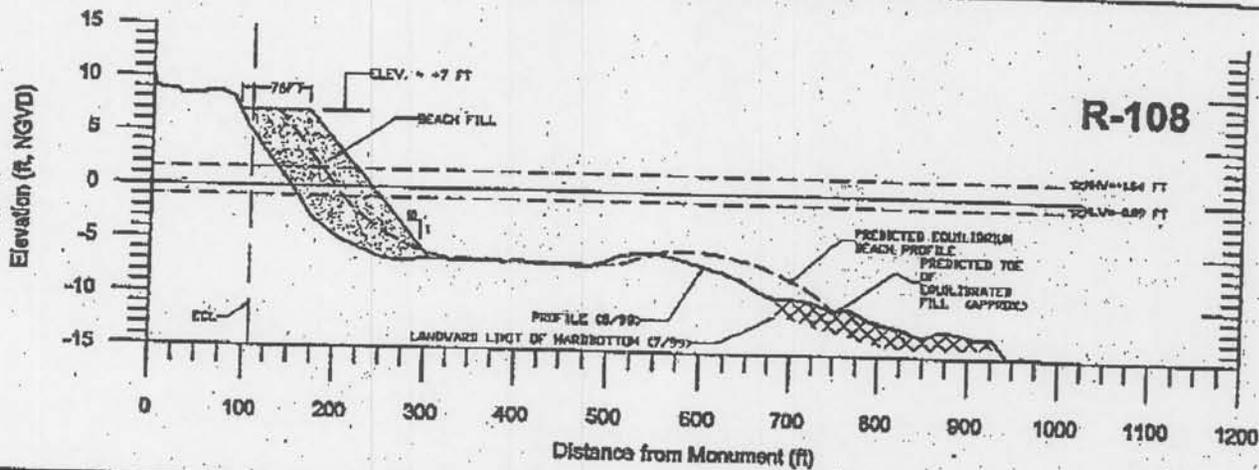
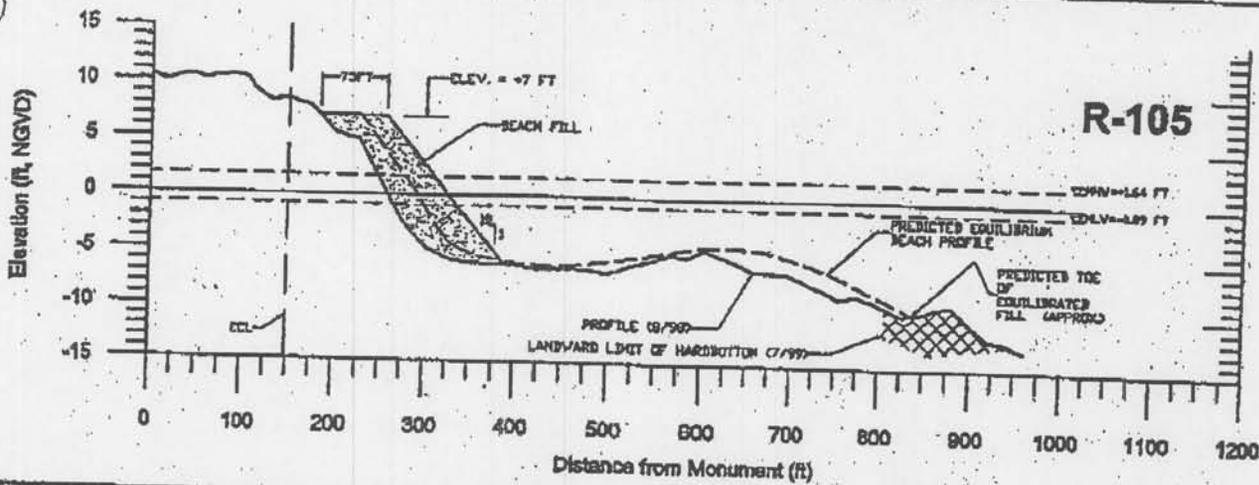
NOT FOR CONSTRUCTION



**olsen**  
 associates, inc.  
 4438 Herschel Street  
 Jacksonville, FL 32210  
 (904) 387-6114  
 FAX 904 387-7300

BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
**TYPICAL BEACH FILL**  
 DESIGN SECTIONS

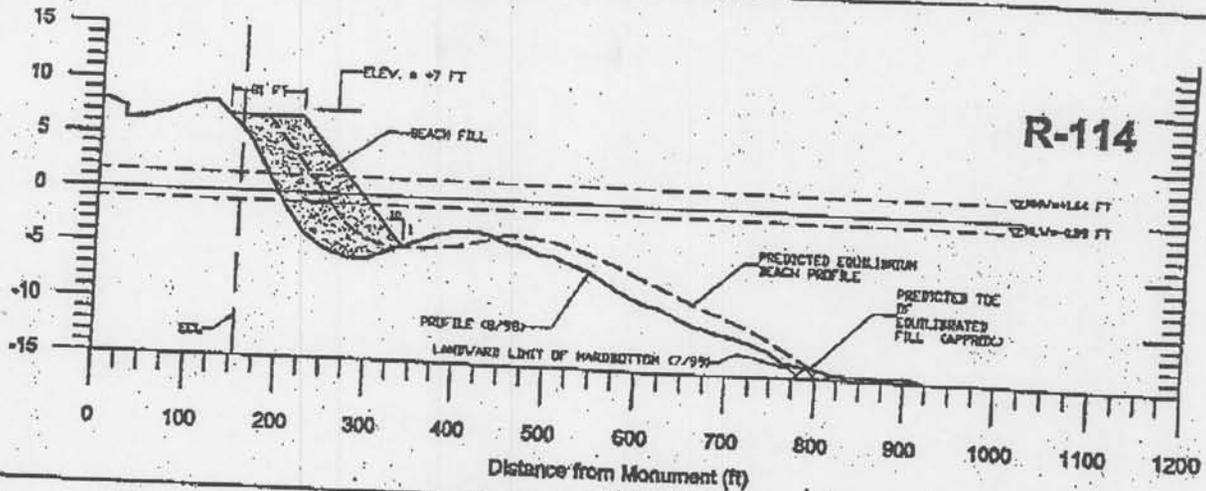
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 APPLICATION # 199705545 (DP-286)  
 DATE APRIL 2000  
 DRAWING PAGE 3 OF 9



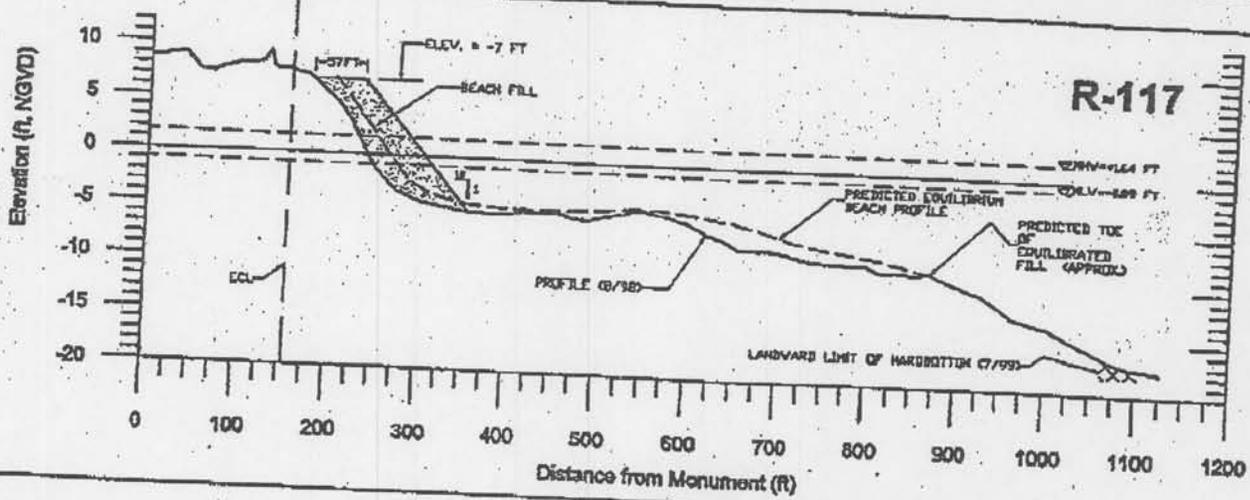
**olsen**  
 associates, inc.  
 4438 Herschel Street  
 Jacksonville, FL 32210  
 (904) 387-6114

BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
**PICAL BEACH FILL**

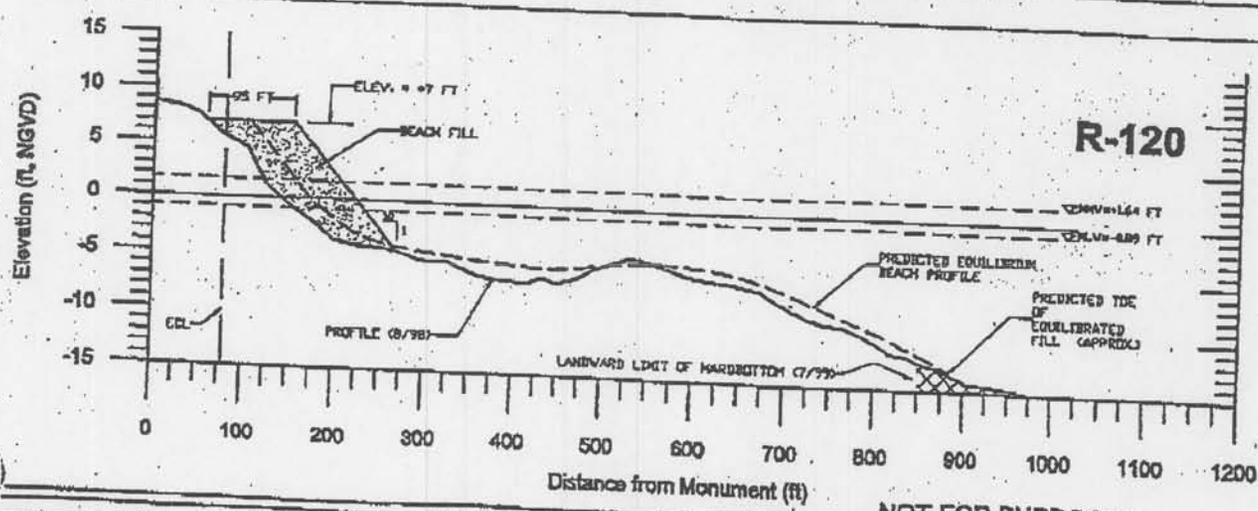
US ARMY CORPS OF ENGINEERS  
 APPLICATION # 199905515 (IP-256)  
 DATE..... APR 2000  
 DRAWING PAGE 4 OF 9



R-114



R-117

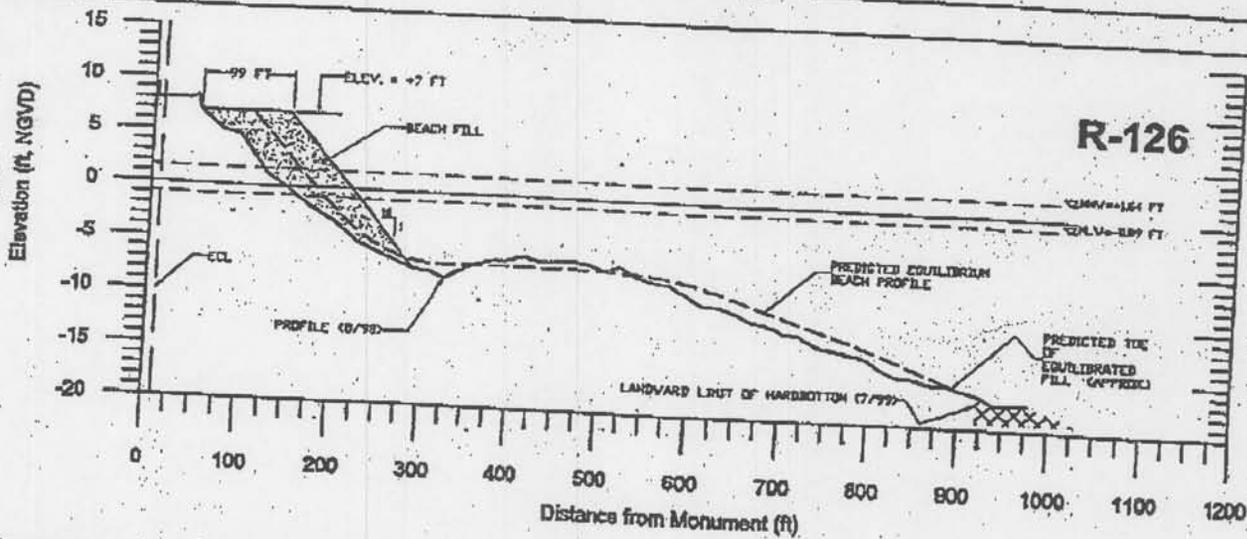
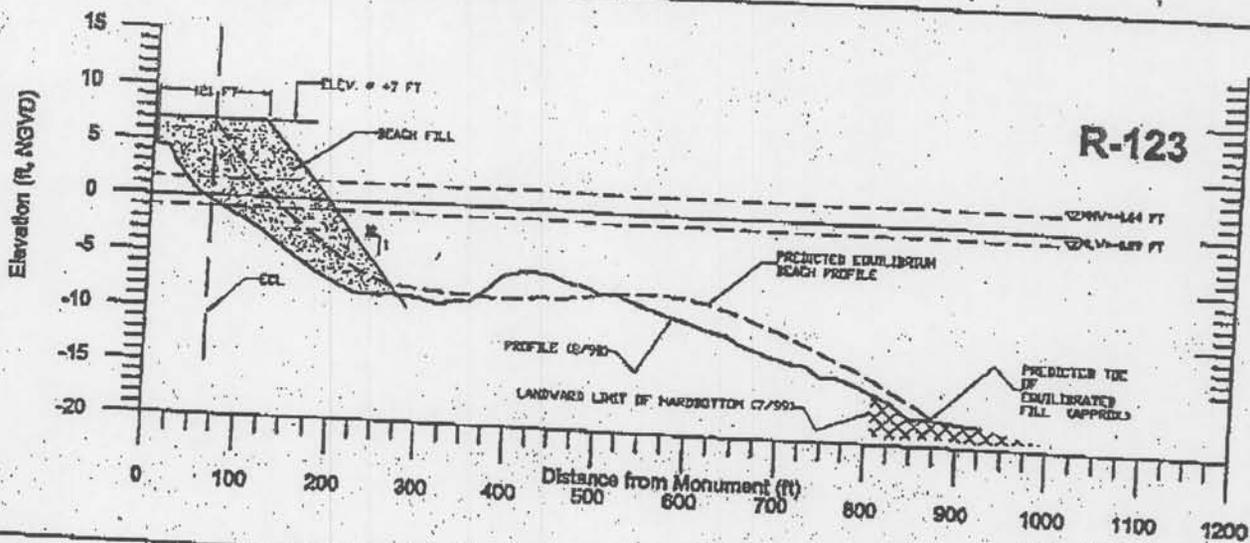


R-120

**olsen**  
 associates, inc.  
 4438 Herschel Street  
 Jacksonville, FL 32210  
 (904) 387-6114  
 (Fax) 384-7368

BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
 TYPICAL BEACH FILL  
 DESIGN SECTIONS

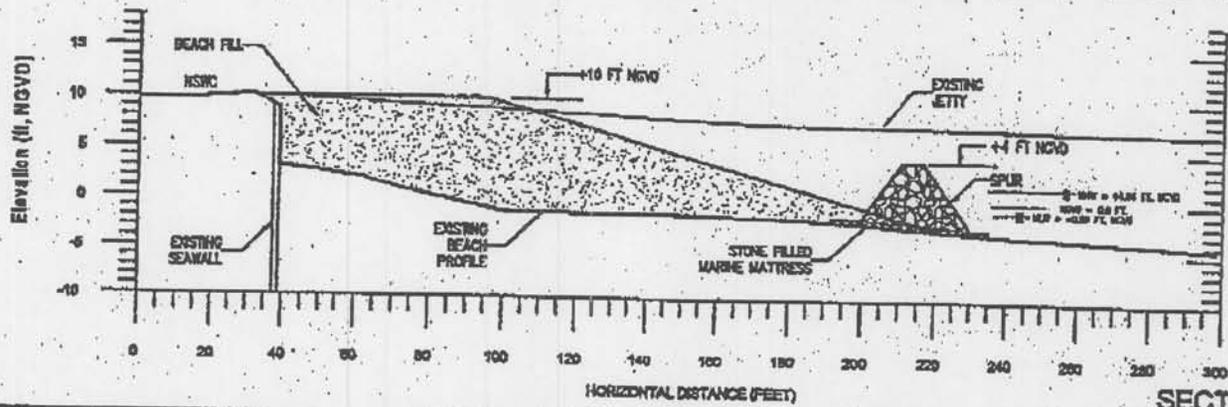
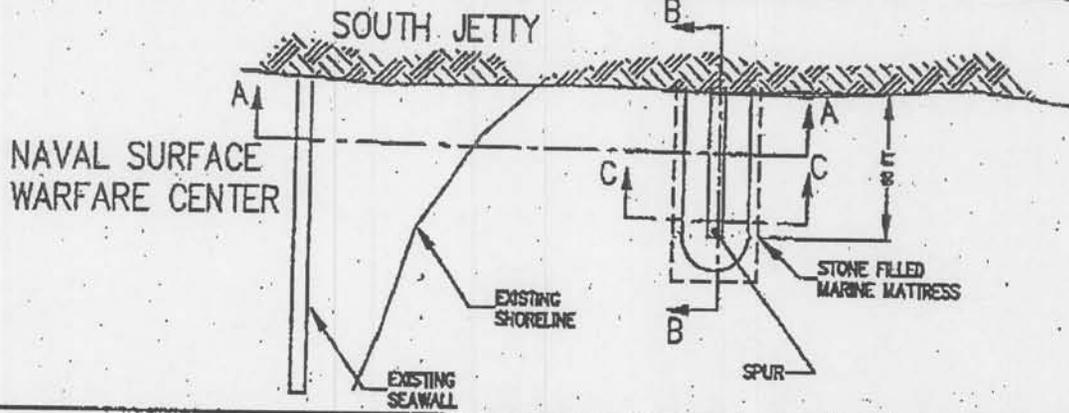
US ARMY CORPS OF ENGINEERS  
 APPLICATION # 199905545 (IP-D5G)  
 DATE..... APRIL 2000  
 DRAWING PAGE 5 OF 9



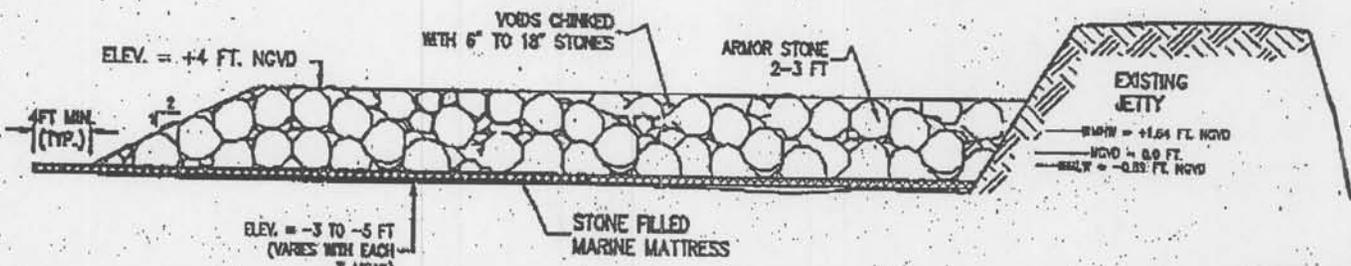
**olsen**  
 associates, inc.  
 4438 Herschel Street  
 Jacksonville, FL 32210  
 (804) 387-6114  
 (Fax) 384-7388

BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
 BEACH FILL  
 DESIGN SECTIONS

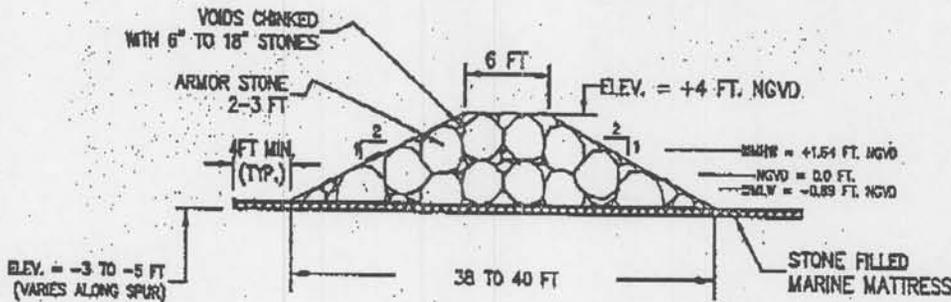
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 APPLICATION # 199905545 (TP-DSG)  
 DATE APR 2000  
 DRAWING PAGE 6 OF 9



SECTION A-A



SECTION B-B

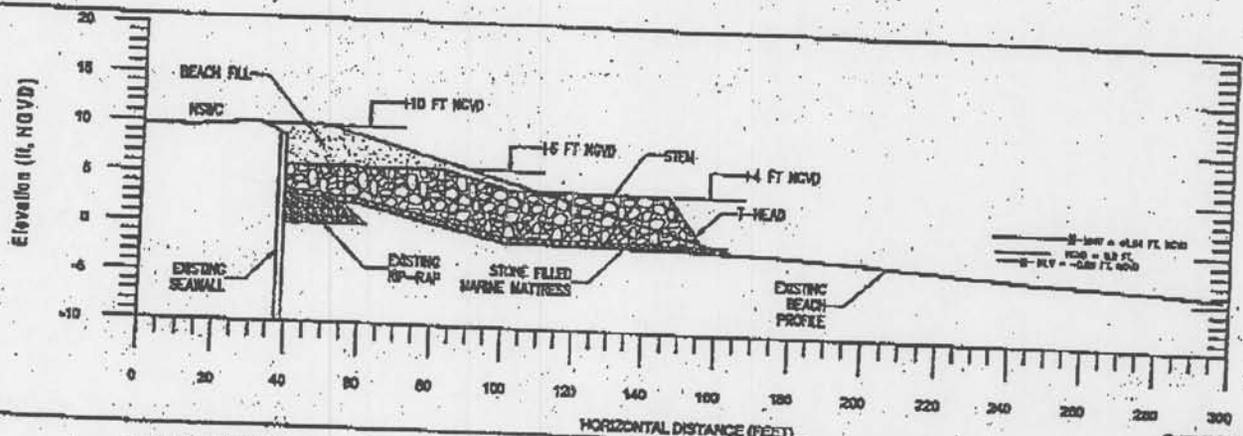
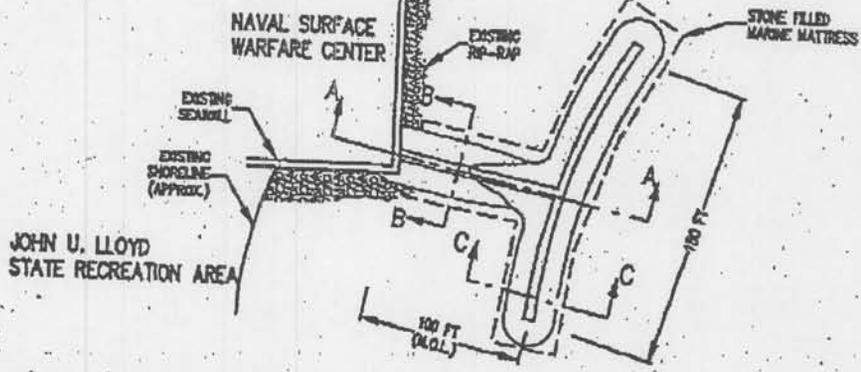


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 4438 Herschel Street  
 Jacksonville, FL 32210  
 (904) 387-8114

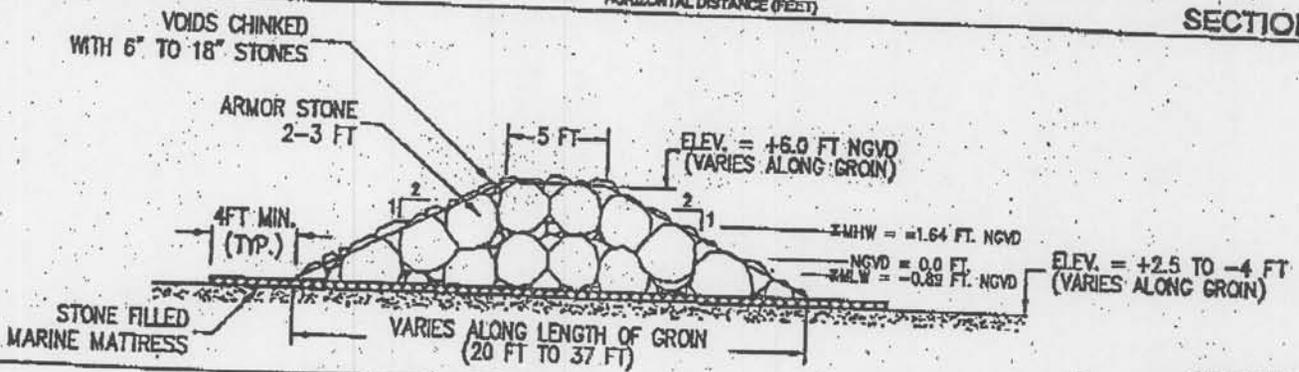
BROWARD COUNTY SHORE PROTECTION PROJ  
 SEGMENT III

JETTY SPUR DETAIL C

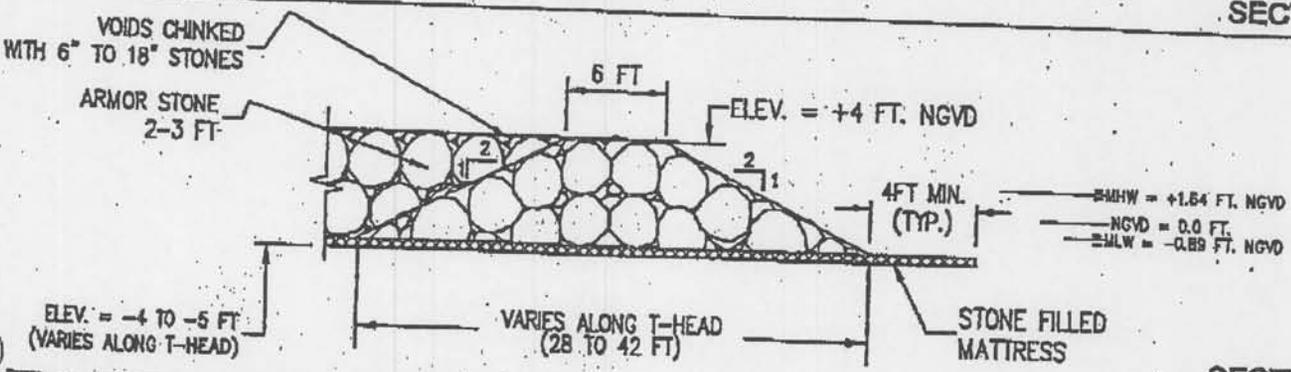
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 APPLICATION # 199905545 (IP-256)  
 DATE..... APRIL 2000  
 DRAWING PAGE 7 OF 9



SECTION A



SECTION B

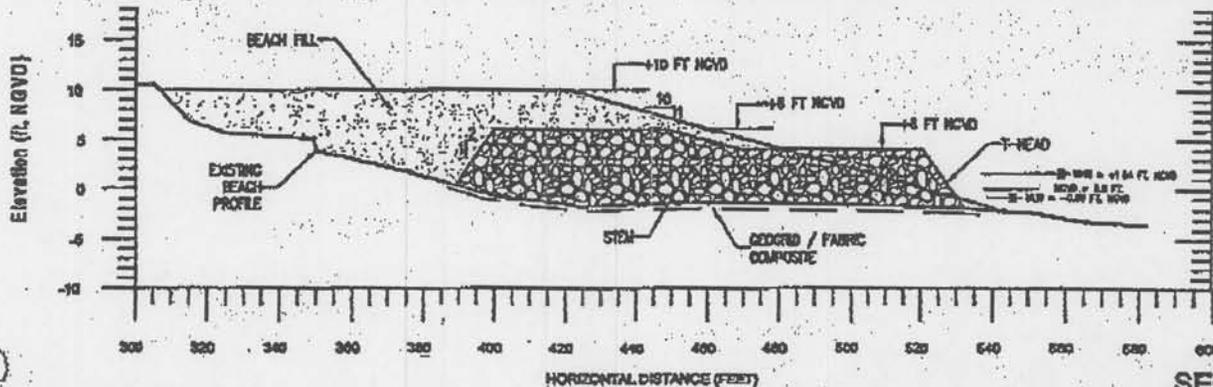
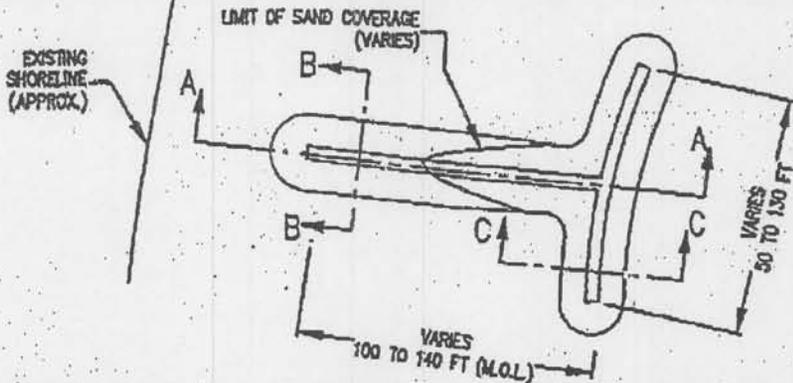


SECTION C

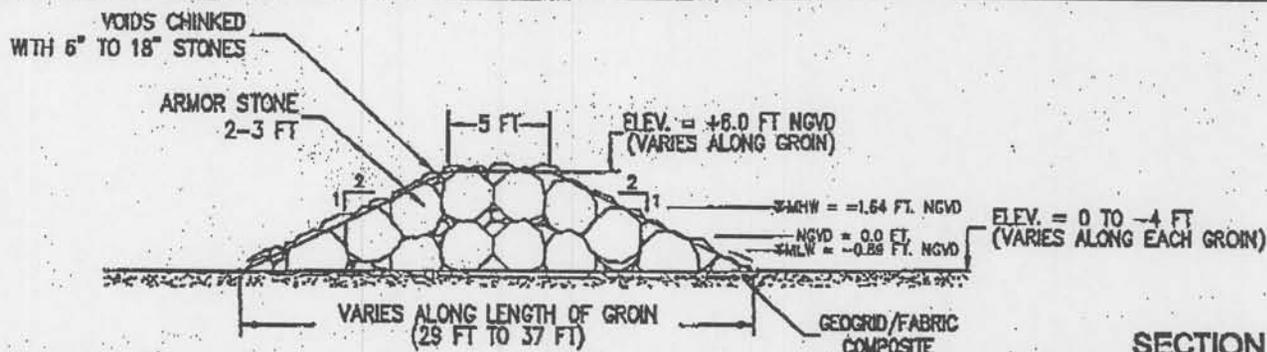
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 associates, inc.  
 4438 Herschel Street  
 Jacksonville, FL 32210

BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
 GROIN C DETAILS

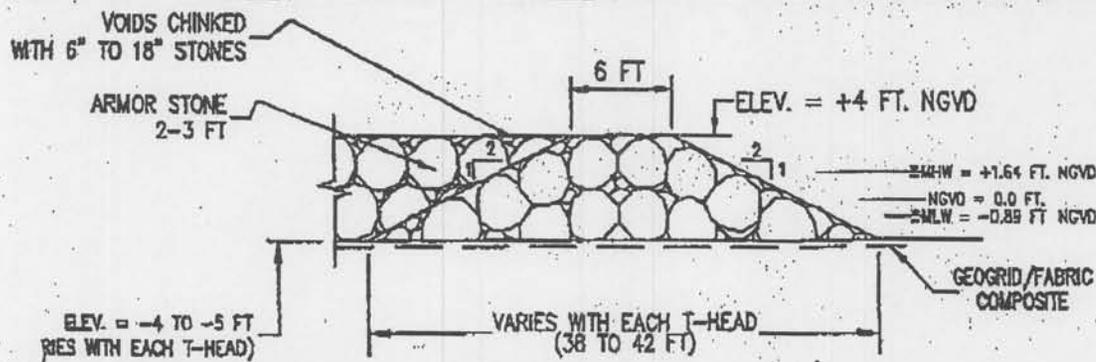
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 APPLICATION # 1999-5545 (TP-DS)  
 DATE 6/14/2000  
 DRAWING PAGE 8 OF 9



SECTION A-A



SECTION B-B



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BROWARD COUNTY SHORE PROTECTION PROJECT  
 SEGMENT III  
 GROINS G-3 THROUGH G-10 DETAIL

US ARMY CORPS OF ENGINEERS  
 APPLICATION # 199905545 (IPD.SG)  
 DATE..... APRIL 2000  
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DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT CORPS OF ENGINEERS  
P.O. BOX 4871  
JACKSONVILLE, FLORIDA 32252-0871

OFFICIAL BUSINESS

FIRST-CLASS MAIL  
U.S. POSTAGE  
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Jacksonville, FL  
Permit No. 1442

14-1  
BROWARD COUNTY  
ATTENTION MR STEPHEN H HIGGINS  
218 SW 1 AVENUE  
FORT LAUDERDALE FLORIDA 33301

**IMPACT ON NATURAL RESOURCES:** Preliminary review of the application indicates that an Environmental Impact Statement will not be required. Coordination with U.S. Fish and Wildlife Service, Environmental Protection Agency, the National Marine Fisheries Service, and other Federal, State, and local agencies, environmental groups, and concerned citizens generally yields pertinent environmental information that is instrumental in determining the impact the proposed action will have on the natural resources of the area. By means of this notice we are soliciting comments on the potential effects of the project on threatened or endangered species or their habitat.

**IMPACT ON CULTURAL RESOURCES:** Review of the latest published version of the National register of Historic Places indicates that no registered properties, or properties listed as eligible for inclusion therein, are located at the site of the proposed work. Presently unknown archeological, scientific, prehistoric, or historical data may be lost or destroyed by the work to be accomplished.

**EVALUATION:** The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reputation may be expected to accrue from the proposal must be balanced against the reasonably foreseeable detriment. All factors which may be relevant to the proposal will be considered including cumulative impacts thereof among these are conservation, economic, ethical, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazard, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, of property ownership, and, in general, the needs and welfare of the people. Evaluation of the impact of the activity on the public interest will also include application of the guidelines promulgated by the Administrator, EPA, under authority of Section 404(d) of the Clean Water Act of the criteria established under authority of Section 102(e) of the Marine, Protection, Research, and Sanctuaries Act of 1972. A permit will be granted unless the licensee is found to be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public, Federal, state, and local agencies and officials, Indian Tribes and other interested parties in order to consider and evaluate the impacts of the proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make or deny the decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

**COASTAL ZONE MANAGEMENT CONSISTENCY:** In Florida, the State approval consults compliance with the approved Coastal Zone Management Plan. In Puerto Rico, a Coastal Zone Management Consistency Concurrence is required from the Puerto Rico Planning Board. In the Virgin Islands, the Department of Planning and Natural Resources permit consults compliance with approved Coastal Zone Management Plan.

**REQUEST FOR PUBLIC HEARING:** Any person may request a public hearing. The request must be submitted in writing to the District Engineer within the designated comment period of the notice and must state the specific reasons for requesting the public hearing.

*John R. Hall*  
JOHN R. HALL  
Chief, Regulatory Division

**CONSOLIDATED JOINT COASTAL PERMIT AND INTENT TO GRANT  
SOVEREIGN SUBMERGED LANDS AUTHORIZATION**

<b>PERMITTEE/AUTHORIZED ENTITY:</b>	Permit/Authorization No.: 0163435-001-JC
Broward County	Date of Issue: May 12, 2003
218 S.W. 1 <sup>st</sup> Avenue	Expiration Date of Construction Phase:
Ft.Lauderdale, FL 33301	May 12, 2008
	County: Broward
	Project: Broward County Beach Nourishment Project (Segment III)

---

This permit is issued under the authority of Chapter 161 and Part IV of Chapter 373, Florida Statutes (F.S.), and Title 62 and 40, Florida Administrative Code (F.A.C.). Pursuant to Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C., the Department is responsible for reviewing and taking final agency action on this activity.

**ACTIVITY DESCRIPTION:**

The proposed project involves: 1) nourishment of the beach at John U. Lloyd State Park (JUL) from R-86 to R-92; 2) nourishment of the beach at Hollywood/Hallandale (H/H) from R-98 (Dania Beach Pier) to R-128 (Broward/Dade County line); 3) installation of a spur connected to the south jetty of Port Everglades Inlet; 4) installation of two T-head groins in JUL; 5) construction of 8.9 acres of artificial reef as mitigation; and 6) transplantation of scleractinian corals from the impacted areas to 0.67 acres of mitigation reef within Segment III. The total volume of renourishment is approximately 1.54 million cubic yards of material, which will be placed along 6.82 miles of the Broward County coastline. Beach compatible material will be obtained from four discrete borrow areas (II, III, IV, and VI) located offshore of the central and northern portions of the Broward County.

**ACTIVITY LOCATION:**

The beach activities are located at John U. Lloyd State Park from R-86 to R-92 and in the Hollywood/Hallandale area from R-98 (Dania Beach Pier) to R-128 (Broward/Dade County line). Borrow Areas II and III are situated north of Hillsboro Inlet. Borrow Area IV is located approximately 4,000 feet south of Hillsboro Inlet. Borrow Area VI is located offshore of Lauderdale-by-the-Sea. The project is located within Broward County, in the Atlantic Ocean, Class III Waters.

**Broward County Beach Nourishment Project (Segment III)**  
**Permit No.: 0163435-001-JC**  
**Page 2 of 22**

This permit constitutes a finding of consistency with Florida's Coastal Zone Management Program, as required by Section 307 of the Coastal Zone Management Act. This permit also constitutes certification of compliance with state water quality standards pursuant to Section 401 of the Clean Water Act, 33 U.S.C. 1341.

This activity also requires a proprietary authorization, as the activity is located on sovereign submerged lands owned by the Board of Trustees of the Internal Improvement Trust Fund, pursuant to Article X, Section 11 of the Florida Constitution, and Sections 253.002 and 253.77, F.S. The activity is not exempt from the need to obtain a proprietary authorization. The Department has the responsibility to review and take final action on this request for proprietary authorization in accordance with Section 18-21.0051, F.A.C., and the Operating Agreements executed between the Department and the water management districts, as referenced in Chapter 62-113, F.A.C. In addition to the above, this proprietary authorization has been reviewed in accordance with Chapter 253, F.S., Chapter 18-21, Section 62-343.075, F.A.C., and the policies of the Board of Trustees.

As staff to the Board of Trustees, the Department has reviewed the activity described above, and has determined that the beach fill activity qualifies for a consent to use sovereign submerged lands, as long as the work performed is located within the boundaries as described herein and is consistent with the terms and conditions herein. Therefore, consent is hereby granted, pursuant to Chapter 253.77, F.S., to perform the activity on the specified sovereign submerged lands.

As staff to the Board of Trustees, the Department has reviewed the activity described above, and has determined that the borrow areas, groins, and jetty spur require public easements for the use of those lands, pursuant to Chapter 253.77, F.S. The Department intends to issue the public easements, subject to the conditions in the previously issued Consolidated Intent to Issue. The final documents required to execute the easements have been sent to the Division of State Lands. The Department intends to issue the Public Easements, upon satisfactory execution of those documents. **You may not begin construction of this activity on state-owned, sovereign submerged lands until the Public Easements have been executed to the satisfaction of the Department.**

A copy of this authorization has been sent to the U. S. Army Corps of Engineers (USACOE) for review. The USACOE may require a separate permit. Failure to obtain this authorization prior to construction could subject you to enforcement action by that agency. You are hereby advised that authorizations also may be required by other federal, state, and local entities. This authorization does not relieve you from the requirements to obtain all other required permits and authorizations.

**Broward County Beach Nourishment Project (Segment III)**  
**Permit No.: 0163435-001-JC**  
**Page 3 of 22**

The above named permittee is hereby authorized to construct the work shown on the application and approved drawings, plans, and other documents attached hereto or on file with the Department and made a part hereof. **This permit and authorization to use sovereign submerged lands is subject to the limits, conditions, and locations of work shown in the attached drawings, and is also subject to the General Conditions and Specific Conditions, which are a binding part of this permit and authorization.** You are advised to read and understand these drawings and conditions prior to commencing the authorized activities, and to ensure the work is conducted in conformance with all the terms, conditions, and drawings. If you are utilizing a contractor, the contractor also should read and understand these drawings and conditions prior to commencing the authorized activities.

**GENERAL CONDITIONS:**

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.727, or 403.859 through 403.861, F.S. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

**Broward County Beach Nourishment Project (Segment III)**  
**Permit No.: 0163435-001-JC**  
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6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. A description of and cause of noncompliance; and

b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

**Broward County Beach Nourishment Project (Segment III)**  
**Permit No.: 0163435-001-JC**  
**Page 5 of 22**

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. A reasonable time for compliance with a new or amended surface water quality standard, other than those standards addressed in Rule 62-302.500, F.A.C., shall include a reasonable time to obtain or be denied a mixing zone for the new or amended standard.

11. This permit is transferable only upon Department approval in accordance with Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes Certification of Compliance with State Water Quality Standards (Section 401, PL 92-500).

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;
2. the person responsible for performing the sampling or measurements;
3. the dates analyses were performed;
4. the person responsible for performing the analyses;
5. the analytical techniques or methods used; and
6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the

permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SPECIFIC CONDITIONS:**

1. The permittee is hereby advised that Florida law states: "No person shall commence any excavation, construction, or other activity involving the use of sovereign or other lands of the state, title to which is vested in the Board of Trustees of the Internal Improvement Trust Fund or the Department of Environmental Protection under Chapter 253, until such person has received from the Board of Trustees of the Internal Improvement Trust Fund the required lease, license, easement, or other form of consent authorizing the proposed use." Pursuant to Florida Administrative Code Rule 18-14.002(1), if such work is done without consent, or if a person otherwise damages state land or products of state land, the Board of Trustees may levy administrative fines of up to \$10,000 per offense.
2. The terms, conditions, and provisions of the required Public Easement (Instrument No. 30628, BOT File No. 060226866) for the borrow areas shall be met. Construction of this activity shall not commence on sovereign submerged lands, title to which is held by the Board of Trustees of the Internal Improvement Trust Fund, until all Public Easement documents have been executed to the satisfaction of the Department.
3. If historical or archaeological artifacts such as, but not limited to, Indian canoes, arrow heads, pottery or physical remains, are discovered at any time within the project site, the permittee shall immediately stop all activities which disturb the soil and notify the Department's District Office and the Bureau of Historic Preservation, Division of Historical Resources, R. A. Gray Building, 500 South Bronough Street, Tallahassee, Florida 32399-0250.
4. For any portions of the beach project (nourishment or erosion control structures) where an Erosion Control Line does not already exist prior to construction, the board of trustees must establish the line of mean high water for that area to establish the boundary line between sovereignty lands of the state and the upland properties, pursuant to Chapter 161.141, F.S. No work shall commence until the Erosion Control Line has been executed to the satisfaction of the Department.
5. The beach fill area to be constructed seaward of the established Erosion Control Line shall remain sovereign lands and shall be accessible to the general public. Additionally, the resulting additions to upland property are also subject to a public easement for traditional uses of the sandy beach consistent with uses that would have been allowed prior to the need for the restoration project in accordance with Chapter 161.141, Florida Statutes.
6. At least 48 hours prior to commencement of work authorized by this permit, the permittee shall provide written notification of the date of the commencement and proposed schedule of construction. All documents relating to the permit shall be sent to the DEP Bureau

**Broward County Beach Nourishment Project (Segment III)**  
**Permit No.: 0163435-001-JC**  
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of Beaches and Wetland Resources, 3900 Commonwealth Boulevard, Mail Station 300, Tallahassee, Florida 32399-3000, phone no. (850) 487-4471, and to the DEP Southeast District Office, PO Box 15425, West Palm Beach, Florida 33416-5425, phone (561) 681-6600.

7. At least 14 days prior to the planned commencement date of construction, the permittee shall schedule a pre-construction conference to review the specific conditions of this permit with the contractors, work crews, the Department's staff representatives, and the marine turtle permit holder. The permittee shall provide a minimum of 7 days advance written notification to the following offices advising of the date, time, and location of the pre-construction conference:

DEP Bureau of Beaches and Wetland Resources  
Mail Station 300  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000  
fax: (850) 488-5257

FWC Bureau of Protected Species Management  
Office of Environmental Services  
620 South Meridian Street  
Tallahassee, Florida 32399-1600  
fax: (850) 921-4369

DEP Southeast District Office  
Submerged Lands and Environmental Resources Program  
400 North Congress Avenue  
West Palm Beach, Florida 33401  
(561) 681-6600 / (SC) 226-6600, fax (SC) 226-6780

8. The Permittee shall develop a Sediment Quality Control / Quality Assurance Plan, as required by Rule 62B-41.008(1)(k)4.b., F.A.C. Once approved by the Department, compliance with the Plan shall be a specific condition of this permit and must be incorporated in the relevant Terms and Conditions of construction contracts. The Plan shall include a project-specific sediment quality specification for grain size distribution, color, and carbonate composition to ensure that the sediment from the borrow sites will meet the standards in Rule 62B-41.007(2)(j), F.A.C. The Plan shall provide quality control procedures for excavating sediment from within the authorized horizontal and vertical limits of the permitted borrow sites; for monitoring and reporting the quality of sediment as it is placed on the beach; and for altering construction operations if the sediment does not comply with the project specific sediment quality specifications or stopping the dredging operation if the specifications cannot be attained. Further, the Plan shall provide procedures for testing the quality of the sediment after it is placed and methods for remediation of any areas of fill material that do not comply with the sediment quality specifications.

9. No work shall be conducted under this permit until the permittee has received a written Notice to Proceed from the Department. At least 60 days prior to the requested date of issuance of the notice to proceed, the permittee shall submit the following for review and approval by the Department:

- a. A detailed **Mitigation Plan** that addresses the timing of artificial hardbottom construction in relation to the beach fill construction, acreage of proposed artificial hardbottom (as required in Specific Condition No. 11), proposed construction methods, the size and type of hard bottom substrate, depth of sand (above underlying rock), and other pertinent updates to the draft mitigation plan;
- b. A **Sediment Quality Control / Quality Assurance Plan**, as required by Rule 62B-41.008(1)(k)4.b., F.A.C. and Specific Condition No. 8;
- c. A detailed **Physical Monitoring Plan**, as described in Specific Condition No. 14 (Physical Monitoring section), indicating the project's predicted design life;
- d. A detailed **Biological Monitoring Plan**, as described in Specific Condition No. 15 (Biological Monitoring section);
- e. Two hard copies and an electronic copy of detailed **final construction plans and specifications** for all authorized activities, including a vessel operations plan. These documents shall be signed and sealed by the design engineer, who must be registered in the State of Florida, and shall bear the certifications specified in Rule 62B-41.007(4), F.A.C. The plans and specifications shall include a description of the beach construction methods to be utilized and drawings and surveys which show all biological resources and work spaces (e.g. anchoring area, pipeline corridors, staging areas, boat access corridors, etc.) to be used for this project. The Department may request additional information that may be necessary to understand and evaluate the proposal;
- f. **Turbidity monitoring qualifications.** Construction at the project site shall be monitored closely to assure that turbidity levels do not exceed the compliance standards established in this permit. Accordingly, an individual familiar with beach construction techniques and turbidity monitoring shall be present at all times when fill material is discharged on the beach. This individual shall have authority to alter construction techniques or shut down the dredging or beach construction operations if turbidity levels exceed the compliance standards established in this permit. The names and qualifications of those individuals performing these functions along with 24-hour contact information shall be submitted for approval;
- g. **Biological monitoring qualifications.** The names and qualifications of those individuals performing the biological monitoring shall be submitted for Department approval. All biological monitoring required by this permit shall be conducted by individuals having a good working knowledge of marine fish, marine turtles, algae, coral, and sponge taxonomy.

10. The permittee shall construct and maintain a shore-parallel sand dike at the beach disposal area at all times during hydraulic discharge on the beach as may be required to meet turbidity standards prescribed by this permit.

**11. Mitigation.**

The unavoidable burial of 7.6 acres of nearshore hardbottom that will result from the direct placement of fill and from the equilibration of the toe of fill (TOF) shall be mitigated by creating a minimum of 8.9 acres of artificial hard bottom substrate. All mitigation shall be completed no later than six months after the commencement of the Segment III beach project construction. If artificial reef construction is not completed within the specified time, a time lag coefficient shall be applied to increase the mitigation ratio.

The artificial reefs shall consist of limestone boulders placed on the sandy ocean bottom. These sites shall be located landward of the first offshore reef and seaward of the estimated equilibrium toe of fill, in mean water depths of 15 to 20 feet. Boulders shall be 4 feet or greater in diameter, with a specific gravity of at least 2.1, in order to prevent sliding or tipping/rolling during storm events. The distance between individual boulders shall not exceed five feet. In order to minimize subsidence, the selected placement areas shall contain a layer of sand no more than two feet thick over the hardbottom. A 50-foot wide buffer from all significant natural hardbottoms shall be maintained during boulder placement. These design specifications are consistent with Department guidelines and general practices used in the construction of artificial reefs along the Atlantic Coast of Florida.

A portion of the artificial reef site between R-101 and R-104 will serve as the scleractinian coral transplantation receiver site. Deployment of the artificial reefs will begin at Mitigation Area VIII, from R-101 to R-104 (see Attachment 1, The Mitigation Plan).

**12. Transplantation of corals.**

Transplantation of scleractinian corals from the areas of direct and secondary impact to the mitigation reef is required for saving important and declining reef-building fauna of the nearshore area and for initiation of coral succession. All scleractinian coral colonies measuring 15 cm or more shall be removed from the area located between the estimated Equilibrium Toe of Fill and the shoreline in Segment III and transplanted into a portion of the artificial reef between R-101 and R-104 designated as the coral transplantation receiver site. There, the corals shall be cemented on the artificial reefs. The transplantation must be done in the pattern that will a) create a percent bottom cover by corals of about 3%; and b) concentrate particular species to stimulate local recruitment and enhance succession. This created coral community shall be the subject of a long-term monitoring program to document survival and growth of the transplanted corals.

**MONITORING REQUIRED:**

**13. Water Quality Monitoring (Turbidity)**

Turbidity monitoring in the vicinity of the borrow areas and the beach nourishment sites shall be monitored during construction. Turbidity will be measured at background and compliance stations.

**A. Borrow Sites:**

Frequency: Every six hours during dredging.

Location: Background: Mid-depth, at least 300 meters upcurrent from the dredge site, clearly outside of any turbidity generated by the project.

Compliance: Mid-depth, no more than 150 meters downcurrent from the dredge site, within the densest portion of any visible turbidity plume.

**B. Beach Nourishment and Groin Construction Sites:**

Frequency: Every six hours during pumping operations or other in-water work.

Location: Background: Mid-depth, at a point approximately 150 meters offshore and 300 meters upcurrent from the discharge point, clearly outside of any turbidity generated by the project.

Compliance: Mid-depth, at a point approximately 150 meters offshore and no more than 150 meters downcurrent from the discharge point, within the densest portion of any visible turbidity plume.

Weekly summaries of all monitoring data shall be submitted to the Bureau of Beaches and Wetland Resources and to the Southeast District Office within one week of collection, with documents containing the following information: (1) "Permit Number 0163435-001-JC"; (2) "Broward County Beach Nourishment Project (Segment III)"; (3) dates and times of sampling and analysis; (4) a statement describing the methods used in collection, handling, storage and analysis of the samples; (5) a map indicating the sampling locations, current direction, plume configuration and the location of the dredge and discharge point(s); and (6) a statement by the individual responsible for implementation of the sampling program concerning the authenticity, precision, limits of detection and accuracy of the data. Monitoring reports shall also include the following information for each sample that is taken: a) time of day samples taken; b) depth of water body; c) depth of sample; d) antecedent weather conditions; e) tidal stage and direction of flow; f) wind direction and velocity; and g) DGPS position.

The compliance locations given above shall be considered the limits of the temporary mixing zone for turbidity allowed during construction. If monitoring reveals turbidity levels at the compliance sites are greater than 29 NTUs above the associated background turbidity levels,

construction activities shall **cease immediately** and not resume until corrective measures have been taken and turbidity has returned to acceptable levels.

**14. Physical Monitoring.**

Pursuant to 62B-41.005(16), F.A.C., physical monitoring of the project is required through acquisition of project-specific data to include, at a minimum, topographic and bathymetric surveys of the beach, offshore, and borrow site areas, aerial photography, and engineering analysis. The monitoring data is necessary in order for both the project sponsor and the Department to regularly observe and assess, with quantitative measurements, the performance of the project, any adverse effects which have occurred, and the need for any adjustments, modifications, or mitigative response to the project. The scientific monitoring process also provides the project sponsor and the Department information necessary to plan, design, and optimize subsequent follow-up projects, potentially reducing the need for and costs of unnecessary work, as well as potentially reducing any environmental impacts that may have occurred or be expected.

**Prior to issuance of the first Notice to Proceed, the permittee shall submit a detailed Physical Monitoring Plan subject to review and approval by the Department** as required in Specific Condition 9.c. The Physical Monitoring Plan shall indicate the project's predicted design life.

A monitoring plan that combines or uses monitoring from other projects or annual county-wide monitoring would be considered. Data collection for this permit may overlap other project monitoring, and consolidation of data collection should be considered. However, monitoring submittals must clearly identify all permits and conditions, and contracts with DEP that the submittals are intended to satisfy. This will allow for more efficient accounting by all parties and permit compliance accounting by the department.

The approved Monitoring Plan can be revised at any later time by written request of the permittee and with the written approval of the Department. For all subsequent beach nourishment projects following the initial nourishment to be performed under this permit, the Monitoring Plan shall specify a renewal of the same monitoring and monitoring cycle for the beaches and affected borrow site(s).

As guidance for obtaining Department approval, the plan shall generally contain the following items:

- a. Topographic and bathymetric profile surveys of the beach and offshore shall be conducted within 90 days prior to commencement of construction, and within 60 days following completion of construction of the project. Thereafter, monitoring surveys shall be conducted annually for a period of three (3) years, then biennially until the next beach nourishment event or the expiration of the project design life, whichever occurs first. The monitoring surveys shall be conducted during a spring or summer month and repeated as close as practicable during that

same month of the year. If the time period between the immediate post-construction survey and the first annual monitoring survey is less than six months, then the permittee may request a postponement of the first monitoring survey until the following spring/summer. A prior design survey of the beach and offshore may be submitted for the pre-construction survey if consistent with the other requirements of this condition.

The monitoring area shall include profile surveys at each of the Department of Environmental Protection's DNR reference monuments within the bounds of the beach fill area and along at least 5,000 feet of the adjacent shoreline on both sides of the beach fill area. For those project areas that contain erosion control structures, such as groins or breakwaters, additional profile lines shall be surveyed at a sufficient number of intermediate locations to accurately identify patterns of erosion and accretion within this subarea. All work activities and deliverables shall be conducted in accordance with the latest update of the OBCS *Statewide Coastal Monitoring Program, Regional Data Collection and Processing Plan, Monitoring Plan Technical Specifications for Topographic and Bathymetric Surveying*.

The influence of Borrow Area II on the adjacent beach shall be monitored in the same manner as the beach fill areas, and the results analyzed for possible adverse effects. These areas extending from Boca Raton Inlet through Hillsboro Inlet shall be specifically monitored, analyzed, and reported as part of an approved Monitoring Plan. Prior to the issuance of a Notice to Proceed, the permittee shall submit a Contingency Plan to remediate any adverse impacts to the beach resulting from the dredging of Borrow Area II. Remedial solutions to be considered should include the placement of beach fill material, as applicable. This Plan shall be subject to review and approval by the Department. The approved Contingency Plan can be revised at any later time by written request of the permittee and with the written approval of the Department.

Not only the areas of the beach fill, but the entire Segment III shoreline from the Port Everglades Inlet shall be monitored in order to capture the effect of the project on the non-nourished areas and other geographical features.

b. Bathymetric surveys of the borrow area(s) shall be conducted within 90 days prior to commencement of construction, and within 60 days following completion of construction of the project concurrently with the beach and offshore surveys required above. Thereafter, monitoring surveys of the borrow areas shall be dependent on their location. Borrow sites located in tidal inlet shoals or in nearshore waters above the depth of closure for littoral transport processes shall be at two (2) year intervals concurrently with the beach and offshore surveys required above. A prior design survey of the borrow area may be submitted for the pre-construction survey if consistent with the other requirements of this condition.

Borrow areas shall be monitored pre and post construction, as indicated above, and at four (4) year intervals concurrent with the beach and offshore profile surveys required above.

Survey grid lines across the borrow area(s) shall be spaced to provide sufficient detail for accurate volumetric calculations but spaced not more than a maximum of 500 feet apart, and shall extend a minimum of 500 feet beyond the boundaries of the borrow site. For borrow sites located in tidal inlet shoals, bathymetric surveys of the entire shoal complex, including any attachment bars, shall be conducted unless otherwise specified by the Department based upon the size of the shoal and the potential effects of the dredging on inlet processes. In all other aspects, work activities and deliverables shall be consistent with the BBWR *Statewide Coastal Monitoring Program, Regional Data Collection and Processing Plan, Monitoring Plan Technical Specifications for Bathymetric Surveying*.

c. Aerial photography of the beach shall be taken concurrently with the post-construction survey and each annual and biennial monitoring survey required above, as close to the date of the beach profile surveys as possible, and during approximate low water tide on that date. The limits of the photography shall include the surveyed monitoring area as described above. The photography shall be color vertical photos with a 30% forward overlap, taken from an elevation of 3,000 feet (1:6,000 negative scale) and centered on the local shoreline. A digital scan of the color photos at a rate of 21 microns with a pixel size of 0.4 feet shall be made and submitted in TIF format (uncompressed) on CD or DVD.

d. The permittee shall submit an engineering report and the monitoring data to the Bureau of Beaches and Wetland Resources within 90 days following completion of the post-construction survey and each annual or biennial monitoring survey. The survey data and control information should be submitted on electronic media such as floppy disk, or CD-ROM, in an ASCII format stored as specified in the *Statewide Coastal Monitoring Program, Regional Data Collection and Processing Plan, Monitoring Plan Technical Specifications*.

The report shall summarize and discuss the data, the performance of the beach fill project, and identify erosion and accretion patterns within the monitored area. In addition, the report shall include a comparative review of project performance to performance expectations and identification of adverse impacts attributable to the project.

Appendices should include plots of survey profiles and graphical representations of volumetric and shoreline position changes for the monitoring area. Results should be analyzed for patterns, trends, or changes between annual surveys and cumulatively since project construction.

Monitoring reports and data shall be submitted to the Bureau of Beaches and Wetland Resources in Tallahassee. Failure to submit reports and data in a timely manner constitutes grounds for revocation of the permit. When submitting any monitoring information to the Office, please include a transmittal cover letter clearly labeled with the following at the top of each page: **"This monitoring information is submitted in accordance with Item No. [XX] of the approved Monitoring Plan for Permit No. [XX] for the monitoring period [XX]."**

## **15. Biological Monitoring**

**As required in Specific Condition Number 9.d., the permittee shall submit a detailed Biological Monitoring Plan subject to review and approval by the Department.**

The biological monitoring program consists of 1) sedimentation surveys of the reef edges adjacent to the borrow areas during and after the construction phase; 2) pre-construction and post-construction surveys of the pipeline corridors to document impacts to hardbottom communities along the routes, and weekly inspections of the pipelines during construction to check for leaks; 3) a long-term, County-wide reef community health assessment; 4) construction phase and long-term post-construction surveys of the nearshore hardbottom to monitor for secondary impacts; 5) a long-term mitigation monitoring program, which includes monitoring of epibenthos, including transplanted corals and coral recruitment, fish, and algal recruitment; and 6) a construction phase and long-term post-construction sea turtle monitoring program. The goals of biological monitoring program are to identify project-related impacts upon protected species and significant biological resources, document succession on the artificial reefs to determine the replacement habitat value of the artificial reefs compared to natural nearshore hardbottom, and to provide a quantitative approach to mitigation for unavoidable and unexpected project-related impacts.

**Nearshore hardbottom habitats.** Biological and sedimentation monitoring of the nearshore hardbottom habitats adjacent to the beach fill sites shall be conducted during the pre-construction phase; construction phase, immediately after construction, and post-construction. During construction, weekly observations of sedimentation/siltation impacts shall be performed in the nearshore zone via a series of cross-shore transects that extend 300 feet seaward of the equilibrium toe of fill. Stress indicators on scleractinian (stony) and soft coral species must be used in conjunction with standing sediment levels to trigger implementation of corrective actions that may include extension of shore-parallel dykes on the beach, cessation of sand pumping until the discharge plume dissipates, and/or shifting the dredge to an alternate sand source within the approved borrow sites containing a lower percent of fine-grained material. A network of nearshore monitoring stations/cross shore **permanent** transects shall be maintained to specifically identify and address potential effects from sediment and turbidity movement to the adjacent, deeper and more stable nearshore hardbottom communities. Annual surveys shall be conducted during the first three years post-construction (Years 1, 2 and 3), and conducted again at the end of the fifth year post-construction. Fish populations shall be also be assessed annually (years 1, 2 and 3) at 30 of the epibenthos monitoring sites within the impact areas during the summer months for comparison to the pre-construction survey. Two hardbottom edge surveys will also be conducted by divers, propelled via scooter, with attached DGPS antennae: one immediate prior to construction and one three years after construction. The final impact of fill equilibration is expected to occur at the end of Year 3 (post-construction).

**Offshore hardbottom habitats.** Impacts to offshore hardbottoms located adjacent to the borrow sites from the sedimentation generated by hopper dredging operations shall be monitored

throughout construction. The monitoring program shall measure the amount and duration of sedimentation on the reefs and shall include observations for indicators of biological stress to certain species of stony (scleractinian) corals and soft corals (octocorals). Thresholds for stress to corals shall be identified experimentally and included in the **Monitoring Plan**. There shall be multiple sediment monitoring stations adjacent to each borrow area and six control stations shall be located at six of the County's permanent reef monitoring stations. The sites shall be monitored once every week starting 8 weeks prior to construction, once every week during construction, and once every week for 8 weeks after construction. In addition to this monitoring schedule, Borrow Area VI shall be used as a test site during the first 28 days of dredging operations and shall be monitored on a daily basis or each second day, depending on whether construction will be done with one or two dredges. The results of the daily/bi-daily monitoring shall be compared after 28 days to the results of weekly monitoring to determine if the increased frequency of visits yields different average daily sedimentation rates. Provided no significant difference is revealed, sedimentation monitoring shall be continued weekly during the construction period. **Use of a borrow area shall be suspended** if the average daily measure of sediment exceeds defined standards. Histological tissue analyses of the corals shall be conducted if stress indicator index values exceed defined levels. All sites shall be revisited, photographed, and examined for cumulative sediment impact six months post-construction and one year post-construction. The long-term, annual reef community monitoring is a continuation and expansion of Broward County's current countywide reef monitoring program.

**Monitoring of Mitigation Reef.** The colonization of the mitigation reefs by epibenthos shall be monitored semi-annually during the first two post-construction years (Years 1 and 2), and annually during the third and fourth post-construction years (Years 3 and 4). The density of epifauna and percent bottom cover shall be assessed along a series of twenty-five 30-meter-long, cross-shore transects. Fish counts shall be performed along 50 transects (25 on mitigation reefs and 25 on nearby natural hardbottom) for correlation between fish populations and epibenthic communities. A direct comparison of the epibenthic communities and fish assemblages on the mitigation reefs to adjacent (nearby) natural hardbottom shall be made to determine the replacement habitat value of the mitigation reefs.

Long-term monitoring of the mitigation reefs will be performed to determine the replacement habitat value compared to natural nearshore hardbottom. An assessment of algal recruitment, with an emphasis upon replacement of preferred algal food species for sea turtles, will be conducted as a part of the monitoring program of the mitigation area.

For the assessment of algal recruitment, two control stations shall be established over a 0.5 acre area of the artificial reef located between FDEP control monuments R-101 and R-104. The 30 meter long transects shall be established following the rugosity of the boulders so that algal recruitment on both horizontal surfaces and boulder slopes shall be assessed. The same survey methodology shall be used in two control stations on natural hardbottom. The 30 meter long transects shall be documented using digital video sampling (Sony TRV-900) in progressive scan

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mode. Macroalgae abundance shall be assessed by percent cover using frame grabbing and PointCount'99 software. Species identification within the stations shall be performed *in situ* by a second, qualified diver/biologist (M.S. degree or higher). The biologist shall swim two 1-meter wide corridors within the station and record a comprehensive taxonomic list of species present in the entire 60 square meter box. The algal surveys shall be conducted on a semi-annual basis (spring/summer and fall/winter) for a post-construction period of 4 years.

**Sea turtle monitoring.** In order to ensure that marine turtles are not adversely affected by the construction activities authorized by this permit, the permittee shall adhere to the following conditions:

1. All fill material placed must be sand that is analogous to a native beach in the vicinity of the site that has not been affected by prior renourishment activities. The fill material must be equivalent in both coloration and grain size distribution to the native beach. All such fill material must be free of construction debris, rocks or other foreign matter and must not contain, on average, greater than 5 percent coarse gravel or cobbles, exclusive of shell material (retained by the #4 sieve).
2. Beach nourishment shall be started after October 31 and be completed before May 1 in the following areas: R36 to R-43, R-51 to R-72, and R-86 to R-92. During the May 1 through October 31 period, no construction equipment or pipes will be stored on the beach in these areas.
3. Construction-related activities are authorized to occur on the nesting beach (seaward of existing coastal armoring structures or the dune crest) during the early part of the nesting season (March 1 through April 30) in the following areas: R36 to R-43, R-51 to R-72, and R-86 to R-92, under the following conditions.
  - a. A daily marine turtle nest survey of the nesting beach in the vicinity of the project (including areas of beach access) shall be conducted starting March 1 and continue until October 31. Only those nests that may be affected by construction activities shall 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. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests. Nests deposited within areas where construction activities have ceased or will not occur for 65 days shall be marked and left in place unless other factors threaten the success of the nest. Such nests will be marked and the actual location of the clutch determined. A circle with a radius of ten (10) feet, centered at the clutch, shall be marked by stake and survey tape or string. No construction activities shall enter this circle and no adjacent construction shall be allowed which might directly or indirectly disturb the area within the staked circle.

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- b. No construction activity may commence until completion of the marine turtle survey each day.
  - c. It is the responsibility of the permittee to ensure that the project area and access sites are surveyed for marine turtle nesting activity. All nesting surveys, nest relocations screening or caging activities etc. shall be conducted only by persons with prior experience and training in these activities and who is duly authorized to conduct such activities through a valid permit issued by the Fish and Wildlife Conservation Commission (FWC), pursuant to Florida Administrative Code 68E-1.
4. If the beach nourishment project will be conducted during the period from November 1 through November 30, daily early morning sea turtle nesting surveys must be conducted 65 days prior to project initiation and continue through September 30, and eggs must be relocated per the preceding requirements.
5. Construction-related activities in the area between R-98 and R-128, removal of derelict groin structures along the entire Segment III shoreline and groin construction in John U. Lloyd State Park (R-86 to R-92), are authorized to occur on the nesting beach (seaward of existing coastal armoring structures or the dune crest) during the nesting season (March 1 through October 31) under the following conditions.
  - a. A daily marine turtle nest survey of the nesting beach in the vicinity of the project (including areas of beach access) shall be conducted starting March 1 and continue until October 31. Only those nests that may be affected by construction activities shall 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. Nest relocations in association with construction activities shall cease when construction activities no longer threaten nests. Nests deposited within areas where construction activities have ceased or will not occur for 65 days shall be marked and left in place unless other factors threaten the success of the nest. Such nests will be marked and the actual location of the clutch determined. A circle with a radius of ten (10) feet, centered at the clutch, shall be marked by stake and survey tape or string. No construction activities shall enter this circle and no adjacent construction shall be allowed which might directly or indirectly disturb the area within the staked circle.
  - b. No construction activity may commence until completion of the marine turtle survey each day.
  - c. It is the responsibility of the permittee to ensure that the project area and access sites are surveyed for marine turtle nesting activity. All nesting surveys, nest relocations screening or caging activities etc. shall be conducted only by persons with prior experience and training in these activities and who is duly authorized to conduct such activities through a valid permit issued by the Fish and Wildlife Conservation Commission (FWC), pursuant to F.A.C. 68E-1.

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6. If construction occurs at night during the sea turtle nesting season, nighttime surveys for nesting turtles must be conducted in the area of active construction. In the event a nesting sea turtle is observed, all construction activity in that area must cease until the nesting turtle has returned to the water and the eggs have been relocated by the individual permitted to conduct such relocations through a valid permit issued by the Fish and Wildlife Conservation Commission (FWC), pursuant to Florida Administrative Code 68E-1.
7. Sea turtle nests within the 0.2-mile (1,100 linear feet) that incorporates the groin construction limits shall be staked and the location recorded. Prior to hatchling emergence, each nest shall be caged in accordance with FWC guidelines. The caged nest shall be monitored in accordance with FWC guidelines for such caging activities. All emerged hatchlings shall be collected at the intervals specified in the FWC guidelines and released at a location approximately 1,000 feet south of the groin construction area. The hatchling relocations shall continue for a three-year period. Information on the number of nests caged and the number of hatchlings released shall be provided to FWC annually with other Reports required for this project.
8. In the event a groin structure fails or begins to disintegrate, all debris and structural material shall be removed from the nesting beach area and deposited off-beach immediately. If maintenance of a groin structure is required during the period from March 1 through November 30, no work shall be initiated without appropriate authorization for incidental take from the U.S. Fish & Wildlife Service South Florida Ecological Services Office.
9. The groin system shall be removed if it is determined to not be effective or to be causing a significant adverse impact to the beach and dune system or to marine turtles.
10. From March 1 through November 30, all project lighting shall be limited to the immediate area of active construction only and shall be the minimal lighting necessary to comply with U.S. Coast Guard and/or OSHA requirements. Stationary lighting on the beach and all lighting on the dredge shall be minimized through reduction, shielding, lowering, and appropriate placement of lights to minimize illumination of the nesting beach and water. Shields must 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).
11. From March 1 through November 30, staging areas for construction equipment shall be located off the beach. Nighttime storage of construction equipment not in use shall be off the beach to minimize disturbance to sea turtle nesting and hatching activities. 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.

12. Immediately after completion of the each fill placement event and prior to February 15 for 3 subsequent years if placed sand still remains on the beach, the beach shall be tilled as described below. During the 3 years following each fill placement event, the permittee may measure sand compaction in the area of restoration in accordance with a protocol agreed to by the FWC, the Department, the U.S. Fish & Wildlife Service, and the applicant to determine if tilling is necessary. At a minimum, the protocol provided under a. and b. below shall be followed. If required, the area shall be tilled to a depth of 36 inches. All tilling activity must be completed prior to March 1. An annual summary of compaction surveys and the actions taken shall be submitted to the FWC. If the project is completed during the nesting season, tilling shall not occur in areas where nests have been left in place or relocated unless authorized by the U.S. Fish and Wildlife Service in an Incidental Take Statement. This condition shall be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.
  - a. 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).
  - b. 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 lay 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 shall include all 18 values for each transect line, and the final 6 averaged compaction values.
  - c. If the average value for any depth exceeds 500 psi for any two or more adjacent stations, then that area shall be tilled prior to March 1. 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 FWC 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.
13. Visual surveys for escarpments along the beach fill area shall be made immediately after completion of the beach nourishment project and prior to March 1 for the following three years if placed sand still remains on the beach. All scarps shall be leveled or the beach profile shall be reconfigured to minimize scarp formation. In addition, weekly surveys of

the project area shall be conducted during the two nesting seasons following completion of fill placement as follows.

- a. The number of escarpments and their location relative to DNR-DEP reference monuments shall be recorded during each weekly survey and reported relative to the length of the beach surveyed (e.g., 50% scarps). Notations on the height of these escarpments shall be included (0 to 2 feet, 2 to 4 feet, and 4 feet or higher) as well as the maximum height of all escarpments.
  - b. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet shall be leveled to the natural beach contour by April 15. Any escarpment removal shall be reported relative to R-monument.
  - c. If weekly surveys during the marine turtle nesting season document subsequent reformation of escarpments that exceed 18 inches in height for a distance of 100 feet, the FWC shall be contacted immediately to determine the appropriate action to be taken. Upon notification, the permittee shall level escarpments in accordance with mechanical methods prescribed by the FWC.
14. A lighting survey shall be conducted from the renourished berm prior to March 1 of the first nesting season following nourishment and action taken to ensure that no lights or light sources are visible from the newly elevated beach. A report summarizing all lights visible, using standard survey techniques for such surveys, shall be submitted to FWC by March 15.
  15. The applicant shall arrange a meeting between representatives of the contractor, the Department, the FWC, and the permitted person responsible for egg relocation at least 30 days prior to the commencement of work on this project. At least 10 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.
  16. Reports on all nesting activity shall be provided for the initial nesting season and for a minimum of two additional nesting seasons. Monitoring of nesting activity in the three seasons following construction shall include daily surveys and any additional measures authorized by the FWC. Reports submitted shall include daily report sheets noting all activity, nesting success rates, hatching success of all relocated nests, hatching success of a representative sampling of nests left in place (if any), dates of construction and names of all personnel involved in nest surveys and relocation activities. Data should be reported separately for filled areas and nonfilled areas in accordance with the attached Table. All reports should be submitted by January 15 of the following year.

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17. Reports on the distribution and abundance of marine turtles in the vicinity of the nearshore hard bottom in the project area, on mitigation sites, and on adjacent, undisturbed “control” sites shall also be provided prior to any nourishment activity, during all nourishment work, and then for a minimum of two additional years. Monitoring of in-water sea turtle distributions shall include annual surveys and any additional measures authorized by FWC. Prior to issuance of a Notice to Proceed, the applicant must submit a Monitoring Plan for In-water Sea Turtle Distribution and Abundance that will be approved by DEP and FWS and incorporated into this permit by reference.
18. Reports on macroalgal distribution and abundance on nearshore hard bottom adjacent to the impact area, at the mitigation site, and on adjacent hard bottom communities that will not be impacted by the proposed nourishment (“control” communities) shall be provided prior to any nourishment activity and then for a minimum of two additional years. These reports shall include annual quantitative assessments of percent cover by species, assessment of algal height per quadrat and per species, and amount of sediment within the quadrat prior to sampling. The amount, or biomass, of different algal species present at different times of the year should also be assessed. While long term monitoring should be done in replicate quadrats, additional plots should be identified (~ 10 cm X 10 cm) and all material, invertebrate, algae and sediment, scraped from the surface. Replicate samples should then be sorted to the highest taxonomic level possible and dried to constant weight.
19. In the event a sea turtle nest is excavated during construction activities, all work shall cease in that area immediately and the permitted person responsible for egg relocation for the project should be notified so the eggs can be moved to a suitable relocation site.
20. In the event a hopper dredge is utilized for sand excavation, all conditions in the NMFS Biological Opinion for hopper dredging along the SE U.S. Atlantic Coast (dated August 25, 1995) must be followed, and the FWC shall be sent copies of the reports specified in Condition 6 of the Biological Opinion.
21. Upon locating a dead, injured, or sick endangered or threatened sea turtle specimen, initial notification must be made to the FWC at 1-888-404-FWCC. Care should be taken in handling sick or injured specimens to ensure effective treatment and care and in handling dead specimens to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of sick or injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence intrinsic to the specimen is not unnecessarily disturbed.

**16. T-head Groins.**

Pursuant to Rule 62B-41.007(2)(m), F.A.C., all coastal structures shall be marked in accordance with Section 327.40, F.S., for navigation and boating safety. Under present conditions, the

existing coastal structures and strong tidal currents at this segment of beach shore can create hazardous conditions for swimming. Breaking waves and large swell can create hazardous conditions to swimmers. Caution is advised, and as a condition of the permit, signage shall be provided along the shoreline adjacent to the groins to warn recreational beach users of hazardous conditions to swimmers in the vicinity of the structures.

**17. Planting of Dune Vegetation.**

Dune vegetation of native species may be planted in order to establish and stabilize dunes.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT  
OF ENVIRONMENTAL PROTECTION

\_\_\_\_\_  
Michael Sole, Chief  
Bureau of Beaches and Wetland Resources

**FILING AND ACKNOWLEDGMENT**

FILED, on this date, pursuant to Section 120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

\_\_\_\_\_  
Deputy Clerk

\_\_\_\_\_  
Date

Prepared by \_\_\_\_\_.

\_\_\_\_\_ pages attached.



# United States Department of the Interior



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

March 11, 2002

James Duck  
U.S. Army Corps of Engineers  
Planning Division  
Environmental Branch  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

Service Log No.: 4-1-99-I-506  
Application No.: 99905545 (IP-DSG)  
Dated: April 26, 2000  
Project: Broward County Shore Protection Project  
Applicant: Broward County Department of Planning  
and Environmental Protection  
County: Broward

Dear Mr. Duck:

This document transmits the Fish and Wildlife Service's (Service) Biological Opinion for the Broward County Shore Protection Project located in Broward County, Florida. The proposed project may affect the threatened loggerhead sea turtle (*Caretta caretta*), the endangered leatherback sea turtle (*Dermochelys coriacea*), and the endangered green sea turtle (*Chelonia mydas*). The proposed project may affect, but is not likely to adversely affect the endangered West Indian manatee (*Trichechus manatus*). The biological opinion, in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*), provides an evaluation of the project effects to listed species.

This biological opinion is based on information in the Service's files, information in the Public Notice referenced above, and information provided to the Service by the Florida Fish and Wildlife Conservation Commission (FWC), the Florida Department of Environmental Protection (DEP), and the Broward County Department of Planning and Environmental Protection (Broward County). A complete administrative record of this consultation is on file at the South Florida Ecological Services Field Office, Vero Beach, Florida.

## CONSULTATION HISTORY

The Service received a letter dated September 24, 1999, from the U.S. Army Corps of Engineers (Corps) requesting a list of any species or their critical habitat either listed or proposed for listing that may be present in the study area for the Broward County Shore Protection Project, Segments II and III, Broward County, Florida.

The Service provided in a letter dated October 19, 1999, with a list of the federal species likely to be present in the project area. The species list includes the endangered West Indian manatee, the endangered hawksbill sea turtle, the endangered leatherback sea turtle, the endangered green sea turtle, and the threatened loggerhead sea turtle. No critical habitat has been designated in the project vicinity.

The Service received in a letter dated November 8, 1999, a request from the Department of Interior, Office of Secretary, to provide technical assistance to the Federal Register Notice for the Corps "Intent to Prepare a Draft Environmental Impact Statement for the Broward County Shore Protection Project, Broward County, Florida." A copy of the October 19, 1999, technical assistance letter was provided.

The Service received a letter dated February 3, 2000, from the Corps Planning Division requesting formal consultation for a may affect determination for nesting sea turtles.

The Service received a Reimbursement Agreement Authorization from the Corps, dated April 26, 2000, to prepare a Fish and Wildlife Coordination Act (FWCA) Report for the proposed Federal project.

The Service received the Corps' Public Notice, dated April 26, 2000, from the Corps Regulatory Division requesting comments on a federal permit application [199905545 (IP-DSG)] for Broward County for the proposed beach nourishment. The Corps made the determination in the letter of may affect, but not likely to adversely affect the West Indian manatee, provided that the standard manatee construction precautions are followed. The Corps also made the determination in the letter of may affect, but not likely to adversely affect the listed sea turtles. The Corps also noted that the applicant wishes to nourish the beaches during the nesting season.

The Service provided in a letter dated May 26, 2000, concurrence with the Corps determination of may affect, but not likely to adversely affect the West Indian manatee. However, the Service could not provide concurrence with the may affect, not likely to adversely affect determination for listed sea turtles. The Service requested additional information on the project's effects on listed sea turtles in order to determine if formal consultation was warranted in accordance with regulations governing interagency consultations (51 CFR 402.14). The letter identified project specific resource evaluation needs to assess the project's impacts.

In the May 26, 2000, letter, the Service recommended denial of the project as proposed and notified the Corps, in accordance with the procedural requirements of the 1992 404(q) MOA Part IV, 3(a) between the Service and the Corps, that the proposed work may affect aquatic resources of national importance.

The Service received correspondence from both the Florida Fish and Wildlife Conservation Commission (May 26, 2000), the Federal Environmental Protection Agency (May 26, 2000), and the National Marine Fisheries Service (May 24, 2000), also noting potential resource impacts from the proposed project.

The Service received correspondence from Broward County dated June 28, 2000, requesting relaxation of the sea turtle related construction window for beach nourishment activities for the beaches of Hollywood and Hallandale in south Broward County, Florida. For nourishment projects in Brevard County, Florida, south through Broward County, Florida, nourishment will not be allowed during the main part of the nesting season (March 1 through October 31). This timing restriction has been agreed to by the U.S. Army Corps of Engineers Jacksonville District as documented in a December 22, 1994, letter from A.J. Salem, Chief, Planning Division.

The Service provided in a letter dated July 24, 2000, outlining data needs necessary to evaluate the request to relax the construction window restrictions.

The Service received correspondence from the Corps dated July 28, 2000, transmitting side scan and bathymetric survey data.

The Service received additional information from the County, dated August 31, 2000, addressing some of the Service's data needs.

The Service received from the Florida Department of Environmental Protection data evaluations of the August submittal and remaining outstanding data needs and clarifications.

The Service provided an E-mail, dated January 5, 2001, to the County and the Corps requesting clarification of turtle nesting data, the closed season nourishment request, the location of the pipeline corridors, sediment profiles, monitoring plans, nearshore habitat descriptions, and temporal lag mitigation proposals.

The Service received additional information from the Corps in correspondence dated February 5, 2001.

The Service received additional data from the County, dated February 7, 2001, addressing Service issues.

The Service received correspondence from the Corps, dated March 5, 2001, requested a project change to conduct beach nourishment during the summer sea turtle nesting season.

The Service provided an E-mail, dated May 22, 2001, requesting data clarification of the sand durability, mitigation proposal, and temporal lag questions.

The Service requested in an E-mail, dated June 19, 2001, electronic copies of the draft sections of the Draft Environmental Impact Statement to facilitate the preparation of the FWCA Report.

The Service received an E-mail, dated June 20, 2001, from the County providing additional data on the sand durability.

The Service received an E-mail, dated July 16, 2001, from the County on the Corps' request to nourish during the nesting season for the southern portion of the County. The County provided clarification of the nesting data densities.

The Service provided an E-mail, dated July 23, 2001, to the Corps and the County on Coastal Barrier Resource Act designations for portions of John U. Lloyd Beach State Recreation Area. The Service also requested clarification of the pipeline corridor survey protocol and turbidity plume issues within the 200-foot buffer area boundaries around the proposed borrow areas.

The Service received a report from Broward County, dated July 27, 2001, that provided an evaluation of the need for the T-groins, the erosion rates of the beach south of the inlet, and the sea turtle nesting activities in the proposed groin field. The report recommends three groins, instead of the ten originally proposed.

The Service attended a presentation by the County on July 31, 2001. The presentation provided an update of the project, the ongoing additional data surveys of the biological resources, and the projected completion date of the data surveys.

The Service provided, in an E-mail dated August 16, 2001, a request to the County to evaluate the sediment and turbidity monitoring program being used by Miami-Dade County and its applicability to the current project.

The Service attended the Corps' Alternative Formulation Briefing, which was held on August 29, 2001.

The Service received additional data from the County, dated September 6, 2001.

The Service met with the County on September 19, 2001, to discuss the turbidity and sediment monitoring programs and to discuss the status of the biological data.

The Service received additional data from the County, dated November 9, 2001. The data included biological survey reports, monitoring proposals, and project minimization objectives.

The Service met with Broward County on November 28, 2001, to review the monitoring data and to review the proposed changes in the project scope. The changes were made, based on the biological survey reports.

The Service received a revised monitoring plan from the County, dated December 17, 2001. The plan included monitoring of stress indicators, as well as, physical measurements of sedimentation rates.

The Service received correspondence from the County, dated December 18, 2001, deleting several of the proposed borrow areas and proposing changes in the boundaries of others.

The Service received additional information from the County, dated January 14, 2001, on sediment profiles in Borrow Area III.

Through preparation of this Biological Opinion, the Service is initiating formal consultation with the Corps.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The Army Corps of Engineers (Corps) published in the Federal Register (FR Vol. 64, No. 209, Friday October 29, 1999, pp 58381- 58382) its intent to prepare a Draft Environmental Impact Statement for the construction of appropriate reaches of Segments II and Segments III of the Broward County Shore Project (Noticed Project). The Noticed Project involves the placement of approximately 3.5 million cubic yards of material along 17.35 miles of Broward County's coast line. The Noticed Project was authorized by Public Law (PL) 79 Stat. 1073, Public Works - River and Harbor, which was passed in October 27, 1965. Three separate segments were identified in the authorizing document. The proposed action addresses only Segments II and III. Segment I is not included in the proposed action. Reevaluations of Sections II and III were also authorized by Section 156 of the Water Resource Development Act (WRDA) of 1976 (PL 99-62), as amended by Section 934 of the WRDA 1986 (PL 99-662). The reevaluations were completed in April 1994 and April 1991, respectively.

The Noticed Project would impact approximately 25 acres of nearshore hardbottom, would include the construction of 13 shore stabilization groins south of the south jetty of Port Everglades, and would require dredge material from seven borrow areas. Biological resource surveys noted significant benthic flora and fauna in the proposed project impact areas. Physical surveys of the borrow areas also noted sediment quality concerns with several of the sites. As a result of these concerns, the Noticed Project was reduced in size and scope (Revised Project).

The Revised Project (Figure 1) proposes impacts to 13.6 acres of nearshore hardbottom, proposes the construction of three groins, and proposes to dredge material from five borrow areas. The project also includes the removal of 18 to 20 derelict structures. The Revised Project will place approximately 2.5 million cubic yards of material along 11.8 miles of beach. Mitigation for nearshore hardbottom impacts is proposed by placing limestone boulders in similar nearshore areas. Mitigation will consist of the creation of artificial reef habitat at a 1:1 footprint ratio. Secondary impacts from turbidity and sediment plumes may also occur from project implementation. The Corps has proposed turbidity and sediment monitoring programs to document the occurrence of both short-term and long-term turbidity and sediment effects. The short-term monitoring program includes both preventative and corrective actions that can be implemented should resource effects occur. The long-term monitoring is a continuation of the County's current countywide sea turtle nest and reef monitoring program.

Segment II is from Hillsboro Inlet to Port Everglade; fill will be placed along beaches in southern Pompano Beach, Lauderdale-by-the-Sea, and northern and central Fort Lauderdale. In Segment III, which is from Port Everglades to the south County line, fill will be placed on beaches in John U. Lloyd Beach State Recreation Area, Dania Beach, Hollywood, and Hallandale Beach. Fill will be obtained from five discrete borrow areas located offshore of the central and northern portions of the County. The project also includes the installation of three groins on the downdrift shore of Port Everglades Inlet. The sections of beach in Dania, Hollywood, and Hallandale (DEP Monuments R98 to R128) are proposed for nourishment during the normally closed summer sea turtle nesting season (May 1 through October 31).

## STATUS OF THE SPECIES/CRITICAL HABITAT

### Species description

#### Loggerhead Sea Turtle

The loggerhead sea turtle (*Caretta caretta*), listed as a threatened species on July 28, 1978 (43 FR 32800), inhabits the continental shelves and estuarine environments along the margins of the Atlantic, Pacific, and Indian Oceans. Loggerhead sea turtles nest within the continental U.S. from Louisiana to Virginia. Major nesting concentrations in the U.S. are found on the coastal islands of North Carolina, South Carolina, and Georgia, and on the Atlantic and Gulf coasts of Florida (Hopkins and Richardson 1984). No critical habitat has been designated for the loggerhead sea turtle.

#### Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was federally listed as a protected species on July 28, 1978 (43 FR 32800). Breeding populations of the green turtle in Florida and along the Pacific Coast of Mexico are listed as endangered; all other populations are listed as threatened. The green turtle has a worldwide distribution in tropical and subtropical waters. Major green turtle nesting colonies in the Atlantic occur on Ascension Island, Aves Island, Costa Rica, and Surinam. Within the U.S., green turtles nest in small numbers in the U.S. Virgin Islands and Puerto Rico, and in larger numbers along the east coast of Florida, particularly in Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). Nesting also has been documented along the Gulf coast of Florida on Santa Rosa Island (Okaloosa and Escambia Counties) and from Pinellas County through Collier County (Florida Department of Environmental Protection, unpublished data). Green turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources, unpublished data). The green turtle also nests sporadically in North Carolina and South Carolina (North Carolina Wildlife Resources Commission, unpublished data; South Carolina Department of Natural Resources, unpublished data). Unconfirmed nesting of green turtles in Alabama has also been reported (Bon Secour National Wildlife Refuge, unpublished data). Critical habitat for the green sea turtle has been designated for the waters surrounding Culebra Island, Puerto Rico, and its outlying keys.

#### Leatherback Sea Turtle

The leatherback sea turtle (*Dermochelys coriacea*), listed as an endangered species on June 2, 1970 (35 FR 8491), nests on shores of the Atlantic, Pacific and Indian Oceans. Non-breeding animals have been recorded as far north as the British Isles and the Maritime Provinces of Canada and as far south as Argentina and the Cape of Good Hope (Pritchard 1992). Nesting grounds are distributed worldwide, with the Pacific Coast of Mexico supporting the world's largest known concentration of nesting leatherbacks. The largest nesting colony in the wider Caribbean region is found in French Guiana, but nesting occurs frequently, although in lesser numbers, from Costa Rica to Columbia and in Guyana, Surinam, and Trinidad

(National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992, National Research Council 1990a).

The leatherback regularly nests in the U.S. in Puerto Rico, the U.S. Virgin Islands, and along the Atlantic coast of Florida as far north as Georgia (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992). Leatherback turtles have been known to nest in Georgia, South Carolina, and North Carolina, but only on rare occasions (Murphy 1996, Winn 1996, Boettcher 1998). Leatherback nesting also has been reported on the northwest coast of Florida (LeBuff 1990; Florida Department of Environmental Protection, unpublished data); a false crawl (non-nesting emergence) has been observed on Sanibel Island (LeBuff 1990). Marine and terrestrial critical habitat for the leatherback sea turtle has been designated at Sandy Point on the western end of the island of St. Croix, U.S. Virgin Islands.

### Life history

#### Loggerhead Sea Turtle

Loggerheads are known to nest from one to seven times within a nesting season (Talbert *et al.* 1980, Richardson and Richardson 1982, Lenarz *et al.* 1981, among others); the mean is approximately 4.1 (Murphy and Hopkins 1984). The interval between nesting events within a season varies around a mean of about 14 days (Dodd 1988). Mean clutch size varies from about 100 to 126 along the southeastern United States coast (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). Nesting migration intervals of 2 to 3 years are most common in loggerheads, but the number can vary from 1 to 7 years (Dodd 1988). Age at sexual maturity is believed to be about 20 to 30 years (Turtle Expert Working Group 1998).

#### Green Sea Turtle

Green turtles deposit from one to nine clutches within a nesting season, but the overall average is about 3.3. The interval between nesting events within a season varies around a mean of about 13 days (Hirth 1997). Mean clutch size varies widely among populations. Average clutch size reported for Florida was 136 eggs in 130 clutches (Witherington and Ehrhart 1989). Only occasionally do females produce clutches in successive years. Usually 2, 3, 4, or more years intervene between breeding seasons (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a). Age at sexual maturity is believed to be 20 to 50 years (Hirth 1977).

#### Leatherback Sea Turtle

Leatherbacks nest an average of five to seven times within a nesting season, with an observed maximum of 11 (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1992). The interval between nesting events within a season is about 9 to 10 days. Clutch size averages 101 eggs on Hutchinson Island, Florida (Martin 1992). Nesting migration intervals of 2 to 3 years were observed in leatherbacks nesting on the Sandy Point National Wildlife Refuge, St. Croix, U.S. Virgin Islands (McDonald and Dutton 1996). Leatherbacks are believed to reach sexual maturity in 6 to 10 years (Zug and Parham 1996).

## Population dynamics

### Loggerhead Sea Turtle

Total estimated nesting in the Southeast is approximately 50,000 to 70,000 nests per year (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). In 1998, there were over 80,000 nests in Florida alone. From a global perspective, the southeastern U.S. nesting aggregation is of paramount importance to the survival of the species and is second in size only to that which nests on islands in the Arabian Sea off Oman (Ross 1982, Ehrhart 1989, National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). The status of the Oman colony has not been evaluated recently, but its location in a part of the world that is vulnerable to disruptive events (e.g., political upheavals, wars, catastrophic oil spills) is cause for considerable concern (Meylan *et al.* 1995). The loggerhead nesting aggregations in Oman, the southeastern U.S., and Australia account for about 88 percent of nesting worldwide (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). About 80 percent of loggerhead nesting in the southeastern U.S. occurs in six Florida counties (Brevard, Indian River, St. Lucie, Martin, Palm Beach, and Broward Counties) (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b). In the years 1999 and 2000 about 94 percent of the loggerhead nesting occurred in the 6 counties mentioned (Brevard south through Broward) (Florida Fish and Wildlife Conservation Commission 2001).

### Green Sea Turtle

About 200 to 1,100 females are estimated to nest on beaches in the continental U.S. In the U.S. Pacific, over 90 percent of nesting throughout the Hawaiian archipelago occurs at the French Frigate Shoals, where about 200 to 700 females nest each year. Elsewhere in the U.S. Pacific, nesting takes place at scattered locations in the Commonwealth of the Northern Marianas, Guam, and American Samoa. In the western Pacific, the largest green turtle nesting aggregation in the world occurs on Raine Island, Australia, where thousands of females nest nightly in an average nesting season. In the Indian Ocean, major nesting beaches occur in Oman where 6,000 to 20,000 females are reported to nest annually.

### Leatherback Sea Turtle

Recent estimates of global nesting populations indicate 26,000 to 43,000 nesting females annually (Spotila *et al.* 1996). The largest nesting populations at present occur in the western Atlantic in French Guiana (4,500 to 7,500 females nesting/year) and Colombia (estimated several thousand nests annually), and in the western Pacific in West Papua (formerly Irian Jaya) and Indonesia (about 600 to 650 females nesting/year). In the United States, small nesting populations occur on the Florida east coast (35 females/year), Sandy Point, U.S. Virgin Islands (50 to 100 females/year), and Puerto Rico (30 to 90 females/year).

## Status and distribution

### Loggerhead Sea Turtle

Genetic research (mtDNA) has identified four loggerhead nesting subpopulations in the western North Atlantic: (1) the Northern Subpopulation occurring from North Carolina to around Cape Canaveral, Florida (about 29° N.); (2) South Florida Subpopulation occurring from about 29° N. on Florida's east coast to Sarasota on Florida's west coast; (3) Northwest Florida Subpopulation occurring at Eglin Air Force Base and the beaches near Panama City; and (4) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (Bowen 1994, 1995; Bowen *et al.* 1993; Encalada *et al.* 1998). These data indicate that gene flow between these four regions is very low. If nesting females are extirpated from one of these regions, regional dispersal will not be sufficient to replenish the depleted nesting subpopulation. The Northern Subpopulation has declined substantially since the early 1970s, but most of that decline occurred prior to 1979. No significant trend has been detected in recent years (Turtle Expert Working Group 1998, 2000). Adult loggerheads of the South Florida Subpopulation have shown significant increases over the last 25 years, indicating that the population is recovering, although a trend could not be detected from the State of Florida's Index Nesting Beach Survey program from 1989 to 1998. Nesting surveys in the Northwest Florida and Yucatán Subpopulations have been too irregular to date to allow for a meaningful trend analysis (Turtle Expert Working Group 1998, 2000).

Threats include incidental take from channel dredging and commercial trawling, longline, and gill net fisheries; loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; watercraft strikes; and disease. There is particular concern about the extensive incidental take of juvenile loggerheads in the eastern Atlantic by longline fishing vessels from several countries.

### Green Sea Turtle

Total population estimates for the green turtle are unavailable, and trends based on nesting data are difficult to assess because of large annual fluctuations in numbers of nesting females. For instance, in Florida, where the majority of green turtle nesting in the southeastern U.S. occurs, estimates range from 200 to 1,100 females nesting annually. Populations in Surinam, and Tortuguero, Costa Rica, may be stable, but there is insufficient data for other areas to confirm a trend.

A major factor contributing to the green turtle's decline worldwide is commercial harvest for eggs and food. Fibropapillomatosis, a disease of sea turtles characterized by the development of multiple tumors on the skin and internal organs, is also a mortality factor and has seriously impacted green turtle populations in Florida, Hawaii, and other parts of the world. The tumors interfere with swimming, eating, breathing, vision, and reproduction, and turtles with heavy tumor burdens may die. Other threats include loss or degradation of nesting habitat from coastal development and beach armoring; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine

pollution and debris; watercraft strikes; and incidental take from channel dredging and commercial fishing operations.

### Leatherback Sea Turtle

Declines in leatherback nesting have occurred over the last two decades along the Pacific coasts of Mexico and Costa Rica. The Mexican leatherback nesting population, once considered to be the world's largest leatherback nesting population (65 percent of worldwide population), is now less than one percent of its estimated size in 1980. Spotila *et al.* (1996) recently estimated the number of leatherback sea turtles nesting on 28 beaches throughout the world from the literature and from communications with investigators studying those beaches. The estimated worldwide population of leatherbacks in 1995 was about 34,500 females on these beaches with a lower limit of about 26,200 and an upper limit of about 42,900. This is less than one third the 1980 estimate of 115,000. Leatherbacks are rare in the Indian Ocean and in very low numbers in the western Pacific Ocean. The largest population is in the western Atlantic. Using an age-based demographic model, Spotila *et al.* determined that leatherback populations in the Indian Ocean and western Pacific Ocean cannot withstand even moderate levels of adult mortality and that even the Atlantic populations are being exploited at a rate that cannot be sustained. They concluded that leatherbacks are on the road to extinction and further population declines can be expected unless we take action to reduce adult mortality and increase survival of eggs and hatchlings.

The crash of the Pacific leatherback population is believed primarily to be the result of exploitation by humans for the eggs and meat, as well as incidental take in numerous commercial fisheries of the Pacific. Other factors threatening leatherbacks globally include loss or degradation of nesting habitat from coastal development; disorientation of hatchlings by beachfront lighting; excessive nest predation by native and non-native predators; degradation of foraging habitat; marine pollution and debris; and watercraft strikes.

#### Analysis of the species likely to be affected

The proposed action has the potential to adversely affect nesting females, nests, and hatchlings within the proposed project area. The effects of the proposed action on sea turtles will be considered further in the remaining sections of this biological opinion. Potential effects include destruction of nests deposited within the boundaries of the proposed project, harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities, harm to nesting females and hatchlings by heavy equipment, entrapment of nesting females and hatchlings by groins, disorientation of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting, increased hatchling predation due to predator concentration at the groins, and behavior modification of nesting females due to escarpment formation within the project area during a nesting season resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs. The quality of the placed sand could affect the ability of female turtles to nest, the suitability of the nest incubation environment, and the ability of hatchlings to emerge from the nest. Critical habitat

has not been designated in the continental United States; therefore, the proposed action would not result in an adverse modification.

## ENVIRONMENTAL BASELINE

### Status of the species within the action area

Broward County is within the normal nesting areas of three species of sea turtles: the loggerhead sea turtle, the green sea turtle, and the leatherback sea turtle. Additionally, two of the seven hawksbill nests laid in the State of Florida between the years 1979 and 1998 were in Broward County, one nest in 1994 and one in 1997. Overall, 2,385 nests were recorded in 2001 over the 24-mile (38.6-km) beach from the Palm Beach/Broward County line south to the Broward/Dade County line. Total nests recorded for the previous four nesting seasons (2000, 1999, 1998, and 1997) were 2,942, 2,620, 2,857, and 2,285, respectively. The distribution of nests among species in 2001 was 2,320 loggerhead, 26 green, and 39 leatherback; in 2000 the distribution was 2,674 loggerhead, 255 green, and 13 leatherback; in 1999 the distribution was 2,584 loggerhead, 24 green, and 12 leatherback; in 1998 the distribution was 2,643 loggerhead, 200 green, and 14 leatherback; and for 1997 the distribution was 2,216 loggerhead, 29 green, and 42 leatherback.

Two profiles of nesting densities [nests per kilometer (km)] are present in Broward County. In the northern portion of the County (DNR monument R1 to R98), nest densities average 76.2, 96.4, 83.6, and 93.5 nests per km, for the years 2001, 2000, 1999, and 1998, respectively. For the southern portion of the County (DNR monument R98 to R128) densities average 17.1, 13.6, 19.1, and 13.4 nests per km for the years 2001, 2000, 1999, and 1998, respectively. Although no specific physical/biological parameters have been identified that would account for the two nest density profiles on the Broward County beaches, preliminary research suggests that nesting females are exiting the gulf stream at this point because of its close proximity to the coast (personal communication, L. Fisher 2000). Nesting densities and false crawls for each of the three species for the two nesting profiles are presented in Tables 1 and 2.

Table 1. Sea turtle nesting and false crawl data\* for Broward County Beaches from the north county line to Dania Beach Pier (DEP Monuments R1 to R98, a distance of 18.14 miles [29.2 km]), for the years 1995 to 2001.

Year	Number of <i>Caretta caretta</i> Nests	Number of <i>C. caretta</i> False Crawls	Number of <i>Chelonia mydas</i> Nests	Number of <i>C. mydas</i> False Crawls	Number of <i>Dermochelys coriacea</i> Nests	Number of <i>D. coriacea</i> False Crawls
1995	2428	2195	52	96	14	3
1996	2607	2783	109	137	2	0
1997	2141	2232	29	44	39	9
1998	2523	3807	196	253	12	5

1999	2406	2708	24	32	10	1
2000	2553	2636	248	239	13	4
2001	2170	2140	23	48	31	6

Table 2. Sea turtle nesting and false crawl data\* for Broward County Beaches from the Dania Beach Pier to the south county line (DEP Monuments R98 to R128, a distance of 5.84 miles [9.4 km]), for the years 1995 to 2001.

Year	Number of <i>Caretta caretta</i> Nests	Number of <i>C. caretta</i> False Crawls	Number of <i>Chelonia mydas</i> Nests	Number of <i>C. mydas</i> False Crawls	Number of <i>Dermochelys coriacea</i> Nests	Number of <i>D. coriacea</i> False Crawls
1995	139	135	0	1	1	2
1996	89	154	3	6	0	0
1997	75	150	0	4	1	1
1998	120	258	4	12	2	3
1999	178	306	0	0	2	0
2000	121	135	7	9	0	0
2001	150	168	3	1	8	1

\*Data provided by Broward County.

#### Groin Field Nesting Densities

Historical sea turtle nesting densities in the proposed groin field in John U. Lloyd Beach State Recreation Area range from a high of 18 nests in 1999 to a low of 2 nests in 2001. The proposed groin field extends from south of the jetty to approximately restroom #6 (RR6) (Figure 2), a distance of about 600 feet.

In general, Broward County beaches provide high quality nesting substrate for sea turtle nesting. However, because of the heavily developed nature of the County's coastline, the relative location of Highway A-1-A to the beach, and the extensive beach front lighting, all of which have the potential to negatively impact nesting sea turtles and their hatchlings, Broward County has instituted a nest relocation program. The program relocates all discovered, negatively impacted nests in portions of Pompano Beach, Deerfield Beach, Ft. Lauderdale, and Hollywood/Hallandale Beach to open-beach hatcheries that are located on darker less developed stretches of beach that are considered safe for hatchling emergence. Negatively impacted nests are those that are (1) susceptible to tidal inundation, (2) located near a highway or artificially lighted area defined as a beach area where a worker can see his shadow on a clear night, and/or (3) located in an area

subject to beach renourishment. The relocation program has been in operation since the inception of the County's sea turtle conservation program in 1978. The nest are relocated to hatcheries in Pompano Beach near Atlantic Boulevard; at the South Beach municipal parking lot in Ft. Lauderdale, and at North Beach Park in Hollywood. Nests in John U. Lloyd Beach State Recreation Area (DNR monument R86 to R97) are not relocated.

### Loggerhead Sea Turtle

The loggerhead sea turtle nesting and hatching season for Broward County extends from March 15 through November 30. Incubation ranges from about 45 to 95 days. The FWC's marine turtle permit holders conduct surveys of sea turtle nesting, nesting activity, and nest relocations each year during the nesting season throughout Broward County. The number of loggerhead sea turtle nests observed during the seven year period from 1995 to 2001 ranged from a low of 2,216 in 1997 to a high of 2,696 in 1996, with an average of 2,529.

### Green Sea Turtle

The green sea turtle nesting and hatching season for Broward County extends from May 1 through November 30. Incubation ranges from about 45 to 75 days. Nesting and false crawl data for green sea turtles in Broward County for each of the two nesting profiles for the years 1995 to 2001, are presented in Tables 1 and 2. The number of green sea turtle nests highs and lows are cyclic with an average of 189 nest for high years and 33 for low years. The pattern in Broward County is high nesting populations in even years and low nesting in odd years.

### Leatherback Sea Turtle

The leatherback sea turtle nesting and hatching season for Broward County extends from February 15 through November 15. Incubation ranges from about 55 to 75 days. Nesting and false crawl data for leatherback sea turtles in Broward County for each of the two nesting profiles for the years 1995 to 2001, are presented in Tables 1 and 2. The number of leatherback sea turtle nests during the seven year period from 1995 to 2001 ranged from a low of 2 in 1996 to a high of 40 in 1997, with an average of 19.

## EFFECTS OF THE ACTION

### Analyses for effects of the action

#### Beneficial Effects

The placement of sand on a beach with reduced dry fore-dune habitat may increase sea turtle nesting habitat if the placed sand is highly compatible (i.e., grain size, shape, color, etc.) with naturally occurring beach sediments in the area, and compaction and escarpment remediation measures are incorporated into the project. In addition, a nourished beach that is designed and constructed to mimic a natural beach system may be more stable than the eroding one it replaces, thereby benefitting sea turtles. The groin construction may provide stabilization to sands between the groins and provide nesting habitat where none currently exists.

## Direct Effects

Placement of sand on a beach in and of itself may not provide suitable nesting habitat for sea turtles. Although beach nourishment may increase the potential nesting area, significant negative impacts to sea turtles may result if protective measures are not incorporated during project construction. Nourishment and groin construction during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of eggs and hatchlings and, along with other mortality sources, may significantly impact the long-term survival of the species. For instance, projects conducted during the nesting and hatching season could result in the loss of sea turtles through disruption of adult nesting activity and by burial or crushing of nests or hatchlings. While a nest monitoring and egg relocation program or a nest mark and avoidance program would reduce these impacts, nests may be inadvertently missed (when crawls are obscured by rainfall, wind, and/or tides) or misidentified as false crawls during daily patrols. In addition, nests may be destroyed by operations at night prior to beach patrols being performed. Even under the best of conditions, about 7 percent of the nests can be misidentified as false crawls by experienced sea turtle nest surveyors (Schroeder 1994).

Potential adverse impacts during the project construction phase include disturbance of existing nests, which may have been missed, disturbance of females attempting to nest, and disorientation of emerging hatchlings. Heavy equipment will be required to install the groins, and this equipment will have to traverse the sandy beach to the project site, which could result in harm to nesting females, nests, and emerging hatchlings. Trenching, which is usually associated with groin construction will not be necessary, due to the highly eroded nature of the beach at the proposed construction site. All construction will occur upon the existing seabed.

Three permanent groins are proposed to be constructed on the south side of Port Everglades south jetty. Two T-groins and one spur are proposed. Following construction, the presence of groin has the potential to impact sea turtles in several ways. They may interfere with nesting turtle access to the beach, result in a change in beach profile and width (downdrift erosion, loss of sandy berms, and escarpment formation), trap hatchlings, and concentrate predators.

### 1. Nest relocation

Project construction, including both sand placement and groin construction, is likely to occur during the sea turtle nesting season, therefore, impacts due to sea turtle nest relocation is a possibility. Besides the potential for missing nests during a nest relocation program, there is a potential for eggs to be damaged by their movement, particularly if eggs are not relocated within 12 hours of deposition (Limpus *et al.* 1979). Nest relocation can have adverse impacts on incubation temperature (and hence sex ratios), gas exchange parameters, hydric environment of nests, hatching success, and hatchling emergence (Limpus *et al.* 1979, Ackerman 1980, Parmenter 1980, Spotila *et al.* 1983, McGehee 1990). Relocating nests into sands deficient in oxygen or moisture can result in mortality, morbidity, and reduced behavioral competence of hatchlings. Water availability is known to influence the incubation environment of the embryos and hatchlings of turtles with flexible-shelled eggs, which has been shown to affect nitrogen excretion (Packard *et al.* 1984), mobilization of calcium (Packard and Packard 1986), mobilization of yolk nutrients (Packard *et al.* 1985), hatchling size (Packard *et al.* 1981,

McGehee 1990), energy reserves in the yolk at hatching (Packard *et al.* 1988), and locomotory ability of hatchlings (Miller *et al.* 1987).

Comparisons of hatching success between relocated and *in situ* nests have noted significant variation ranging from a 21 percent decrease to a 9 percent increase for relocated nests (Florida Department of Environmental Protection, unpublished data). Comparisons of emergence success between relocated and *in situ* nests have also noted significant variation ranging from a 23 percent decrease to a 5 percent increase for relocated nests (Florida Department of Environmental Protection, unpublished data). A 1994 Florida Department of Environmental Protection study of hatching and emergence success of *in situ* and relocated nests at seven sites in Florida found that hatching success was lower for relocated nests in five of seven cases with an average decrease for all seven sites of 5.01 percent (range = 7.19 percent increase to 16.31 percent decrease). Emergence success was lower for relocated nests in all seven cases by an average of 11.67 percent (range = 3.6 to 23.36 percent) (Meylan 1995).

## 2. Equipment

The placement of pipelines, groin materials, and the use of heavy machinery or equipment on the beach during a construction project may also have adverse effects on sea turtles. They can create barriers to nesting females emerging from the surf and crawling up the beach, causing a higher incidence of false crawls and unnecessary energy expenditure. The equipment can also create impediments to hatchling sea turtles as they crawl to the ocean.

## 3. Artificial lighting

Visual cues are the primary sea-finding mechanism for hatchling sea turtles (Mrosovsky and Carr 1967, Mrosovsky and Shettleworth 1968, Dickerson and Nelson 1989, Witherington and Bjorndal 1991). When artificial lighting is present on or near the beach, it can misdirect hatchlings once they emerge from their nests and prevent them from reaching the ocean (Philbosian 1976; Mann 1977; Florida Department of Environmental Protection, unpublished data). In addition, a significant reduction in sea turtle nesting activity has been documented on beaches illuminated with artificial lights (Witherington 1992). Therefore, construction lights along a project beach and on the dredging vessel may deter females from coming ashore to nest, misdirect females trying to return to the surf after a nesting event, and misdirect emergent hatchlings from adjacent non-project beaches. Any source of bright lighting can profoundly affect the orientation of hatchlings, both during the crawl from the beach to the ocean and once they begin swimming offshore. Hatchlings attracted to light sources on dredging barges may not only suffer from interference in migration, but may also experience higher probabilities of predation to predatory fishes that are also attracted to the barge lights. This impact could be reduced by using the minimum amount of light necessary (may require shielding) or low pressure sodium lighting during project construction.

## 4. Entrapment/physical obstruction

Adult females approaching the nesting beach may encounter the groin structures and either go around them, abort nesting activities for that night, and/or move to another section of beach to nest. The groins will act as barriers between beach segments and also prevent nesting on the groin alignment. The groins could confuse or misorient nesting or hatchling turtles and prolong their time on the beach, making them vulnerable to predation, exhaustion, or dessication.

The physical obstruction of the T-heads may affect both adult female and hatchling sea turtles. Adult females may be deterred from approaching their preferred nesting locations because of the shore parallel barrier the T-heads pose. The groins and their T-heads may also serve as impediments to offshore migration by hatchlings. Howard and Davis (1999) found that 13 percent of hatchlings emerging from nests laid near T-head groins in Palm Beach County, Florida, encountered the groins on their trek to the ocean. In this case, the project design for sand placement around the groins was not properly followed. The project was designed to have a narrower fill section in the vicinity of the groins so the shore parallel T-heads would be seaward of the high water line and hatchlings would be able to swim over them. However, the groin section received more fill than expected which caused the high water line to be further seaward than expected. As a result, the T-heads trapped hatchlings due to the exposure of the T-heads above the high water line and the presence of artificial lighting in the vicinity of the groins which caused them to disorient in the direction of the T-heads. Therefore, if sand placement or accretion results in exposure of T-heads above the water's surface and/or artificial lighting problems exist in a groin construction area, hatchlings are likely to become trapped.

#### 5. Predator concentration

The presence of groins has the potential to attract and concentrate predatory fishes and provide perching spots for predatory birds, resulting in higher probabilities of hatchling predation as hatchlings enter the ocean.

### Indirect Effects

Many of the direct effects of beach nourishment and groin construction may persist over time and become indirect impacts. These indirect effects include increased susceptibility of relocated nests to catastrophic events, the consequences of potential increased beachfront development, changes in the physical characteristics of the beach, the formation of escarpments, future sand migration, accelerated downdrift erosion, and the impacts of debris on the beach from groin breakdown.

#### 1. Increased susceptibility to catastrophic events

Nest relocation may concentrate eggs in an area making them more susceptible to catastrophic events. Hatchlings released from concentrated areas also may be subject to greater predation rates from both land and marine predators, because the predators learn where to concentrate their efforts (Glenn 1998, Wyneken *et al.* 1998).

#### 2. Increased beachfront development

Pilkey and Dixon (1996) state that beach replenishment frequently leads to more development in greater density within shorefront communities that are then left with a future of further replenishment or more drastic stabilization measures. Dean (1999) also notes that the very existence of a beach nourishment project can encourage more development in coastal areas. Following completion of a beach nourishment project in Miami during 1982, investment in new and updated facilities substantially increased tourism there (National Research Council 1995). Increased building density immediately adjacent to the beach often resulted as older buildings were replaced by much larger ones that accommodated more beach users. Overall, shoreline management creates an upward spiral of initial protective measures resulting in more expensive

development which leads to the need for more and larger protective measures. Increased shoreline development may adversely affect sea turtle nesting success. Greater development may support larger populations of mammalian predators, such as foxes and raccoons, than undeveloped areas (National Research Council 1990a), and can also result in greater adverse effects due to artificial lighting, as discussed above.

### 3. Changes in the physical environment

Beach nourishment may result in changes in sand density (compaction), beach shear resistance (hardness), beach moisture content, beach slope, sand color, sand grain size, sand grain shape, and sand grain mineral content if the placed sand is dissimilar from the original beach sand (Nelson and Dickerson 1988a). These changes could result in adverse impacts on nest site selection, digging behavior, clutch viability, and emergence by hatchlings (Nelson and Dickerson 1987, Nelson 1988).

Beach compaction and unnatural beach profiles that may result from beach nourishment activities could negatively impact sea turtles regardless of the timing of projects. Very fine sand and/or the use of heavy machinery can cause sand compaction on nourished beaches (Nelson *et al.* 1987, Nelson and Dickerson 1988a). Significant reductions in nesting success (i.e., false crawls occurred more frequently) have been documented on severely compacted nourished beaches (Fletemeyer 1980, Raymond 1984, Nelson and Dickerson 1987, Nelson *et al.* 1987), and increased false crawls may result in increased physiological stress to nesting females. Sand compaction may increase the length of time required for female sea turtles to excavate nests and also cause increased physiological stress to the animals (Nelson and Dickerson 1988c). Nelson and Dickerson (1988b) concluded that, in general, beaches nourished from offshore borrow sites are harder than natural beaches, and while some may soften over time through erosion and may accretion of sand, others may remain hard for 10 years or more.

These impacts can be minimized by using suitable sand and by tilling compacted sand after project completion. The level of compaction of a beach can be assessed by measuring sand compaction using a cone penetrometer (Nelson 1987). Tilling of a nourished beach with a root rake may reduce the sand compaction to levels comparable to unnourished beaches. However, a pilot study by Nelson and Dickerson (1988c) showed that a tilled nourished beach will remain uncompacted for up to 1 year. Therefore, the Service requires multi-year (usually three years) beach compaction monitoring and, if necessary, tilling to ensure that project impacts on sea turtles are minimized.

A change in sediment color on a beach could change the natural incubation temperatures of nests in an area, which, in turn, could alter natural sex ratios. To provide the most suitable sediment for nesting sea turtles, the color of the nourished sediments must resemble the natural beach sand in the area. Natural reworking of sediments and bleaching from exposure to the sun would help to lighten dark nourishment sediments; however, the timeframe for sediment mixing and bleaching to occur could be critical to a successful sea turtle nesting season.

### 4. Escarpment formation

On nourished beaches, steep escarpments may develop along their water line interface as they adjust from an unnatural construction profile to a more natural beach profile (Coastal

Engineering Research Center 1984, Nelson *et al.* 1987). In addition, escarpments may develop on the crenulate beaches located between groins as the beaches equilibrate to their final positions. These escarpments can hamper or prevent access to nesting sites (Nelson and Blihovde 1998). Researchers have shown that female turtles coming ashore to nest can be discouraged by the formation of an escarpment, leading to situations where they choose marginal or unsuitable nesting areas to deposit eggs (e.g., in front of the escarpments, which often results in failure of nests due to prolonged tidal inundation). This impact can be minimized by leveling any escarpments prior to the nesting season.

#### 5. Downtide erosion

Groins, in conjunction with beach nourishment, can help stabilize U.S. East Coast barrier island beaches (Leonard *et al.* 1990). However, groins and breakwaters often result in accelerated beach erosion downdrift of the structures (Komar 1983, National Research Council 1987, U.S. Army Corps of Engineers 1992) and corresponding degradation of suitable sea turtle nesting habitat (National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991a, 1991b, 1992). Impacts first are noted and greatest changes are observed close to the structures, but effects eventually may extend great distances along the coast (Komar 1983). Beach nourishment only partly alleviates impacts of groin construction on downdrift beaches (Komar 1983).

Groins operate by blocking the natural littoral drift of sand (Kaufman and Pilkey 1979, Komar 1983). Once sand fills the updrift groin area, some littoral drift and sand deposition on adjacent downdrift beaches occurs due to spillover. But, groins often force the river of sand into deeper offshore water, and sand that previously would have been deposited on downdrift beaches is lost from the system (Kaufman and Pilkey 1979). However, in this instance, the Port Everglades inlet jetties have effectively blocked downdrift sand movement.

#### 6. Groin breakdown

As the groin structures fail and break apart, they spread debris on the beach, which may further impede nesting females from accessing suitable nesting sites (resulting in a higher incidence of false crawls) and trap hatchlings and nesting turtles (U.S. Fish and Wildlife Service 1991a, 1991b, 1992, 1993). As part of the proposed project, 18 to 20 derelict groins are proposed for removal.

### Species' response to the proposed action

#### Beach Nourishment

Ernest and Martin (1999) conducted a comprehensive study to assess the effects of beach nourishment on loggerhead sea turtle nesting and reproductive success. The following findings illustrate sea turtle responses to and recovery from a nourishment project. A significantly larger proportion of turtles emerging on nourished beaches abandoned their nesting attempts than turtles emerging on Control or pre-nourished beaches. This reduction in nesting success was most pronounced during the first year following project construction and is most likely the result of changes in physical beach characteristics associated with the nourishment project (e.g., beach profile, sediment grain size, beach compaction, frequency and extent of escarpments). During the first post-construction year, the time required for turtles to excavate an egg chamber on the

untilled, hard-packed sands of one treatment area increased significantly relative to Control and background conditions. However, in another treatment area, tilling was effective in reducing sediment compaction to levels that did not significantly prolong digging times. As natural processes reduced compaction levels on nourished beaches during the second post-construction year, digging times returned to background levels.

During the first post-construction year, nests on the nourished beaches were deposited significantly farther from both the toe of the dune and the tide line than nests on Control beaches. Furthermore, nests were distributed throughout all available habitat and were not clustered near the dune as they were in the Control. As the width of nourished beaches decreased during the second year, among-treatment differences in nest placement diminished. More nests were washed out on the wide, flat beaches of the nourished treatments than on the narrower steeply sloped beaches of the Control. This phenomenon persisted through the second post-construction year monitoring and resulted from the placement of nests near the seaward edge of the beach berm where dramatic profile changes, caused by erosion and scarping, occurred as the beach equilibrated to a more natural contour.

As with other beach nourishment projects, Ernest and Martin (1999) found that the principal effect of nourishment on sea turtle reproduction was a reduction in nesting success during the first year following project construction. Although most studies have attributed this phenomenon to an increase in beach compaction and escarpment formation, Ernest and Martin indicate that changes in beach profile may be more important. Regardless, as a nourished beach is reworked by natural processes in subsequent years and adjusts from an unnatural construction profile to a more natural beach profile, beach compaction and the frequency of escarpment formation decline, and nesting and nesting success return to levels found on natural beaches.

### Groins

Segment III of the project includes the construction of three groins (Figure 2), two T-head structures, and one spur. The two T-head structures will be constructed downdrift of the Port Everglades entrance. The spur will be connected on the south side of the south jetty. The beach immediately south of the Port Everglades entrance has been nourished on two previous occasions. The nourishments have been unsuccessful in maintaining a suitable protective and recreational beach. Therefore, the purpose of the groins is to stabilize the design shoreline and reduce the long-term sand losses at this location. The groins will be of rubble mound construction. The T-head structures will include a T-head at the seaward end. The spacing between the groin stems is approximately 280 feet, and the distance between the T-heads is about 150 feet. Once the sand fill between the groins equilibrates, the seaward limit of the groins will be situated about 60 to 80 feet eastward of the design mean high water shoreline.

According to Olsen Associates, Inc. (Olsen 1999), once a pocket beach has fully equilibrated between two appropriately designed T-head structures, the residual renourished shoreline produces excellent sea turtle nesting habitat. It becomes an area of reduced wave energy, is usually shallow, and is typically subject to less scarping and benching of the associated beach foreshore. The three groins proposed for placement in John U. Lloyd Beach State Recreation Area may affect sea turtles through potential entrapment of hatchlings in boulder spaces and

through an increase in the potential for fish predation on the young hatchlings that emerge from the nest. The groins also provide a positive benefit in providing nesting beach where there was none before.

As part of the proposed action, 18 to 20 derelict groins are proposed for removal. Four structures are located north of the Dania Beach Pier, the remainder are located south of the pier. All are proposed for removal during the nesting season to coincide with the nourishment actions proposed for the Hollywood/Hallandale Beach nourishment component. The removal of the structures provide a positive benefit, because the current structures have the potential to entrap hatchlings.

## CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. The Service is not aware of any cumulative effects in the project area.

## CONCLUSION

After reviewing the current status of the loggerhead, the leatherback, and the green sea turtle, the environmental baseline for the action area, the effects of the proposed beach nourishment, the effects of the groin construction, and the cumulative effects, it is the Service's biological opinion that the beach construction project, as proposed, is not likely to jeopardize the continued existence of these three species, and is not likely to destroy or adversely modify designated critical habitat. However, no critical habitat has been designated for the loggerhead, the leatherback, and the green sea turtle in the continental United States; therefore, none will be affected.

The Service anticipates 11.8 miles (62,304 linear feet) of nesting beach habitat could be affected as a result of the proposed beach nourishment and 0.1 mile (600 linear feet) of nesting habitat could be affected as a result of the proposed groin construction, which is less than one percent of the approximately 1,400 miles of available sea turtle nesting habitat in the southeastern U.S.

Research has shown that the principal effect of beach nourishment on sea turtle reproduction is a reduction in nesting success, and this reduction is most often limited to the first year following project construction. Research has also shown that the impacts of a nourishment project on sea turtle nesting habitat are typically short-term because a nourished beach will be reworked by natural processes in subsequent years, and beach compaction and the frequency of escarpment formation will decline. Research on the effects of groin construction on sea turtle reproduction is very limited, however, these studies have documented that the groins may alter sea turtle nesting events, that hatchlings may get trapped in the groin structures, and the structures may increase the presence of predatory fish in the groin area.

Although a variety of factors, including some that cannot be controlled, can influence how a beach nourishment and groin construction project will perform from an engineering perspective, measures can be implemented to minimize impacts to sea turtles.

## INCIDENTAL TAKE STATEMENT

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

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

## AMOUNT OR EXTENT OF TAKE

The Service anticipates 11.8 miles (62,304 linear feet) of nesting beach habitat could be taken as a result of the proposed beach nourishment and 0.1 mile (600 linear feet) of nesting habitat could be taken as a result of the proposed groin construction. The proposed beach nourishment includes approximately 6.0 miles (31,680 linear feet) scheduled for placement during the “normally closed” March 1 through October 31 summer nesting season, with the remainder of the nourishment, 5.8 miles (30,624 linear feet), scheduled for construction outside the closure period. The new groin construction and the derelict groin removals also expected to occur during the nesting season.

The take for the 5.8 miles (30,624 linear feet), scheduled for construction outside the closure period is expected to be in the form of: (1) destruction of all nests that may be constructed and eggs that may be deposited from March 1 through April 30 and from September 1 through September 30 and missed by a nest survey and egg relocation program within the boundaries of

the proposed project; (2) destruction of all nests deposited from October 1 through February 28 (or 29 as applicable) when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities; (5) misdirection of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (6) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (7) destruction of nests from escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service.

The take for the 6.0 miles (31,680 linear feet) scheduled for placement during the “normally closed” March 1 through October 31 summer nesting season and the take for the groin construction and removal is expected to be in the form of: (1) destruction of all nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities; (5) behavior modification of nesting females or hatchlings due to the presence of groins, which may act as barriers to movement; (6) behavior modification of nesting females if they dig into shallowly buried groins, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; (7) misdirection of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (8) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (9) destruction of nests from escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service.

Incidental take is anticipated for only the 11.8 miles (62,304 linear feet) of beach that have been identified for sand placement and the 0.1 mile (600 linear feet) of beach that have been identified for the construction of the groin field. The Service anticipates incidental take of sea turtles will be difficult to detect for the following reasons: (1) the turtles nest primarily at night and all nests are not found because [a] natural factors, such as rainfall, wind, and tides may obscure crawls and [b] human-caused factors, such as pedestrian and vehicular traffic, may obscure crawls, and result in nests being destroyed because they were missed during a nesting survey and egg relocation program; (2) the total number of hatchlings per undiscovered nest is unknown; (3) the reduction in percent hatching and emerging success per relocated nest over the natural nest site is unknown; (4) an unknown number of females may avoid the project beach and be forced to nest in a less than optimal area; (5) lights may misdirect an unknown number of hatchlings and cause death; and (6) escarpments may form and cause an unknown number of females from accessing a suitable nesting site. However, the level of take of these species can be anticipated by the

disturbance and renourishment of suitable turtle nesting beach habitat because: (1) turtles nest within the project site; (2) beach renourishment will likely occur during a portion of the nesting season; (3) groin construction will modify beach profile and width and is likely to increase the presence of escarpments; (4) the renourishment project will modify the incubation substrate, beach slope, and sand compaction; and (5) artificial lighting will deter and/or misdirect nesting females and hatchlings.

## EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species. Critical habitat has not been designated in the project area; therefore, the project will not result in destruction or adverse modification of critical habitat.

## REASONABLE AND PRUDENT MEASURES

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the loggerhead, the leatherback, and the green sea turtle.

For portions of the beach to be constructed outside the “normally closed” March 1 through October 31 summer nesting season (DEP Monuments R36 to R43, R51 to R72, and R86 to R92), the following reasonable and prudent measures are appropriate.

1. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence must be used on the project site.
2. Beach nourishment activities must not occur from March 1 through October 31, the period of peak sea turtle egg laying and egg hatching, to reduce the possibility of sea turtle nest burial or crushing of eggs.
3. If the beach nourishment project will be conducted during the period from March 1 through April 30, surveys for early nesting sea turtles must be conducted. If nests are constructed in the area of beach nourishment, the eggs must be relocated.
4. If the beach nourishment project will be conducted during the period from November 1 through November 30, surveys for late nesting sea turtles must be conducted. If nests are constructed in the area of beach nourishment, the eggs must be relocated.
5. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, beach compaction must be monitored and tilling must be conducted as required by March 1 to reduce the likelihood of impacting sea turtle nesting and hatching activities. The March 1 deadline is required to reduce impacts to leatherbacks that nest in greater frequency along the South Atlantic coast of Florida than elsewhere in the continental United States.

6. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, monitoring must be conducted to determine if escarpments are present and escarpments must be leveled as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.
7. The applicant must ensure that contractors doing the beach nourishment work fully understand the sea turtle protection measures detailed in this incidental take statement.
8. During the nesting season, construction equipment and pipes must be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.
9. During the early and late portions of the nesting season, lighting associated with the project must be minimized to reduce the possibility of disrupting and misdirecting nesting and/or hatchling sea turtles.

For portions of the beach to be constructed during the “normally closed” March 1 through October 31 summer nesting season (DEP Monuments R98 to R128), the groin construction, and derelict groin removals, the following reasonable and prudent measures are appropriate.

1. Beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence must be used on the project site.
2. If the beach nourishment project will be conducted during the sea turtle nesting season, surveys for nesting sea turtles must be conducted. If nests are constructed in the area of beach nourishment, the eggs must be relocated.
3. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, beach compaction must be monitored and tilling must be conducted as required by March 1 to reduce the likelihood of impacting sea turtle nesting and hatching activities. The March 1 deadline is required to reduce impacts to leatherbacks that nest in greater frequency along the South Atlantic coast of Florida than elsewhere in the continental United States. (NOTE: The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Also, out-year compaction monitoring and remediation are not required if placed material no longer remains on the beach.)
4. If the groin construction and removal project will be conducted during the sea turtle nesting season, sea turtle protection measures must be employed to minimize the likelihood of take.
5. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, monitoring must be conducted to determine if escarpments are present and escarpments must be leveled as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.

6. The applicant must ensure that contractors doing the beach nourishment work fully understand the sea turtle protection measures detailed in this incidental take statement.
7. During the sea turtle nesting season, construction equipment and materials must be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.
8. During the sea turtle nesting season, lighting associated with the project must be minimized to reduce the possibility of disrupting and misdirecting nesting and/or hatchling sea turtles.

## TERMS AND CONDITIONS

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

For portions of the beach to be constructed outside the “normally closed” March 1 through October 31 summer nesting season (DEP Monuments R36 to R43, R51 to R72, and R86 to R92), the following terms and conditions apply.

1. All fill material placed must be sand that is analogous to a native beach in the vicinity of the site that has not been affected by prior renourishment activities. The fill material must be equivalent in both coloration and grain size distribution to the native beach. All such fill material must be free of construction debris, rocks, or other foreign matter and must not contain, on average, greater than 10 percent fines (i.e., silt and clay) (passing the #230 sieve) and must not contain, on average, greater than 5 percent coarse gravel or cobbles, exclusive of shell material (retained by the #4 sieve).
2. Beach nourishment must be started after October 31 and be completed before March 1. During the March 1 through October 31 period, no construction equipment or pipes will be stored on the beach.
3. If the beach nourishment project will be conducted during the period from March 1 through April 30, daily early morning surveys for sea turtle nests must be conducted from March 1 through April 30 or until completion of the project (whichever is earliest), and eggs must be relocated per the following requirements.
  - 3a. Nesting surveys and egg relocations will only be conducted by personnel with prior experience and training in nesting survey and egg relocation procedures. Surveyors must have a valid FWC permit. Nesting surveys must be conducted daily between sunrise and 9 a.m. Surveys must 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.

3b. Only those nests that may be affected by construction activities will be relocated. Nests requiring relocation must 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. Nest relocations in association with construction activities must cease when construction activities no longer threaten nests. Nests deposited within areas where construction activities have ceased or will not occur for 65 days must be marked and left in place unless other factors threaten the success of the nest. Any nests left in the active construction zone must be clearly marked, and all mechanical equipment must avoid nests by at least 10 feet.

4. If the beach nourishment project will be conducted during the period from November 1 through November 30, daily early morning sea turtle nesting surveys must be conducted 65 days prior to project initiation and continue through September 30, and eggs must be relocated per the preceding requirements.

5. Immediately after completion of the beach nourishment project and prior to March 1 for 3 subsequent years, sand compaction must be monitored in the area of restoration in accordance with a protocol agreed to by the Service, the State regulatory agency, and the applicant. At a minimum, the protocol provided under 5a and 5b below must be followed. If required, the area must be tilled to a depth of 36 inches. All tilling activity must be completed prior to March 1. An annual summary of compaction surveys and the actions taken must be submitted to the Service. (NOTE: The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Also, out-year compaction monitoring and remediation are not required if placed material no longer remains on the beach.)

5a. Compaction sampling stations must be located at 500-foot intervals along the project area. One station must be at the seaward edge of the dune/bulkhead line (when material is placed in this area), and one station must be midway between the dune line and the high water line (normal wrack line).

At each station, the cone penetrometer will 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 lay over less compact layers. Replicates will 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 will 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.

5b. If the average value for any depth exceeds 500 pounds per square inch (psi) for any two or more adjacent stations, then that area must be tilled prior to March 1. 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 Fish and Wildlife Service will be required to determine if tilling is required. If a few values (5

percent) exceeding 500 psi are present randomly within the project area, tilling will not be required.

6. Visual surveys for escarpments along the project area must be made immediately after completion of the beach nourishment project and prior to March 1 for 3 subsequent years. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled to the natural beach contour by March 1. If the project is completed during the early part of the sea turtle nesting and hatching season (March 1 through April 30), escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. The Service must 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 must be submitted to the Service. (NOTE: Out-year escarpment monitoring and remediation are not required if placed material no longer remains on the dry beach.)

7. The applicant must arrange a meeting between representatives of the contractor, the Service, the FWC, and the permitted person responsible for egg relocation at least 30 days prior to the commencement of work on this project. At least 10 days advance notice must be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.

8. From March 1 through April 30 and November 1 through November 30, staging areas for construction equipment must be located off the beach to the maximum extent practicable. Nighttime storage of construction equipment not in use must 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 must be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system. Temporary storage of pipes must be off the beach to the maximum extent possible. Temporary storage of pipes on the beach must be in such a manner so as to impact the least amount of nesting habitat and must likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

9. During sand placement, from March 1 through April 30 and November 1 through November 30, direct lighting of the beach and near shore waters must be limited to the immediate construction area and must comply with safety requirements. Lighting on offshore or onshore equipment must 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 must be reduced to the minimum standard required by OSHA for General Construction areas, in order not to misdirect sea turtles. Shields must be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area (Figure 3).

10. A report describing the actions taken to implement the terms and conditions of this incidental take statement must be submitted to the South Florida Ecological Services Field Office, Vero Beach, within 60 days of completion of 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 nest surveys and relocation activities, descriptions and locations of self-release beach sites, nest survey and relocation results, and hatching success of nests.

11. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for egg relocation for the project must be notified so the eggs can be moved to a suitable relocation site.

12. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification must be made to the FWC Bureau of Marine Enforcement, toll free at (800) 342-5367 and to the South Florida Ecological Services Field Office, Vero Beach, at (561) 562-3909. Care should 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.

For portions of the beach to be constructed during the “normally closed” March 1 through October 31 summer nesting season (DEP Monuments R98 to R128), the following terms and conditions apply.

1. All fill material placed must be sand that is analogous to a native beach in the vicinity of the site that has not been affected by prior renourishment activities. The fill material must be equivalent in both coloration and grain size distribution to the native beach. All such fill material must be free of construction debris, rocks, or other foreign matter and must not contain, on average, greater than 10 percent fines (i.e., silt and clay) (passing the #230 sieve) and must not contain, on average, greater than 5 percent coarse gravel or cobbles, exclusive of shell material (retained by the #4 sieve).

2. Daily early morning surveys for sea turtle nests will be required if any portion of the beach nourishment and/or groin construction project occurs during the period from March 1 through November 30. Nesting surveys must be initiated 65 days prior to nourishment activities or by March 1, whichever is later. Nesting surveys must continue through the end of the project or through September 30, whichever is earlier. If nests are constructed in areas where they may be affected by beach nourishment activities, eggs must be relocated per the following requirements.

2a. Nesting surveys and egg relocations will only be conducted by personnel with prior experience and training in nesting survey and egg relocation procedures. Surveyors must have a valid Florida Fish and Wildlife Conservation Commission permit. Nesting surveys must be conducted daily between sunrise and 9 a.m. Surveys must be performed in such a manner so as to ensure that beach nourishment activity does not occur in any location prior to completion of the necessary sea turtle protection measures.

2b. Only those nests that may be affected by beach nourishment activities will be relocated unless otherwise permitted by the State for conservation purposes. Nests requiring relocation must 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. Nest relocations in association with beach nourishment activities must cease when beach nourishment activities no longer threaten nests. Nests deposited within areas where beach nourishment activities have ceased or will not occur for 65 days must be marked and left in place unless other factors threaten the success of the nest. Any nests left in the active construction zone must be clearly marked, and all mechanical equipment must avoid nests by at least 10 feet.

2c. Nests will not be relocated for groin construction purposes unless beach nourishment activities are in progress or will be starting within 65 days. Nests deposited within areas where beach nourishment activities have ceased or will not occur for 65 days must be marked and left in place unless other factors threaten the success of the nest. Any nests left in the groin construction area must be clearly marked. Nests will be marked and the actual location of the clutch determined. A circle with a radius of 10 feet, centered at the clutch, will be marked by stake and survey tape or string. No construction activities will enter this circle and no adjacent construction that might directly or indirectly disturb the area within the staked circle will be allowed.

3. Immediately after completion of the beach nourishment project and prior to March 1 for 3 subsequent years, sand compaction must be monitored in the area of restoration in accordance with a protocol agreed to by the Service, the State regulatory agency, and the applicant. At a minimum, the protocol provided under 3a and 3b below must be followed. If required, the area must be tilled to a depth of 36 inches. All tilling activity must be completed prior to March 1. An annual summary of compaction surveys and the actions taken must be submitted to the Service. (NOTE: The requirement for compaction monitoring can be eliminated if the decision is made to till regardless of post-construction compaction levels. Also, out-year compaction monitoring and remediation are not required if placed material no longer remains on the beach.)

3a. Compaction sampling stations must be located at 500-foot intervals along the project area. One station must be at the seaward edge of the dune/bulkhead line (when material is placed in this area), and one station must be midway between the dune line and the high water line (normal wrack line). At each station, the cone penetrometer will 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 lay over less compact layers. Replicates will 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 will 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.

3b. If the average value for any depth exceeds 500 pounds per square inch (psi) for any two or more adjacent stations, then that area must be tilled prior to March 1. 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 Fish and Wildlife Service will be required to determine if tilling is required. If a few values (5 percent) exceeding 500 psi are present randomly within the project area, tilling will not be required.

4. Visual surveys for escarpments along the project area must be made immediately after completion of the beach nourishment project and prior to March 1 for 3 subsequent years. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled to the natural beach contour by March 1. If the project is completed during the early part of the sea turtle nesting and hatching season (March 1 through April 30), escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. The Service must 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 must be submitted to the Service. (NOTE: Out-year escarpment monitoring and remediation are not required if placed material no longer remains on the dry beach.)

5. The applicant must arrange a meeting between representatives of the contractor, the Service, the FWC, and the permitted person responsible for nest marking and/or egg relocation at least 30 days prior to the commencement of work on this project. At least 10 days advance notice must be provided prior to conducting this meeting. This will provide an opportunity for explanation and/or clarification of the sea turtle protection measures.

6. From March 1 through November 30, staging areas for beach nourishment and groin construction and removal equipment must be located off the beach to the maximum extent practicable. Nighttime storage of construction equipment and materials not in use must be off the beach to minimize disturbance to sea turtle nesting and hatching activities. In addition, all construction pipes and materials that are placed on the beach must be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system. Temporary storage of pipes and other construction materials must be off the beach to the maximum extent possible. Temporary storage of pipes on the beach must be in such a manner so as to impact the least amount of nesting habitat and must likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

7. During groin construction and removal, no temporary lighting of the construction area is authorized at anytime during the sea turtle nesting season from April 1 through November 30 with the following exception. Lighting will be allowed if safety lighting is required at any excavated trenches that must remain on the beach at night. This lighting must be limited to

the immediate construction area only and must be the minimal lighting necessary to comply with safety requirements.

8. During sand placement, from March 1 through November 30, direct lighting of the beach and near shore waters must be limited to the immediate construction area and must comply with safety requirements. Lighting on offshore or onshore equipment must 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 must be reduced to the minimum standard required by OSHA for General Construction areas, in order not to mis-direct sea turtles. Shields must be affixed to the light housing and be large enough to block light from all lamps from being transmitted outside the construction area (Figure 3).

9. No permanent exterior lighting will be installed in association with this construction project.

10. If sand placement or sand accretion results in exposure of the T-heads above the water's surface and/or artificial lighting problems exist in the vicinity of the groin structures, and it is determined that hatchlings are being trapped in the corners of the T-heads as a result, the T-head portions of the groins must be removed immediately.

11. In the event a groin structure fails or begins to disintegrate, all debris and structural material must be removed from the nesting beach area and deposited off-beach immediately. If maintenance of a groin structure is required during the period from March 1 through November 30, no work will be initiated without prior coordination with the South Florida Ecological Services Office.

12. The groin system must be removed if it is determined to not be effective or to be causing a significant adverse impact to the beach and dune system.

13. A report describing the actions taken to implement the terms and conditions of this incidental take statement must be submitted to the South Florida Ecological Services Office, Vero Beach, within 60 days of completion of 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 nest surveys, marking, and relocation activities; descriptions and locations of self-release beach sites; nest survey, marking, and relocation results; and hatching and emerging success of nests.

14. In the event a sea turtle nest is excavated during construction activities, the permitted person responsible for nest marking and/or egg relocation for the project must be notified so the eggs can be moved to a suitable relocation site.

15. Upon locating a sea turtle adult, hatchling, or egg harmed or destroyed as a direct or indirect result of the project, notification must be made to the FWC Bureau of Marine Species, toll free at (888) 404-FWCC (3922) and to the South Florida Ecological Services Field Office, Vero Beach, at (561) 562-3909. Care should 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.

## Summary

The Service believes that incidental take will be limited to the 11.8 miles (62,304 linear feet) of beach that have been identified for sand placement and the 0.1 mile (600 linear feet) of beach that have been identified for the construction of the groin field and the removal of the 18 to 20 derelict groins. 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 the following types of incidental take will result from the proposed action: (1) destruction of all nests that may be constructed and eggs that may be deposited and missed by a nest survey and egg relocation program within the boundaries of the proposed project; (2) destruction of all nests deposited during the period when a nest survey and egg relocation program is not required to be in place within the boundaries of the proposed project; (3) reduced hatching success due to egg mortality during relocation and adverse conditions at the relocation site; (4) harassment in the form of disturbing or interfering with female turtles attempting to nest within the construction area or on adjacent beaches as a result of construction activities and/or groin presence; (5) behavior modification of nesting females or hatchlings due to the presence of the groins which may act as barriers to movement; (6) behavior modification of nesting females if they dig into shallowly buried groins, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; (7) misdirection of hatchling turtles on beaches adjacent to the construction area as they emerge from the nest and crawl to the water as a result of project lighting; (8) behavior modification of nesting females due to escarpment formation within the project area during a nesting season, resulting in false crawls or situations where they choose marginal or unsuitable nesting areas to deposit eggs; and (9) destruction of nests from escarpment leveling within a nesting season when such leveling has been approved by the Fish and Wildlife Service.

The amount or extent of incidental take for sea turtles will be considered exceeded if the project results in more than a one-time placement of sand on the 11.8 miles (62,304 linear feet) of beach and the one time construction of the groin field in the 0.1 mile (600 linear feet) of beach that have been identified for the construction of the groin field. The amount or extent of incidental take will also be considered exceeded if the project results in more than the removal of 20 derelict groins. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Corps must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

## 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 sea turtle nesting and hatching season.
2. Appropriate native salt-resistant dune vegetation should be established on the restored dunes. The Florida Department of Environmental Protection, Office of Beaches and Coastal Systems, can provide technical assistance on the specifications for design and implementation.
3. Surveys for nesting success of sea turtles should be continued for a minimum of 3 years following beach nourishment to determine whether sea turtle nesting success has been adversely impacted.
4. Educational signs should be placed, where appropriate, at beach access points explaining the importance of the area to sea turtles and/or the life history of sea turtle species that nest in the area.

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

#### REINITIATION - CLOSING STATEMENT

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.

Should you have additional questions or require clarification, please contact Allen Webb at (772) 562-3909, extension 246.

Sincerely yours,



*For* James J. Slack  
Field Supervisor  
South Florida Ecological Services Office

cc.

DEP, Tallahassee, FL (Stacy Roberts)

EPA, West Palm Beach, FL

FWC, Tallahassee, FL (Robbin Trindell)

FWC, Vero Beach, FL

NMFS, Habitat Conservation Division, Miami, FL

NMFS, Protected Resources Division, St. Petersburg, FL

Service, Jacksonville, FL (Sandy MacPherson)

## LITERATURE CITED

- Ackerman, R.A. 1980. Physiological and ecological aspects of gas exchange by sea turtle eggs. *American Zoologist* 20:575-583.
- Boettcher, R. 1998. Personal communication. Biologist. North Carolina Wildlife Resources Commission. Marshallberg, North Carolina.
- Bowen, B.W. 1994. Letter dated November 17, 1994, to Sandy MacPherson, National Sea Turtle Coordinator, U.S. Fish and Wildlife Service, Jacksonville, Florida. University of Florida. Gainesville, Florida.
- Bowen, B.W. 1995. Letter dated October 26, 1995, to Sandy MacPherson, National Sea Turtle Coordinator, U.S. Fish and Wildlife Service, Jacksonville, Florida. University of Florida. Gainesville, Florida.
- Bowen, B., J.C. Avise, J.I. Richardson, A.B. Meylan, D. Margaritoulis, and S.R. Hopkins-Murphy. 1993. Population structure of loggerhead turtles (*Caretta caretta*) in the northwestern Atlantic Ocean and Mediterranean Sea. *Conservation Biology* 7(4):834-844.
- Coastal Engineering Research Center. 1984. Shore protection manual, volumes I and II. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Dean, C. 1999. *Against the tide: the battle for America's beaches*. Columbia University Press; New York, New York.
- Dickerson, D.D. and D.A. Nelson. 1989. Recent results on hatchling orientation responses to light wavelengths and intensities. Pages 41-43 *in* Eckert, S.A., K.L. Eckert, and T.H. Richardson (compilers). *Proceedings of the 9th Annual Workshop on Sea Turtle Conservation and Biology*. NOAA Technical Memorandum NMFS-SEFC-232.
- Dodd, C.K., Jr. 1988. Synopsis of the biological data on the loggerhead sea turtle *Caretta caretta* (Linnaeus 1758). U.S. Fish and Wildlife Service, Biological Report 88(14).
- Ehrhart, L.M. 1989. Status report of the loggerhead turtle. Pages 122-139 *in* Ogren, L., F. Berry, K. Bjorndal, H. Kumpf, R. Mast, G. Medina, H. Reichart, and R. Witham (editors). *Proceedings of the 2nd Western Atlantic Turtle Symposium*. NOAA Technical Memorandum NMFS-SEFC-226.
- Encalada, S.E., K.A. Bjorndal, A.B. Bolten, J.C. Zurita, B. Schroeder, E. Possardt, C.J. Sears, and B.W. Bowen. 1998. Population structure of loggerhead turtle (*Caretta caretta*) nesting colonies in the Atlantic and Mediterranean as inferred from mitochondrial DNA control region sequences. *Marine Biology* 130:567-575.

- Ernest, R.G. and R.E. Martin. 1999. Martin County beach nourishment project: sea turtle monitoring and studies. 1997 annual report and final assessment. Unpublished report prepared for the Florida Department of Environmental Protection.
- Fletemeyer, J. 1980. Sea turtle monitoring project. Unpublished report prepared for the Broward County Environmental Quality Control Board, Florida.
- Glenn, L. 1998. The consequences of human manipulation of the coastal environment on hatchling loggerhead sea turtles (*Caretta caretta*, L.). Pages 58-59 in Byles, R., and Y. Fernandez (compilers). Proceedings of the Sixteenth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-412.
- Hirth, H.F. 1997. Synopsis of the biological data on the green turtle *Chelonia mydas* (Linnaeus 1758). U.S. Fish and Wildlife Service, Biological Report 97(1).
- Hopkins, S.R. and J.I. Richardson (editors). 1984. Recovery plan for marine turtles. National Marine Fisheries Service, St. Petersburg, Florida.
- Howard, B. and P. Davis. 1999. Sea turtle nesting activity at Ocean Ridge in Palm Beach County, Florida, 1999. Unpublished report prepared for the Palm Beach County Department of Environmental Resources Management, West Palm Beach, Florida.
- Kaufman, W. and O. Pilkey. 1979. The beaches are moving. Anchor Press/Doubleday; Garden City, New York.
- Komar, P.D. 1983. Coastal erosion in response to the construction of jetties and breakwaters. Pages 191-204 in Komar, P.D. (editor). CRC Handbook of Coastal Processes and Erosion. CRC Press; Boca Raton, Florida.
- Leonard, L.A., T.D. Clayton, and O.H. Pilkey. 1990. An analysis of replenished beach design parameters on U.S. East Coast barrier islands. *Journal of Coastal Research* 6(1):15-36.
- Lenarz, M.S., N.B. Frazer, M.S. Ralston, and R.B. Mast. 1981. Seven nests recorded for loggerhead turtle (*Caretta caretta*) in one season. *Herpetological Review* 12(1):9.
- Limpus, C.J., V. Baker, and J.D. Miller. 1979. Movement induced mortality of loggerhead eggs. *Herpetologica* 35(4):335-338.
- Mann, T.M. 1977. Impact of developed coastline on nesting and hatchling sea turtles in southeastern Florida. M.S. thesis. Florida Atlantic University, Boca Raton, Florida.
- Martin, E. 1992. Personal communication. Biologist. Ecological Associates, Inc. Jensen Beach, Florida.

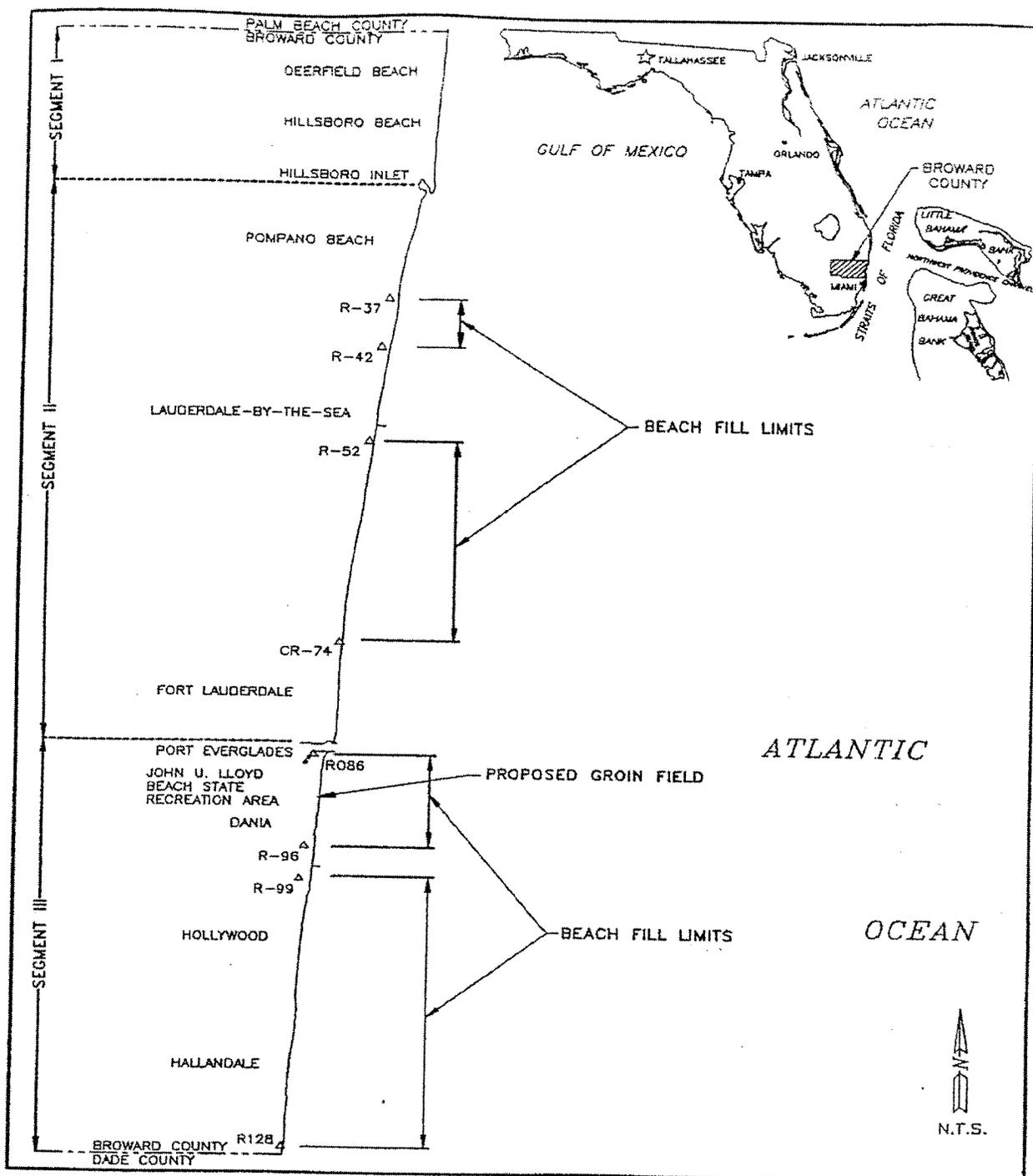
- McDonald, D.L. and P.H. Dutton. 1996. Use of PIT tags and photoidentification to revise remigration estimates of leatherback turtles (*Dermochelys coriacea*) nesting in St. Croix, U.S. Virgin Islands, 1979-1995. *Chelonian Conservation and Biology* 2(2):148-152.
- McGehee, M.A. 1990. Effects of moisture on eggs and hatchlings of loggerhead sea turtles (*Caretta caretta*). *Herpetologica* 46(3):251-258.
- Meylan, A. 1995. Fascimile dated April 5, 1995, to Sandy MacPherson, National Sea Turtle Coordinator, U.S. Fish and Wildlife Service, Jacksonville, Florida. Florida Department of Environmental Protection. St. Petersburg, Florida.
- Miller, K., G.C. Packard, and M.J. Packard. 1987. Hydric conditions during incubation influence locomotor performance of hatchling snapping turtles. *Journal of Experimental Biology* 127:401-412.
- Mrosovsky, N. and A. Carr. 1967. Preference for light of short wavelengths in hatchling green sea turtles (*Chelonia mydas*), tested on their natural nesting beaches. *Behavior* 28:217-231.
- Mrosovsky, N. and S.J. Shettleworth. 1968. Wavelength preferences and brightness cues in water finding behavior of sea turtles. *Behavior* 32:211-257.
- Murphy, S. 1996. Personal communication. Biologist. South Carolina Department of Natural Resources. Charleston, South Carolina.
- Murphy, T.M. and S.R. Hopkins. 1984. Aerial and ground surveys of marine turtle nesting beaches in the southeast region. Unpublished report prepared for the National Marine Fisheries Service.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991a. Recovery plan for U.S. population of Atlantic green turtle (*Chelonia mydas*). National Marine Fisheries Service, Washington, D.C.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1991b. Recovery plan for U.S. population of loggerhead turtle (*Caretta caretta*). National Marine Fisheries Service, Washington, D.C.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1992. Recovery plan for leatherback turtles (*Dermochelys coriacea*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, Washington, D.C.
- National Research Council. 1990a. Decline of the sea turtles: causes and prevention. National Academy Press; Washington, D.C.
- National Research Council. 1990b. Managing coastal erosion. National Academy Press; Washington, D.C.

- National Research Council. 1995. Beach nourishment and protection. National Academy Press; Washington, D.C.
- Nelson, D.A. 1987. The use of tilling to soften nourished beach sand consistency for nesting sea turtles. Unpublished report of the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Nelson, D.A. 1988. Life history and environmental requirements of loggerhead turtles. U.S. Fish and Wildlife Service Biological Report 88(23). U.S. Army Corps of Engineers TR EL-86-2 (Rev.).
- Nelson, D.A. and B. Blihovde. 1998. Nesting sea turtle response to beach scarps. Page 113 *in* Byles, R., and Y. Fernandez (compilers). Proceedings of the Sixteenth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-412.
- Nelson, D.A. and D.D. Dickerson. 1987. Correlation of loggerhead turtle nest digging times with beach sand consistency. Abstract of the 7th Annual Workshop on Sea Turtle Conservation and Biology.
- Nelson, D.A. and D.D. Dickerson. 1988a. Effects of beach nourishment on sea turtles. *In* Tait, L.S. (editor). Proceedings of the Beach Preservation Technology Conference '88. Florida Shore & Beach Preservation Association, Inc., Tallahassee, Florida.
- Nelson, D.A. and D.D. Dickerson. 1988b. Hardness of nourished and natural sea turtle nesting beaches on the east coast of Florida. Unpublished report of the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Nelson, D.A. and D.D. Dickerson. 1988c. Response of nesting sea turtles to tilling of compacted beaches, Jupiter Island, Florida. Unpublished report of the U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Nelson, D.A., K. Mauck, and J. Fletemeyer. 1987. Physical effects of beach nourishment on sea turtle nesting, Delray Beach, Florida. Technical Report EL-87-15. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.
- Packard, G.C., M.J. Packard, and T.J. Boardman. 1984. Influence of hydration of the environment on the pattern of nitrogen excretion by embryonic snapping turtles (*Chelydra serpentina*). *Journal of Experimental Biology* 108:195-204.
- Packard, G.C., M.J. Packard, and W.H.N. Gutzke. 1985. Influence of hydration of the environment on eggs and embryos of the terrestrial turtle *Terrapene ornata*. *Physiological Zoology* 58(5):564-575.
- Packard, G.C., M.J. Packard, T.J. Boardman, and M.D. Ashen. 1981. Possible adaptive value of water exchange in flexible-shelled eggs of turtles. *Science* 213:471-473.

- Packard G.C., M.J. Packard, K. Miller, and T.J. Boardman. 1988. Effects of temperature and moisture during incubation on carcass composition of hatchling snapping turtles (*Chelydra serpentina*). *Journal of Comparative Physiology B* 158:117-125.
- Packard, M.J. and G.C. Packard. 1986. Effect of water balance on growth and calcium mobilization of embryonic painted turtles (*Chrysemys picta*). *Physiological Zoology* 59(4):398-405.
- Parmenter, C.J. 1980. Incubation of the eggs of the green sea turtle, *Chelonia mydas*, in Torres Strait, Australia: the effect of movement on hatchability. *Australian Wildlife Research* 7:487-491.
- Philbosian, R. 1976. Disorientation of hawksbill turtle hatchlings (*Eretmochelys imbricata*) by stadium lights. *Copeia* 1976:824.
- Pilkey, O.H. and K.L. Dixon. 1996. *The Corps and the shore*. Island Press; Washington, D.C.
- Pritchard, P.C.H. 1992. Leatherback turtle *Dermochelys coriacea*. Pages 214-218 in Moler, P.E. (editor). *Rare and Endangered Biota of Florida, Volume III*. University Press of Florida; Gainesville, Florida.
- Raymond, P.W. 1984. The effects of beach restoration on marine turtles nesting in south Brevard County, Florida. M.S. thesis. University of Central Florida, Orlando, Florida.
- Richardson, J.I. and T.H. Richardson. 1982. An experimental population model for the loggerhead sea turtle (*Caretta caretta*). Pages 165-176 in Bjorndal, K.A. (editor). *Biology and Conservation of Sea Turtles*. Smithsonian Institution Press; Washington, D.C.
- Ross, J.P. 1982. Historical decline of loggerhead, ridley, and leatherback sea turtles. Pages 189-195 in Bjorndal, K.A. (editor). *Biology and Conservation of Sea Turtles*. Smithsonian Institution Press; Washington, D.C.
- Schroeder, B.A. 1994. Florida index nesting beach surveys: are we on the right track? Pages 132-133 in Bjorndal, K.A., A.B. Bolten, D.A. Johnson, and P.J. Eliazar (compilers). *Proceedings of the 14th Annual Symposium on Sea Turtle Biology and Conservation*. NOAA Technical Memorandum NMFS-SEFSC-351.
- Spotila, J.R., E.A. Standora, S.J. Morreale, G.J. Ruiz, and C. Puccia. 1983. Methodology for the study of temperature related phenomena affecting sea turtle eggs. U.S. Fish and Wildlife Service Endangered Species Report 11.
- Spotila, J.R., A.E. Dunham, A.J. Leslie, A.C. Steyermark, P.T. Plotkin, and F.V. Paladino. 1996. Worldwide population decline of *Dermochelys coriacea*: are leatherback turtles going extinct? *Chelonian Conservation and Biology* 2(2):290-222.

- Talbert, O.R., Jr., S.E. Stancyk, J.M. Dean, and J.M. Will. 1980. Nesting activity of the loggerhead turtle (*Caretta caretta*) in South Carolina I: a rookery in transition. *Copeia* 1980(4):709-718.
- Turtle Expert Working Group. 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409.
- Turtle Expert Working Group. 2000. Assessment update for the Kemp's ridley and loggerhead sea turtle populations in the western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-444.
- Winn, B. 1996. Personal communication. Biologist. Georgia Department of Natural Resources. Brunswick, Georgia.
- Witherington, B.E. 1992. Behavioral responses of nesting sea turtles to artificial lighting. *Herpetologica* 48:31-39.
- Witherington, B.E. and K.A. Bjorndal. 1991. Influences of artificial lighting on the seaward orientation of hatchling loggerhead turtles (*Caretta caretta*). *Biological Conservation* 55:139-149.
- Witherington, B.E. and L.M. Ehrhart. 1989. Status and reproductive characteristics of green turtles (*Chelonia mydas*) nesting in Florida. Pages 351-352 in Ogren, L., F. Berry, K. Bjorndal, H. Kumpf, R. Mast, G. Medina, H. Reichart, and R. Witham (editors). Proceedings of the Second Western Atlantic Turtle Symposium. NOAA Technical Memorandum NMFS-SEFC-226.
- Wyneken, J., L. DeCarlo, L. Glenn, M. Salmon, D. Davidson, S. Weege., and L. Fisher. 1998. On the consequences of timing, location and fish for hatchlings leaving open beach hatcheries. Pages 155-156 in Byles, R. and Y. Fernandez (compilers). Proceedings of the Sixteenth Annual Symposium on Sea Turtle Biology and Conservation. NOAA Technical Memorandum NMFS-SEFSC-412.
- Zug, G.R. and J.F. Parham. 1996. Age and growth in leatherback turtles, *Dermochelys coriacea* (Testidines: Dermochelyidae): a skeletochronological analysis. *Chelonian Conservation and Biology* 2(2):244-249.

Figure 1



BROWARD COUNTY  
LOCATION MAP  
AND  
SEGMENTS II AND III BEACH FILL LIMITS

Figure 2

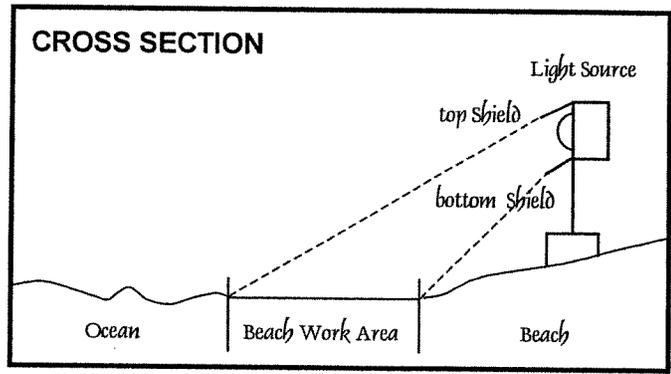
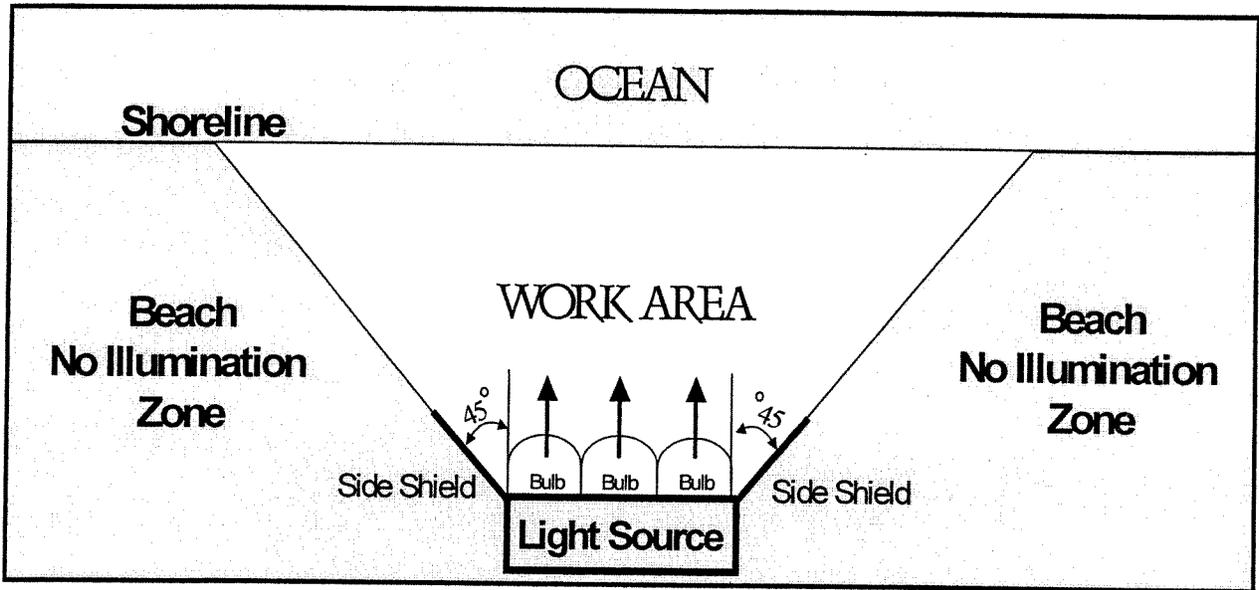


Location of Reaches for Sea Turtle Nesting Data

olsen associates, inc.

Figure 3

# BEACH LIGHTING SCHEMATIC





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, FL 33702  
(727) 570-5312, FAX 570-5517

F/SER3:JBM

MAR 10 2000

Mr. James C. Duck  
Chief, Planning Division  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Duck:

This responds to your letter dated February 28, 2000 concerning the renourishment of 17.35 miles of coastline in Broward County, Florida. The proposed project will involve placement of approximately 3.5 million cubic yards of material from Hillsboro Inlet to south county line along the beaches in southern Pompano, Lauderdale-By-The-Sea, northern and central Fort Lauderdale, John U. Lloyd Beach State Recreation Area, Dania Beach, Hollywood, and Hallandale Beach. A hopper dredge will be used to obtain fill from borrow areas located  $\frac{3}{4}$  - to  $1\frac{1}{4}$ -miles offshore.

The National Marine Fisheries Service (NMFS) concurs with your determination of no adverse effects to listed species under NMFS purview if the terms and conditions of the biological opinion (BO), issued under section 7 of the Endangered Species Act (ESA) by NMFS in 1995, and amended on September 25, 1997, are adhered to. These BOs analyzed the effects of hopper dredging in channels and borrow areas and concluded that their use would not jeopardize the continued existence of species of sea turtles protected by the ESA. NMFS believes the regional BOs adequately address the work being proposed by this project.

This concludes consultation responsibilities under section 7 of the ESA. Consultation should be reinitiated if new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat determined that may be affected by the proposed activity.

If you have any questions or concerns, please contact Eric Hawk, fishery biologist, at the number listed above.

Sincerely,

*Charles A. Orant*

*for* William T. Hogarth, Ph.D.  
Regional Administrator

cc: F/PR2  
F/SER4

1514-22 f.l.

O:\SECTION7\INFORMAL\BROWCTY.JAX





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

MAR 1 2000

REPLY TO  
ATTENTION OF  
Planning Division  
Environmental Branch

FEB 28 2000

Mr. Charles A. Oravetz  
Chief, Protected Species Management Branch  
National Marine Fisheries Service  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

Dear Mr. Oravetz:

The Jacksonville District, U.S. Army Corps of Engineers (Corps), in a cooperative effort with Broward County, is proposing to renourish 17.35 miles of coastline in Broward County.

The project would involve placement of approximately 3.5 million cubic yards of material from Hillsboro Inlet to south County line along the beaches in southern Pompano, Lauderdale-By-The-Sea, northern and central Fort Lauderdale, John U. Lloyd Beach State Recreation Area, Dania Beach, Hollywood, and Hallandale Beach. In addition to the placement of sand on the beach, a series of T-head groins would be constructed along the northernmost  $\frac{1}{2}$  mile of John U. Lloyd State Recreation Area. Fill would be obtained from seven borrow areas located between hardbottom areas offshore of the central and northern portion of the County, in depths ranging from 30 feet to 70 feet, and located from  $\frac{3}{4}$  to  $1\frac{1}{2}$  miles offshore. The method of dredging would be a hopper dredge. Rocks contained in the borrow material would be segregated on the hopper dredge and deposited in two offshore rock disposal areas, which are located within permitted artificial reef disposal areas. The material to be dredged and placed on the beach contains an average of 3.3% silt and 2.9% rock.

Listed species which may occur in the vicinity of the proposed work and are under the jurisdiction of the National Marine Fisheries Service (NMFS) are: loggerhead sea turtle (*Caretta caretta*, T), green sea turtle (*Chelonia mydas*, E), leatherback sea turtle (*Dermochelys coriacea*, E), hawksbill sea turtle (*Eretmochelys imbricata*, E), finback whale (*Balaenoptera physalus*, E), humpback whale (*Megaptera novaeangliae*, E), right whale (*Eubalaena*

E #  
1574-2  
5710



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
9721 Executive Center Drive North  
St. Petersburg, FL 33702

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AUG 29 1997

F/SEO13:CCC:jbm

F/PR-512-10-15-97

MEMORANDUM FOR: F/PR - Hilda Diaz-Soltero

FROM: F/SE - Andrew J. Kemmerer

SUBJECT: Section 7 consultation with the Corps of Engineers South Atlantic Division on hopper dredging

The attached draft biological opinion is submitted for your consideration. The opinion states our belief that hopper dredging during the established dredging windows is not likely to jeopardize the continued existence of any listed species. This opinion is non-controversial and is similar to previous biological opinions issued for hopper dredging in the South Atlantic Division. Early coordination with Therese Conant has been conducted to facilitate review of this consultation. The COE, however, would appreciate receiving the biological opinion prior to the new fiscal year to facilitate contracting.

Please contact Colleen Coogan (813-570-5312) if you have any questions or require additional information or if there is anything she can do to assist in the review of this opinion.

Attachment

cc: F/PR3 - T. Conant



CURTIS RDW for 22/11/97  
Hopper dredging

Sept 25, 1997

Brigadier General R. L. VanAntwerp, USA  
Division Engineer  
South Atlantic Division, Corps of Engineers  
77 Forsyth St., S.W., Room 313  
Atlanta, Georgia 30355-6801

Dear General VanAntwerp:

Enclosed is the regional biological opinion concerning the use of hopper dredges in channels and borrow areas along the Southeast U.S. Atlantic coast. This biological opinion updates the regional opinion conducted in 1995, and replaces the interim biological opinion issued on April 9, 1997. The opinion recognizes the efforts of the Corps of Engineer's (COE) South Atlantic Division (SAD) to minimize sea turtle takes through application of new technology such as draghead deflectors, seasonal dredging windows, termination of projects in which high rates of turtle takes are observed, and elevated staff effort to identify and resolve site-specific problems. Despite these major efforts and continuing plans by the COE to improve the effectiveness of the rigid draghead deflector and to resolve dredging schedules to reduce the likelihood of sea turtle interactions, the National Marine Fisheries Service believes that further sea turtle takes are likely in future years. However, we believe that these takes are not likely to jeopardize the continued existence of any species. An annual incidental take by injury or mortality of 35 loggerheads seven Kemp's ridleys, seven green turtles, two hawksbills, and five shortnose sturgeon is listed in the incidental take statement appended to the enclosed opinion. This annual take level can be monitored over fiscal years to be consistent with project contracts.

I appreciate your continued commitment to reduce sea turtle takes associated with dredging in your Division. COE Division and District staff have facilitated the excellent working relationship that exists between our offices within the SAD. We look forward to continuing these cooperative efforts in sea turtle conservation.

Sincerely,

Hilda Diaz-Soltero  
Director  
Office of Protected Resources

Enclosure

Endangered Species Act - Section 7 Consultation

Biological Opinion

Agency: U.S. Army Corps of Engineers, South Atlantic Division

Activity: The continued hopper dredging of channels and borrow areas in the southeastern United States

Consultation Conducted By: National Marine Fisheries Service, Southeast Regional Office

Date Issued: 4/25/97

**Background**

Hopper dredging in channels and borrow areas along the southeastern coast of the United States during the spring of 1997 resulted in an unanticipated high rate of loggerhead take. The number of takes quickly approached the incidental take level established in the regional biological opinion (BO) issued to the Army Corps of Engineers (COE) on August 25, 1995. A formal consultation considering the take rates as well as the dredging locations and conditions was conducted and an interim biological opinion (IBO) was issued on April 9, 1997 and is incorporated by reference. The IBO concluded that continued hopper dredging during the 1997 fiscal year was likely to take additional sea turtles but was not likely to jeopardize the continued existence of any species. The incidental take, by injury or mortality, of seven (7) documented Kemp's ridleys, seven (7) green turtles, two (2) hawksbills, sixteen (16) loggerhead turtles, and five (5) shortnose sturgeon was set pursuant to the IBO. This modification added 15 loggerheads to the annual incidental take level, bringing the 1997 fiscal year total incidental take level to 35 loggerheads.

The history of Endangered Species Act (ESA) Section 7 consultations on the deployment of hopper dredges to maintain the depths of southeastern channels is discussed in the August 25, 1995 BO and is incorporated by reference. Although no endangered sea turtles have been taken in any channel dredging project to date during the 1997 fiscal year, 28 loggerheads have been taken, including nine loggerheads taken subsequent to the issuance of the IBO (Table 1).

During 1997, the COE responded to high rates of sea turtle takes by assessing each dredging project, modifying draghead deflectors when apparently necessary, conducting relative

abundance surveys and relocation trawling, and ultimately ending a number of projects prior to completion (Kings Bay, Brunswick Harbor, Savannah Harbor and Morehead City).

### **1991 Biological Opinion**

Two hundred twenty-five sea turtle takes, including 22 live turtles, were documented between 1980 and 1990 in the Southeast channels despite limited observer coverage in most channels throughout most of that decade (Table 2a.). Seventy-one of these turtles were taken in four months of dredging in the Canaveral ship channel in 1980, the first year in which observers were required. Twenty-one were observed in over two years of dredging in the Kings Bay Channel in 1987-1989, after observers were first deployed on dredges in that channel. Observers were required on most hopper dredges after 1989. Documented takes of turtles on dredges in Brunswick and other Southeast U.S. channels indicated that sea turtles were vulnerable to hopper dredges in all southeastern channels during warmer months. These observations resulted in the Section 7 consultation that concluded with a BO issued on November 25, 1991.

The November 1991 BO was the first cumulative area consultation between NMFS and COE's South Atlantic Division (SAD) regarding hopper dredging. The BO considered hopper dredging in channels from the Canaveral in Florida through Oregon Inlet, North Carolina. The 1991 BO concluded that continued unrestricted hopper dredging in Southeast U.S. channels could jeopardize the continued existence of listed sea turtles. The Opinion established a reasonable and prudent alternative to unrestricted hopper dredging which prohibited the use of a hopper dredge in the Canaveral ship channel, and from April 1 through November 30 in other southeastern channels north of Canaveral. An incidental take level was established based on assumptions that takes would be significantly reduced due to limited dredging windows, but that water temperatures in some years would result in turtle presence in channels during December and March. Observers were required on dredges equipped with outflow and/or inflow screening in March and December. The presence or absence of turtles in December would determine the further need for observer coverage into January. The documented incidental take of a total of five (5) Kemp's ridley, green, hawksbill or leatherback turtle mortalities in any combination of which no more than two (2) are Kemp's ridley, or fifty (50) loggerhead turtle mortalities was set. The Opinion anticipated that seasonal restrictions on hopper dredging would be adjusted on a channel-by-channel basis as better information on turtle occurrence was collected. Additionally, the development and testing of a draghead deflector was promoted.

### **1995 Biological Opinion**

Between 1992 and 1995, only 16 sea turtle takes were documented (Table 2b.), including three that were alive when collected during dredging operations in the SAD under the dredging windows established in the November 1991 BO. During that period, COE developed a rigid draghead deflector that appeared to be effective during videotaped dredging trials using mock turtles, as well as during experimental dredging associated with trawling in the Canaveral Channel. COE also completed a study of six Southeast channels to determine seasonal

abundance and spatial distribution of these turtles. A discussion of the findings can be found in the COE report entitled "Assessment of Sea Turtle Abundance in Six South Atlantic U.S. Channels" (Dickerson et al. 1994), summarized in the 1995 BO. Based on the new information, COE requested expanded dredging windows and observer requirements. NMFS considered their request and developed alternative dredging windows and observer requirements and added requirements for the use of hopper dredges in borrow areas along the East Coast.

After 1995, COE districts within the SAD generally required observers in some channels, such as Kings Bay, throughout the winter, beyond the new monitoring windows. SAD hopper dredge projects were initially conducted in the middle of the dredging windows, when nearshore waters were cool. During 1996, only nine sea turtle takes, including one green turtle and eight loggerheads, were documented (Table 2c.). No more than three takes occurred in any project. The new dredging windows and draghead deflector requirements appeared to provide good protection to sea turtles.

Hopper dredging operations contracted for the 1997 fiscal year were planned for early in the calendar year; however, a number of operations were not begun until late winter. Beginning on March 2, 1997, loggerhead takes occurred in Kings Bay at rates higher than previously observed. Six turtles were taken in four days of dredging. While consulting with NMFS regarding this unprecedented rate of loggerhead takes, a COE specialist from the Waterways Experiment Station proposed some modifications to the draghead that could reduce sea turtle takes. Relocation trawling was also initiated, beginning March 9, 1997; however, as can be seen on Table 2, these efforts did not preclude further sea turtle takes in Kings Bay. Dredging was terminated on March 12, 1997, with only 53 percent of the project completed.

Table 1 lists the sea turtle takes observed in hopper dredges throughout the SAD during 1997, as well as the steps taken by COE to reduce the likelihood of takes. Deflector dragheads were re-engineered to fit specific dredges wherever possible and relocation trawling was initiated. Dredging was terminated prior to completion of projects in Kings Bay, Brunswick Harbor, Savannah Harbor and Charleston Harbor. Consultation was reinitiated to consider the effects of the remaining hopper dredging projects anticipated for the 1997 fiscal year. In addition to those specific projects listed in the resulting April 1997 IBO, dredging at Reach II of the Myrtle Beach dredge disposal area is likely to begin before the fiscal year ends. Despite ongoing dredging at the Oregon Inlet, no sea turtle takes have been documented since May 15.

### Proposed Activity

This consultation addresses the use of hopper dredges in channels and borrow areas along the Atlantic portion of COE's SAD within the existing dredging windows (Table 3). Channels dredged by hopper dredges include: Oregon Inlet, Morehead and Wilmington harbors, Charleston, Port Royal and Savannah harbors, Brunswick, Kings Bay, Jacksonville, St. Augustine and Ponce de Leon inlets, West Palm Beach, Miami and Key west channels. Borrow

areas that may be dredged by hopper dredges include areas off of Dade County, Florida and Myrtle Beach, South Carolina.

Draghead deflectors will be used on all projects and observers will be required at least during those periods identified in Table 3. Year-round observer coverage will likely be required by the COE for most channels, particularly those with histories of high sea turtle catch rates such as Kings Bay. Within the South Atlantic Division, the COE will try to schedule dredging of the highest risk areas (Canaveral, Brunswick, Savannah, and Kings Bay) during periods when nearshore waters are coolest -- after December 15 but well before March. Priority for winter dredging will also be given to areas that have substrates that reduce the efficiency of the deflector (Wilmington Harbor channel, Reach 1 of Myrtle Beach). Completion of all projects during the cold-water months will be attempted when possible.

### Listed Species and Critical Habitat

Listed species under the jurisdiction of the NMFS that may occur in channels along the southeastern United States and which may be affected by dredging include:

#### THREATENED:

- (1) the threatened loggerhead turtle - Caretta caretta

#### ENDANGERED:

- (1) the endangered right whale - Eubalaena glacialis
- (2) the humpback whale - Megaptera novaeangliae
- (3) the endangered/threatened green turtle - Chelonia mydas
- (4) the endangered Kemp's ridley turtle - Lepidochelys kempii
- (5) the endangered hawksbill turtle - Eretmochelys imbricata
- (6) the endangered shortnose sturgeon - Acipenser brevirostrum

Green turtles in U.S. waters are listed as threatened, except for the Florida breeding population which is listed as endangered.

Additional endangered species which are known to occur along the Atlantic coast include the finback (Balaenoptera physalus), the sei (Balaenoptera borealis), and sperm (Physeter macrocephalus) whales and the leatherback sea turtle (Dermochelys coriacea). NMFS has determined that these species are unlikely to be adversely affected by hopper dredging activities.

Information on the biology and distribution of sea turtles can be found in the 1991 and 1995 BOs, which are incorporated by reference. Channel specific information has been collected by COE for channels at Morehead City, Charleston, Savannah, Brunswick, Fernandina and Canaveral, and is presented in detail in COE summary report entitled "Assessment of Sea Turtle Abundance in Six South Atlantic US Channels" (Dickerson *et al.*, 1994) and in the COE Biological Assessment.

There is no significant new information regarding the status of these species that has not been discussed in the BOs that have been incorporated by reference (March 12, 1997 and August 25, 1995).

### Assessment of Impacts

The BO issued in 1991 contained strict dredging windows that appeared to be very effective at limiting the number of sea turtles taken by hopper dredges during channel maintenance dredging in the Southeast U.S. along the Atlantic coast. Between 1991 and 1995, no more than eight turtles were taken in any year, and many of those taken were released alive. Studies conducted by the COE (Dickerson *et al.*, 1994) documented turtle distribution and abundance in six channels that suggesting the existing windows were accurate. However, the COE requested expansion of existing windows to lessen the burden of maintenance dredging while testing and further developing a rigid draghead deflector designed. The deflector was effective at pushing aside mock turtles when tested during 1994, and preliminary field trials in the Canaveral shipping channel had encouraging results. NMFS considered this new information, presented by the COE in a biological assessment forwarded to NMFS in November 1994. The resultant BO, issued August 25 1995, expanded dredging windows and modified observer requirements.

Only nine sea turtle takes were documented in 1996, suggesting that the expanded dredging windows and the deflector requirements provided protection to sea turtles that was similar to the previously more-restrictive windows. However, the COE's internal policy resulted in conduct of most of the hopper dredging projects during months when coastal waters were still cold, consistent with the previous dredging. The increased rate of take observed during 1997 and discussed below suggests that the restriction of hopper dredging to months when nearshore waters are cold remains the best method for minimizing sea turtle takes.

Unfortunately, a number of dredging projects contracted for early 1997 in the SAD, but not restricted to mid-winter months, were delayed into the spring. This delay coincided with a unseasonably warm winter, when the waters of Kings Bay reached 60°F in early March. The incidental take of nine loggerheads in Kings Bay over only 11 days of dredging indicated that the nearshore abundance of loggerheads was high, apparently higher than during the late 1980s when observers were first deployed on hopper dredges in Kings Bay.

There were other indicators of high nearshore sea turtle abundance along the Southeast U.S. Atlantic coast during 1997. Commercial shrimp trawling conducted without the use of turtle excluder devices (TEDs) offshore of South Carolina and Georgia between May 15 and July 15 resulted in sea turtle catch rates higher than previously documented. Sixty-nine sea turtles were taken in 29 days of shrimping off South Carolina, including 65 loggerheads, three ridleys and one leatherback. Forty-six sea turtles were taken in 17 days of towing off Georgia. The sea turtle catch per unit effort (CPUE) for this operation is about 0.35 turtles per hour of trawling, standardized to 100 feet (30.5 m) of total headrope length fished. The CPUE (same units) for commercial shrimp trawling in the 1970s and 1980s reported by Henwood and Stuntz (1987a)

was only 0.0487. Loggerhead turtles were the predominant species reported by Henwood and Stuntz and have also been predominantly observed in this study. They account for most of the increase in overall CPUE. The CPUE for loggerheads alone has been greater than 0.30 turtles per hour, while the value reported in Henwood and Stuntz was 0.0456 turtles per hour. The rates of taking for leatherback and Kemp's ridley turtles in the Atlantic study area have also been higher than anticipated.

The high relative density of sea turtles during 1997 may be due to an unseasonably warm winter or other factors contributing to annual variations in abundance, due to an actual increase in the abundance of benthic immature sea turtles in the loggerhead population, or due to a combination of these factors. Trends in the status of loggerheads are generally identified at the nesting beach, when the most accessible life stage, adult nesting females, can be counted. Because they mature at 20 to 30 years of age, increases or decreases in the abundance of benthic immature loggerheads as determined by incidental captures in nearshore waters would not be observed for decades. While nesting beach surveys suggest that the South Florida population of loggerheads increased and now appears to be stable, increases have not been apparent on nesting beaches of Georgia and South Carolina. Further work on the development of multi-year in-water sampling sites is needed to identify trends in multiple age-classes of the loggerhead population.

The COE noted that 14 of the 28 takes that occurred during 1997 were on the same dredge, the Eagle. The high rate of takes, particularly on this dredge, suggested that the deflecting draghead was not installed properly or was not being operated properly. Takes occurred in a number of the 1997 dredge projects during clean-up. Ridges left behind after the initial dredging are leveled during clean-up, but the draghead passes over troughs. Takes occurring during clean-up may be difficult to avoid since the draghead deflector must remain hard on the bottom to be effective.

The COE has been conducting meetings between districts within the SAD to discuss the results of assessments of channel conditions and dredge inspections. They have determined that the draghead deflector has not been working properly due to poor education of the dredge operators on its proper use and poor tailoring of the deflector to specific dragheads. Increased efforts to educate dredge operators are planned. Additionally, since fewer than 10 private hopper dredges operate within SAD, engineers that have designed the conceptual deflector will be sent to the dredges to insure that the deflectors are adapted to each draghead and that the operators understand how to use the deflector effectively.

### CUMULATIVE EFFECTS

"Cumulative effects" are those effects of future state or private activities, not involving Federal actions, that are reasonably certain to occur within the action area of the Federal action subject to consultation. These are discussed in detail in the biological opinions incorporated by reference.

### Conclusion:

NMFS believes that the elevated rate of observed sea turtle takes by dredges in the southeastern United States during March of 1997 was likely due to increased abundance of loggerheads in nearshore waters due to an unseasonably warm winter. There is no way to predict whether similar conditions will be encountered in upcoming seasons. Over the past six years, the COE's SAD has continuously expressed a commitment to minimize sea turtle takes, and has conducted research and taken repeated steps to further this goal. Repeated termination of dredging operations due to high sea turtle takes during 1997 confirms their commitment to avoid sea turtle takes. Further efforts to educate the dredging industry and recruit their interest and involvement in avoiding sea turtle takes are necessary and are planned by the COE. Additionally, the COE has committed to additional efforts to improve the effectiveness of the deflecting draghead. The sea turtle deflector should be tailored to each hopper dredge draghead and the dredge operators should be fully trained in the operation of the draghead to ensure proper use and improve effectiveness. Improvements in operator and deflector performance are necessary prior to reliance on the draghead as a mechanism for reducing sea turtle takes.

NMFS anticipates that the COE's interest in improving the performance of the deflector, their commitment to limit the use of hopper dredges in channels of high sea turtle abundance during periods when nearshore waters are likely to be cold, and their overall goal of further reducing sea turtle takes during hopper dredge activities will minimize the interactions of hopper dredges with sea turtles. However, annual variation in the abundance of sea turtles in some channels and borrow areas make it likely that sea turtle takes will still occur. Additionally, overall increases in loggerhead and Kemp's ridley populations are anticipated due to TED requirements that have reduced the mortality rates of benthic lifestages of these species. Lastly, in some years high levels of hopper dredging activity may be necessary. For example, termination of projects prior to completion during FY 1997 may result in an increase in the number and length of hopper dredging projects necessary for channel maintenance during FY 1998. Therefore, NMFS believes that up to 35 loggerheads may be taken by injury or mortality, as well as seven Kemp's ridleys, seven green turtles, two hawksbills, and five shortnose sturgeon. These takes are not likely to jeopardize the continued existence of these species and the ongoing commitment by the COE to further minimize takes may reduce the likelihood of sea turtle takes in the future even if nearshore sea turtle abundances increase.

### **Conservation Recommendations**

Pursuant to section 7(a)(1) of the ESA, conservation recommendations are made to assist COE in reducing or eliminating adverse impacts to loggerhead, green, and Kemp's ridley turtles that result from hopper dredging in the southeastern United States. The recommendations made in the 1995 BO are pertinent to this consultation as well, and therefore remain valid. Further recommendations are given below.

- Because of the possibility of annual variation in water temperatures, sea turtle abundance, and hopper dredging demand, NMFS has retained the dredging windows established in the 1995 BO. However, the COE has expressed a commitment to deploy hopper dredges during

cold-water periods in channels with high sea turtle abundance or with substrates that render the deflector ineffective. NMFS appreciates the COE's commitment to do this, and recommends that the SAD priority list be finalized and distributed to the Districts and NMFS prior to the initiation of dredging during FY 1998.

- The COE should develop an educational/training program for dredge operators to increase their understanding of how the draghead deflector works and why it is necessary.
- The COE should work with the dredging industry to ensure their understanding of the importance of sea turtle conservation and to increase the industry's interest in minimizing sea turtle takes.
- Greater than 50 percent of the loggerheads that may be taken in North Carolina may be from the northern nesting assemblage of loggerheads. While recent loggerhead nesting beach surveys did not identify a decline in the number of nesting females on beaches north of Cape Canaveral, increases observed in the South Florida nesting assemblage have not been noted. High sea turtle catch rates during only the early weeks of the wood debris clean-up conducted by COE off Cape Fear during 1997, as well as preliminary work conducted in North Carolina, suggest that turtles may be abundant in North Carolina channels primarily during migration into and emigration out of North Carolina inshore waters. The COE should consider working with the NMFS Beaufort Laboratory and the North Carolina Division of Marine Fisheries to document the movements of sea turtles off North Carolina during spring and fall months. Results from these studies may provide insights into further safe dredging windows to minimize the likelihood of takes of loggerheads from the more vulnerable northern nesting assemblage. Summer windows would reduce the pressure to complete all SAD hopper dredging during cold-water periods.
- The COE should investigate further modifications of the draghead to minimize the need for clean-up. Some method to level the peaks and valleys created by dredging would reduce the amount of time dragheads are removed from the bottom sediments.

## Incidental Take Statement

Section 7(b)(4) of the Endangered Species Act (ESA) requires that when a proposed agency action is found to be consistent with section 7(a)(2) of the ESA, and the proposed action may incidentally take individuals of listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. It also states that reasonable and prudent measures, and terms and conditions to implement the measures, be provided that are necessary to minimize such impacts. Only incidental taking resulting from the agency action, including incidental takings caused by activities approved by the agency, that are identified in this statement and that comply with the specified reasonable and prudent alternatives, and terms and conditions, are exempt from the takings prohibition of section 9(a), pursuant to section 7 of the ESA.

Based on the high rate of sea turtle takes observed during of 1997, increases in the Kemp's ridley population, possible increases in the benthic lifestages of loggerhead populations, annual variation in nearshore abundance of sea turtles and hopper dredge demands, the NMFS anticipates that hopper dredging in the Southeast U.S. Atlantic area of the SAD may result in the injury or mortality of sea turtles and shortnose sturgeon. Therefore, a low level of incidental take, and terms and conditions necessary to minimize and monitor takes, are established. The annual (by fiscal year) documented incidental take, by injury or mortality, of seven (7) Kemp's ridleys, seven (7) green turtles, two (2) hawksbills, thirty-five (35) loggerhead turtles, and five (5) shortnose sturgeon is set pursuant to section 7(b)(4) of the ESA.

To ensure that the specified levels of take are not exceeded early in any project, COE should reinitiate consultation for any project in which more than one turtle is taken within 24 hours, or once five or more turtles are taken. The Southeast Region, NMFS, will cooperate with COE in the review of such incidents to determine the need for developing further mitigation measures or to terminate the remaining dredging activity.

Section 7(b)(4)(c) of the ESA specifies that in order to provide an incidental take statement for an endangered or threatened species of marine mammal, the taking must be authorized under section 101(a)(5) of the Marine Mammal Protection Act of 1972 (MMPA). Since no incidental take in the Atlantic Region has been authorized under section 101(a)(5) of the MMPA, no statement on incidental take of endangered right whales is provided.

The reasonable and prudent measures that the NMFS believes are necessary to minimize the impact of hopper dredging in channels and borrow areas in the southeastern United States have been discussed with COE. The following terms and conditions are established, in addition to those identified in the 1995 BO, to implement these measures and to document the incidental take should such take occur.

1. A COE engineer familiar with the draghead deflector design should inspect the rigid draghead deflector annually to ensure that the deflector has been tailored appropriately to each draghead.

Additionally, the inspector should assess whether the dredge operator appears to be familiar with the operation of the draghead deflector.

2. If the rigid draghead deflector appears to be ineffective in Wilmington Harbor and slows the dredging project such that the amount of time the hopper dredge will be deployed is increased, the deflector should be removed from the draghead for that channel.

ATLANTIC COAST HOPPER  
LOGGING (Calendar Year 97)

Project	Dredge Period	Approximate Amount of Work Completed	Turtle Takes	Mitigative Measures Taken	Remarks
Kings Bay	3/1/97 to 3/12/97	Removed 437,000 out of 821,000 CY Approximately 53% completed.	L 3/2/97 L 3/4/97 L 3/5/97 L 3/6/97 L 3/6/97 L 3/6/97 L 3/8/97 L 3/8/97 L 3/12/97	Sea turtle deflecting draghead used. Jacksonville Dist. specialist inspected deflector on 3/6/97. Relocation trawling started 3/9/97. Extensive, ongoing consultation with NMFS as takes occurred. All work terminated 3/12/97 due to high take levels even though relocation trawling had become operational.	Water temp. 57 to 58 F. Dredge Eagle 1. Two takes in batch on 3/6/97 and 3/8/97. Contract required removal of relatively small veneer of material. Most takes occur through starboard dragarm. Rapidity of takes was surprise to all concerned.
Brunswick Harbor	2/6/97 to 3/19/97	Removed 975,400 CY. Work stopped at 50% completion.	L 3/9/97	Sea turtle deflecting draghead used. Sea turtle abundance, based on visual observations, prompted termination of work because of potential for unacceptable levels of entrainment.	Water temp 63.F. Dredge RN Weeks. Historic abundance of sea turtles and high levels of entrainment in 1991 was of the reason for termination of work.
Savannah Harbor	3/4/97 to 3/22/97	Removed about 645,500 CY, or about 52% of what could have been dredged.	L 3/14/97 L 3/22/97 L 3/22/97	Sea turtle deflecting draghead used. Dredging terminated so as not to take any more sea turtles.	Water temp. 63 F. Numerous sea turtles sighted. Dr. Ouachita was 'skimming' high areas to bring depth acceptable levels quickly before leaving for urgent work Mississippi River.
Charleston Harbor	3/14/97 to 3/26/97	Bid qty 900,000 CY Req. qty 408,000 CY Removed qty 350,000 CY. About 39% completed.	L 3/19/97 L 3/20/97 L 3/21/97 L 3/25/97 L 3/26/97	WES expert / developer of sea turtle deflecting draghead system, conducted onboard inspection and made recommendations. Some changes to draghead and dredging operation made. Relocation trawling performed.	Water temp. 61 F. Dredge Eagle 1.
Myrtle Beach borrow area (Phase 1)	9/15/96 to 5/13/97	Bid qty 2.5 million CY. Work completed.	L 4/15/97 L 5/04/97 L 5/09/97	Sea turtle deflecting draghead used. Relative abundance trawling on 3/28-29/97, with 12 hours of "nets in water", yielded one loggerhead. Trawling on 5/8 thru 5/13/97 yielded no sea turtles.	This is one of 3 phases / reaches of total project. Ps work in all phases is by pipeline dredge. Total quant material to be dredged is about 6 million CY
Morhead City Harbor	4/25/97 to 5/16/97	About 120,000 CY removed out of about 1,720,000 CY. About 7% of work completed.	L 4/27/97 L 4/30/97 L 5/01/97 L 5/02/97 L 5/15/97 L 5/15/97	Sea turtle deflecting draghead. Relocation trawling began 5/8/97 and continued until termination of dredging. One loggerhead captured on 5/9/97. Nighttime trawling performed 5/10 & 5/11 with no turtles captured. Because of concern over extensive takes, dredging terminated with only 7% of work done.	Dredge Manhattan Island
Wilmington Harbor (Interior Channels)	2/14/97 to 3/13/97	About 217,300 CY removed. Work completed.	No takes		Dredge McFarland
MOTSU	3/14/97 to 4/3/97	About 60,000 CY. removed. Work completed.	No takes		Dredge McFarland
Wilmington Harbor (Ocean Bar)	4/3/97 to 4/30/97	About 300,000 CY Work completed.	L 4/07/97	Sea turtle deflecting draghead.	Dredge RN Weeks
Dade County Beach (Miami Reach)	3/30/97 to 7/20/97 (estimate)	About 380,000 of 475,000 CY completed as of 6/6/97.	No takes	Based on past dredging and anecdotal information about sea turtles in area, takes are not anticipated.	

L = Loggerhead      CY = Cubic Yards

Table 2a. Sea turtle takes (includes live, injured and killed) observed on hopper dredge prior to the regional consultation. Observers were not required on all projects until 1989, after which extensive monitoring was required.

Year	Project	Turtle Takes
1980 Total = 71	Canaveral	50 Cc, 3 Cm, 18 Unidentified
1981 Total = 6	Canaveral	3 Cc, 1 Cm, 2 Unidentified
1984/1985 Total = 12	Canaveral	1 Cc, 11 Unidentified
1986 Total = 9	Canaveral	5 Cc
	Kings Bay	1 Cc, 3 Cm
1987 Total = 5	Kings Bay	3 Cc, 1 Cm, 1 Unidentified
1988 Total = 46	Brunswick	1 Cc
	Canaveral	13 Cc, 3 Cm, 18 Unidentified
	Kings Bay	6 Cc, 3 Lk, 2 Cm
1989 Total = 21	Canaveral	9 Cm, 2 Unidentified
	Kings Bay	8 Cc, 1 Cm
	Savannah	1 Cc
1990 Total = 12	Canaveral	3 Cc, 5 Cm
	Kings Bay	4 Cc
1991 Total = 43	Brunswick	20 Cc, 1 Lk, 1 Unidentified
	Charleston	3 Cc
	Kings Bay	1 Cc
	Savannah	17 Cc

Cc = *Caretta caretta*, Loggerhead; Cm = *Chelonia mydas*, Green turtle; Lk = *Lepidochelys kempi*, Kemp's ridley turtle

TABLE 3: Current requirements for dredging windows, observer requirements and use of hopper dredges in boi areas along the east coast established in the August 1995 BO.

AREA	WHALE MONITORING	SEA TURTLE MONITORING: NAVIGATION CHANNELS		SEA TURTLE MONITORING: BORROW AREAS	
		PIPER/WINDOWS	MONITORING	WINDOWS	MONITORING
North Carolina to Pawleys Island, SC (includes channels at Oregon Inlet, Morehead City and Wilmington)	One observer (daytime coverage) between 1 Dec and 31 Mar. Monitoring by dredge operator and sea turtle observer between 1 Apr and 30 Nov.	Year Round	Two observers (100% monitoring) 1 Apr - 30 Nov	Year Round	One observer (50% monitoring) 1 Apr - 30 Nov
Pawleys Island, SC to Tybee Island, GA (includes channels at Charleston, Port Royal and Savannah)	One observer (daytime coverage) between 1 Dec and 31 Mar. Monitoring by dredge operator and sea turtle observer between 1 Apr and 30 Nov.	1 Nov - 31 May	Two observers (100% monitoring) 1 Nov - 30 Nov and 1 Apr - 31 May	Year Round	One observer (50% monitoring) 1 Apr - 30 Nov
Tybee Island, GA to Titusville, FL (includes channels at Brunswick, Kings Bay, Jacksonville, St. Augustine, and Ponce de Leon Inlet)	Aerial surveys in night whale critical habitat, 1 Dec thru 31 Mar. One observer (daytime coverage) between 1 Dec and 31 Mar.	1 Dec - 15 Apr	Two observers (100% monitoring) 1 Apr - 15 Apr	Year Round	One observer (50% monitoring) 1 Apr - 15 Dec
Titusville, FL to Key West, FL (includes channels at West Palm Beach, Miami and Key West)	Whale observations are not necessary beyond those conducted between monitoring of dredge spoil.	Year Round	Two observers (100% monitoring) year round ✓	Year Round	One observer (50% monitoring) year round



FLORIDA DEPARTMENT OF STATE  
**Jim Smith**  
Secretary of State  
DIVISION OF HISTORICAL RESOURCES

Mr. James C. Duck  
Jacksonville District US Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

October 23, 2002

Re: DHR No. 2002-09147 / Date Received by DHR: October 7, 2002  
*Historic Assessment and Remote Sensing Survey at Port Everglades, Broward County, Florida*  
(Mid-Atlantic Technology and Environmental Research, Inc. 2002) - Final Report

Dear Mr. Duck:

Our office has received and reviewed the above referenced project in accordance with Section 106 of the *National Historic Preservation Act of 1966* (Public Law 89-665), as amended in 1992, and *36 C.F.R., Part 800: Protection of Historic Properties*. The State Historic Preservation Officer is to advise and assist federal agencies when identifying historic properties listed or eligible for listing in the *National Register of Historic Places*, assessing effects upon them, and considering alternatives to avoid or minimize adverse effects.

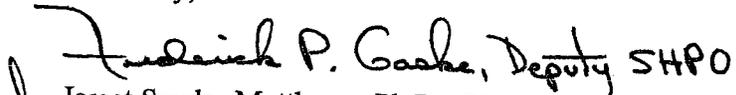
The draft version of the referenced report was reviewed by this office on April 25, 2002 (DHR No. 2002-03860). Results of the survey indicated that four targets not associated with visible debris or structures (PortE-1 – PortE-4) were identified. None of these targets produced signatures characteristic of submerged cultural resources. We maintain our concurrence with the determination of Mid-Atlantic Technology and Environmental Research, Inc. that the proposed project will have no effect on any historic properties listed, or eligible for listing, in the *National Register of Historic Places*. However, please note that at the time of our initial review, this office did not consider the draft report sufficient in accordance with Chapter 1A-46, *Florida Administrative Code*, due to the absence of the following information:

- Pertinent environmental and paleoenvironmental data
- Procedures to deal with unexpected discoveries

This information is also absent from the final report. In the future, this office will not concur with the findings of draft reports that are not complete and sufficient. The complete language of Chapter 1A-46 is available online at <http://dhr.dos.state.fl.us/bhp/compliance>.

If you have any questions concerning our comments, please contact Mary Beth Fitts, Historic Sites Specialist, at [mbfitts@mail.dos.state.fl.us](mailto:mbfitts@mail.dos.state.fl.us) or (850) 245-6333. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

  
Janet Snyder Matthews, Ph.D., Director, and  
State Historic Preservation Officer

Xc: Mr. Wes Hall, Mid-Atlantic Technology and Environmental Research, Inc.

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St. Augustine Regional Office  
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Tampa Regional Office  
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**APPENDIX D – DRILLING LOGS – SEDIMENT CORE BORINGS  
COLLECTED FROM ENTRANCE CHANNEL SHOAL**

Boring Designation CB-PEH03-1

<b>DRILLING LOG</b>		DIVISION South Atlantic		INSTALLATION Jacksonville District		SHEET 1 OF 3 SHEETS	
1. PROJECT Port Everglades Harbor, FL Entrance Channel				9. SIZE AND TYPE OF BIT See Remarks			
2. BORING DESIGNATION CB-PEH03-1		LOCATION COORDINATES X = 950,018 Y = 640,997		10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)		HORIZONTAL NAD83	
3. DRILLING AGENCY Corps Of Engineers		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500		<input type="checkbox"/> AUTO HAMMER <input checked="" type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Danny Hewett				12. TOTAL SAMPLES		DISTURBED 29	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED				13. TOTAL NUMBER CORE BOXES		UNDISTURBED (UD) 0	
6. THICKNESS OF OVERBURDEN		0.0 Ft.		14. ELEVATION GROUND WATER		N/A	
7. DEPTH DRILLED INTO ROCK		0.0 Ft.		15. DATE BORING		STARTED 06-18-03 COMPLETED 06-19-03	
8. TOTAL DEPTH OF BORING 43.0 Ft.				16. ELEVATION TOP OF BORING		-12.9 Ft.	
				17. TOTAL RECOVERY FOR BORING		67 %	
				18. SIGNATURE AND TITLE OF INSPECTOR Michael Ruth, Geologist			

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	ROD OR URD	REMARKS	BLOWS/0.5 FT.	N-VALUE
-12.9	0.0								
			SAND, poorly-graded, mostly fine to coarse-grained sand-sized carbonate, little shell up to 1/4", strong reaction with HCl, homogeneous, green/gray (SP)	33	1		-12.9	10	
			At El. -14.4 Ft., mostly fine-grained sand-sized carbonate	47	2		-14.4	11	23
			At El. -15.9 Ft., few shell	47	3		-15.9	12	24
				100	4		-17.4	4	31
				100	5		-18.9	7	5
				27	6		-20.4	24	23
				0	7		-21.9	5	29
				100	8		-23.4	9	28
				0	9		-24.9	12	13
				80	10		-26.4	6	10
			At El. -26.4 Ft., some shell up to 1/4"				-27.9	7	7
								3	20
								8	15

Boring Designation CB-PEH03-1

DRILLING LOG (Cont. Sheet)		INSTALLATION			SHEET 2				
		Jacksonville District			OF 3 SHEETS				
PROJECT		COORDINATE SYSTEM/DATUM		HORIZONTAL	VERTICAL				
Port Everglades Harbor, FL		State Plane, FLE (U.S. Ft.)		NAD83	MLLW				
LOCATION COORDINATES		ELEVATION TOP OF BORING							
X = 950,018 Y = 640,997		-12.9 Ft.							
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OF SAMPLE	ROD OR UD	REMARKS	BLOWS/0.5 FT.	N-VALUE
-29.4	16.5	[Dotted pattern]	SAND, poorly-graded, mostly shell (SP)	100	11		SPT Sampler	7 10	29
-30.9	18.0	[Dotted pattern]	SAND, poorly-graded, mostly fine-grained sand-sized carbonate, some shell (SP)	33	12		SPT Sampler	17 17	36
-32.4	19.5	[Dotted pattern]	SAND, poorly-graded, mostly shell up to 1/4" (SP)	67	13		SPT Sampler	8 9	23
-35.4	22.5	[Dotted pattern]	SAND, poorly-graded, mostly fine-grained sand-sized carbonate, some shell (SP)	60	14		SPT Sampler	9 9	20
		[Dotted pattern]	At El. -33.9 Ft., mostly shell up to 1/8"	87	15		SPT Sampler	12 14	24
		[Dotted pattern]	SAND, poorly-graded, mostly fine-grained sand-sized carbonate, some shell (SP)	80	16		SPT Sampler	10 20	30
		[Dotted pattern]	At El. -41.4 Ft., trace wood debris	93	17		SPT Sampler	24 30	70
		[Dotted pattern]	At El. -42.9 Ft., dark gray/green	7	18		SPT Sampler	8 14	32
		[Dotted pattern]	At El. -45.9 Ft., few fine-grained sand-sized carbonate	100	19		SPT Sampler	10 9	19
		[Dotted pattern]	WOOD, some fine to coarse-grained sand-sized shell up to 1/4"	100	20		SPT Sampler	8 9	23
		[Dotted pattern]	At El. -45.9 Ft., few fine-grained sand-sized carbonate	100	21		SPT Sampler	7 10	24
-45.6	32.8	[Dotted pattern]	WOOD, some fine to coarse-grained sand-sized shell up to 1/4"	100	22		SPT Sampler	11 9	20
-47.4	34.5	[Dotted pattern]	SAND, poorly-graded, mostly shell, some	100	23		SPT Sampler	5 9	23
		[Dotted pattern]	SAND, poorly-graded, mostly shell, some	53	24		SPT Sampler	6	35

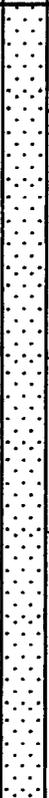
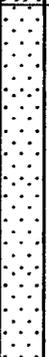
DRILLING LOG (Cont. Sheet)		INSTALLATION		SHEET 3																																
PROJECT Port Everglades Harbor, FL		Jacksonville District		OF 3 SHEETS																																
LOCATION COORDINATES X = 950,018 Y = 640,997		COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW																															
		ELEVATION TOP OF BORING -12.9 Ft.																																		
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	ROD OR UD	REMARKS	BLOWS/0.5 FT.	N-VALUE																											
-48.9	36.0	[Dotted pattern]	fine-grained sand-sized carbonate, trace wood debris, dark gray/green (SP)	53	24		SPT Sampler	8	14																											
			SAND, poorly-graded, mostly fine-grained sand-sized carbonate, some shell (SP)	27	25		SPT Sampler	6	15																											
								6																												
								9																												
					100	26		SPT Sampler	14	30																										
								16																												
								14																												
				67	27		SPT Sampler	8	20																											
							12																													
							8																													
				67	28		SPT Sampler	10	26																											
							16																													
							8																													
-55.8	43.8		LIMESTONE, hard, slightly weathered, fine-grained, dark gray	70	29		SPT Sampler	19	69+																											
			NOTES: 1. Soils are field visually classified in accordance with the Unified Soils Classification System. 2. Laboratory Testing Results				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).	50/0.0'	45																											
			<table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr><td>1</td><td>0.0/1.5</td><td>SP-SM*</td></tr> <tr><td>2</td><td>1.5/3.0</td><td>SP*</td></tr> <tr><td>5</td><td>6.0/7.5</td><td>SP*</td></tr> <tr><td>8</td><td>10.5/12.0</td><td>SP*</td></tr> <tr><td>11</td><td>15.0/16.5</td><td>SP*</td></tr> <tr><td>15</td><td>21.0/22.5</td><td>SP*</td></tr> <tr><td>20</td><td>28.5/30.0</td><td>SP-SM*</td></tr> <tr><td>23</td><td>33.0/34.5</td><td>SP-SM*</td></tr> </tbody> </table>	SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	0.0/1.5	SP-SM*	2	1.5/3.0	SP*	5	6.0/7.5	SP*	8	10.5/12.0	SP*	11	15.0/16.5	SP*	15	21.0/22.5	SP*	20	28.5/30.0	SP-SM*	23	33.0/34.5	SP-SM*						
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION																																		
1	0.0/1.5	SP-SM*																																		
2	1.5/3.0	SP*																																		
5	6.0/7.5	SP*																																		
8	10.5/12.0	SP*																																		
11	15.0/16.5	SP*																																		
15	21.0/22.5	SP*																																		
20	28.5/30.0	SP-SM*																																		
23	33.0/34.5	SP-SM*																																		
			*Lab visual classification based on gradation curve. No Atterberg limits.						50																											

Boring Designation CB-PEH03-2

<b>DRILLING LOG</b>		DIVISION South Atlantic		INSTALLATION Jacksonville District			SHEET 1 OF 3 SHEETS	
1. PROJECT Port Everglades Harbor, FL Entrance Channel				9. SIZE AND TYPE OF BIT See Remarks				
2. BORING DESIGNATION CB-PEH03-2		LOCATION COORDINATES X = 950,222 Y = 641,015		10. COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW	
3. DRILLING AGENCY Corps Of Engineers		CONTRACTOR FILE NO.		11. MANUFACTURER'S DESIGNATION OF DRILL Failing 1500		<input type="checkbox"/> AUTO HAMMER	<input checked="" type="checkbox"/> MANUAL HAMMER	
4. NAME OF DRILLER Danny Hewett				12. TOTAL SAMPLES		DISTURBED 26	UNDISTURBED (UD) 0	
5. DIRECTION OF BORING <input checked="" type="checkbox"/> VERTICAL <input type="checkbox"/> INCLINED		DEG. FROM VERTICAL	BEARING	13. TOTAL NUMBER CORE BOXES 1				
6. THICKNESS OF OVERBURDEN 0.0 Ft.				14. ELEVATION GROUND WATER N/A				
7. DEPTH DRILLED INTO ROCK 0.0 Ft.				15. DATE BORING		STARTED 06-20-03	COMPLETED 06-20-03	
8. TOTAL DEPTH OF BORING 39.0 Ft.				16. ELEVATION TOP OF BORING -16.4 Ft.				
				17. TOTAL RECOVERY FOR BORING 83 %				
				18. SIGNATURE AND TITLE OF INSPECTOR Michael Ruth, Geologist				

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	ROD OR UD	REMARKS	BLOWS / FT.	N-VALUE
-16.4	0.0		SAND, poorly-graded, mostly fine-grained sand-sized carbonate, some shell up to 1/8", strong reaction with HCl, green/gray (SP)				-16.4		
				67	1		SPT Sampler	1	4
				87	2		SPT Sampler	3	22
				100	3		SPT Sampler	7	19
				100	4		SPT Sampler	10	5
				87	5		SPT Sampler	10	13
				47	6		SPT Sampler	9	11
				100	7		SPT Sampler	8	14
				87	8		SPT Sampler	6	9
				87	9		SPT Sampler	5	10
				100	10		SPT Sampler	4	17
							-26.9	8	
							-28.4	8	
							-29.9	5	
							-31.4	4	

Boring Designation CB-PEH03-2

DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District		SHEET 2 OF 3 SHEETS						
PROJECT Port Everglades Harbor, FL			COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW					
LOCATION COORDINATES X = 950,222 Y = 641,015			ELEVATION TOP OF BORING -16.4 Ft.								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	ROD OR UD	REMARKS	BLOWS/10 FT.	N-VALUE		
			At El. -32.9 Ft., mostly fine to coarse-grained sand-sized carbonate  At El. -36.4 Ft., mostly fine-grained sand-sized carbonate  At El. -38.9 Ft., dark green	87	11		SPT Sampler	9 7 11	18		
				87	12		SPT Sampler	9 6 9	15		
				73	13		SPT Sampler	7 5 5	10		
				100	14		SPT Sampler	4 4 5	9		
				100	15		SPT Sampler	9 7 7	14		
				100	16		SPT Sampler	7 16 16	32		
				80	17		SPT Sampler	12 12 8	20		
				80	18		SPT Sampler	8 14 15	29		
				80	19		SPT Sampler	14 15 8	23		
				80	20		SPT Sampler	8 7 19	26		
				47	21		SPT Sampler	11 15 18	33		
				67	22		SPT Sampler	8 7 4	11		
-42.9	26.5					80	18		SPT Sampler	2 1 5	6
					SHELL, mostly shell, little sand	80	19		SPT Sampler	5 4 5	6
						80	20		SPT Sampler	5 4 5	6
					SAND, poorly-graded, mostly fine to medium-grained sand-sized carbonate, little shell, strong reaction with HCl, dark gray/green (SP)	80	20		SPT Sampler	8 7 19	26
						47	21		SPT Sampler	11 15 18	33
						67	22		SPT Sampler	8 7 4	11
-49.9	33.5			100	23		SPT Sampler	2 1 5	6		
			CLAY, fat, medium plasticity, little silt, dark olive green (CH)	100	23		SPT Sampler	1 5 4	6		
				80	24		SPT Sampler	5 4 4	6		
			LIMESTONE, moderately hard, highly weathered, coarse-grained, yellow/white/gray	80	24		SPT Sampler	5 4 4	6		
				80	24		SPT Sampler	5 4 4	6		

Boring Designation CB-PEH03-2

<b>DRILLING LOG (Cont. Sheet)</b>		INSTALLATION Jacksonville District		SHEET 3 OF 3 SHEETS
PROJECT Port Everglades Harbor, FL		COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)	HORIZONTAL NAD83	VERTICAL MLLW
LOCATION COORDINATES X = 950,222 Y = 641,015		ELEVATION TOP OF BORING -16.4 Ft.		

ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	ROD OR UD	REMARKS	BLOWS/ 0.5 FT.	N-VALUE
-55.4	39.0	Highly Weathered		80	24		SPT Sampler	14	28
							-52.4	14	
				80	25		SPT Sampler	18	24
							-53.9	12	
								12	
				67	26		SPT Sampler	10	25
							-55.4	15	
								10	

**NOTES:**

- Soils are field visually classified in accordance with the Unified Soils Classification System.
- Laboratory Testing Results

SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION
1	0.0/1.5	SP*
5	6.0/7.5	SP*
9	12.0/13.5	SP*
12	16.5/18.0	SP*
16	22.5/24.0	SP-SM*
18	25.5/27.0	SP-SM*
21	30.0/31.5	SP*
23	33.0/34.5	SM*

\*Lab visual classification based on gradation curve. No Atterberg limits.

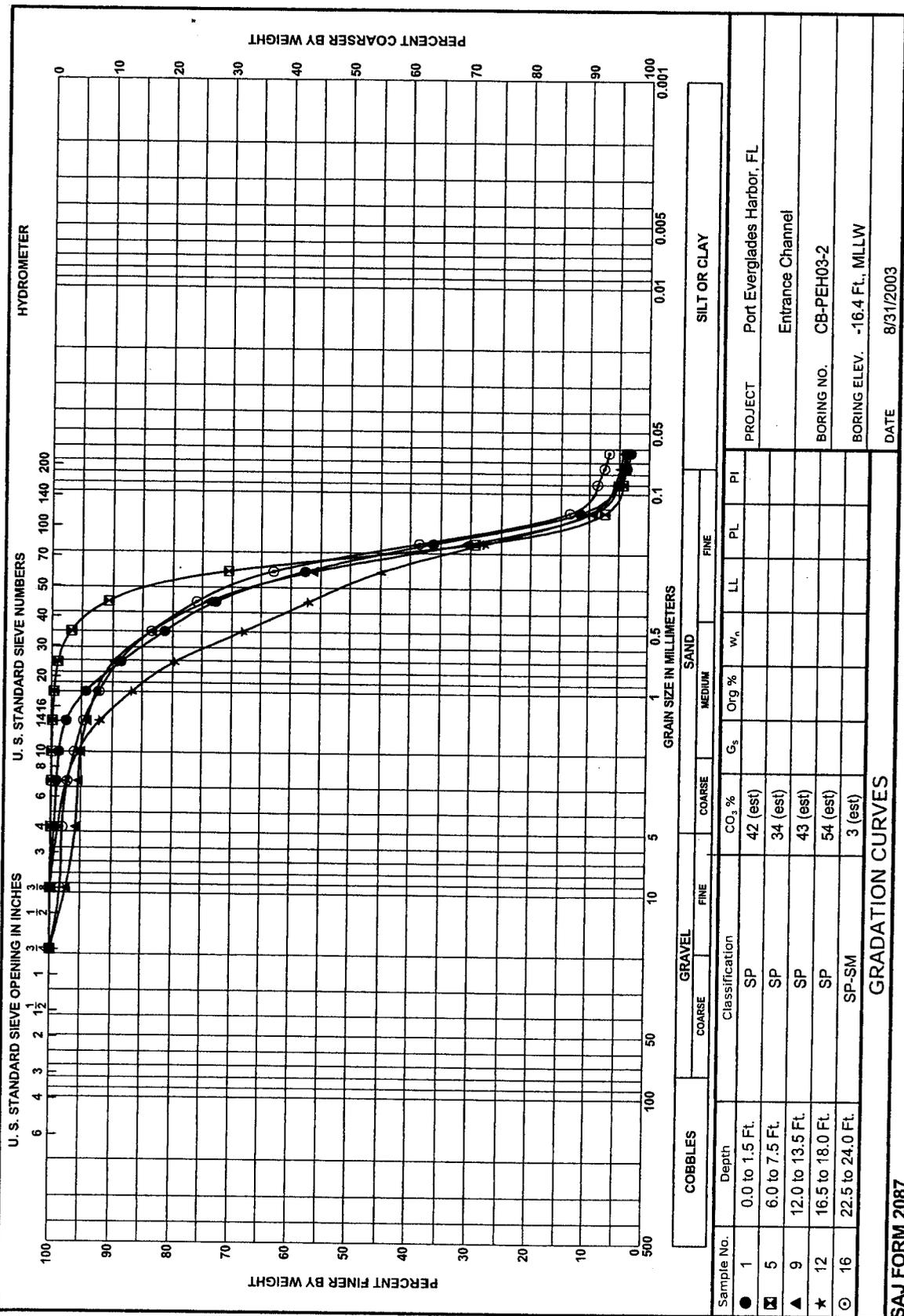
140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).

Abbreviations:  
WOH = Weight of Hammer.



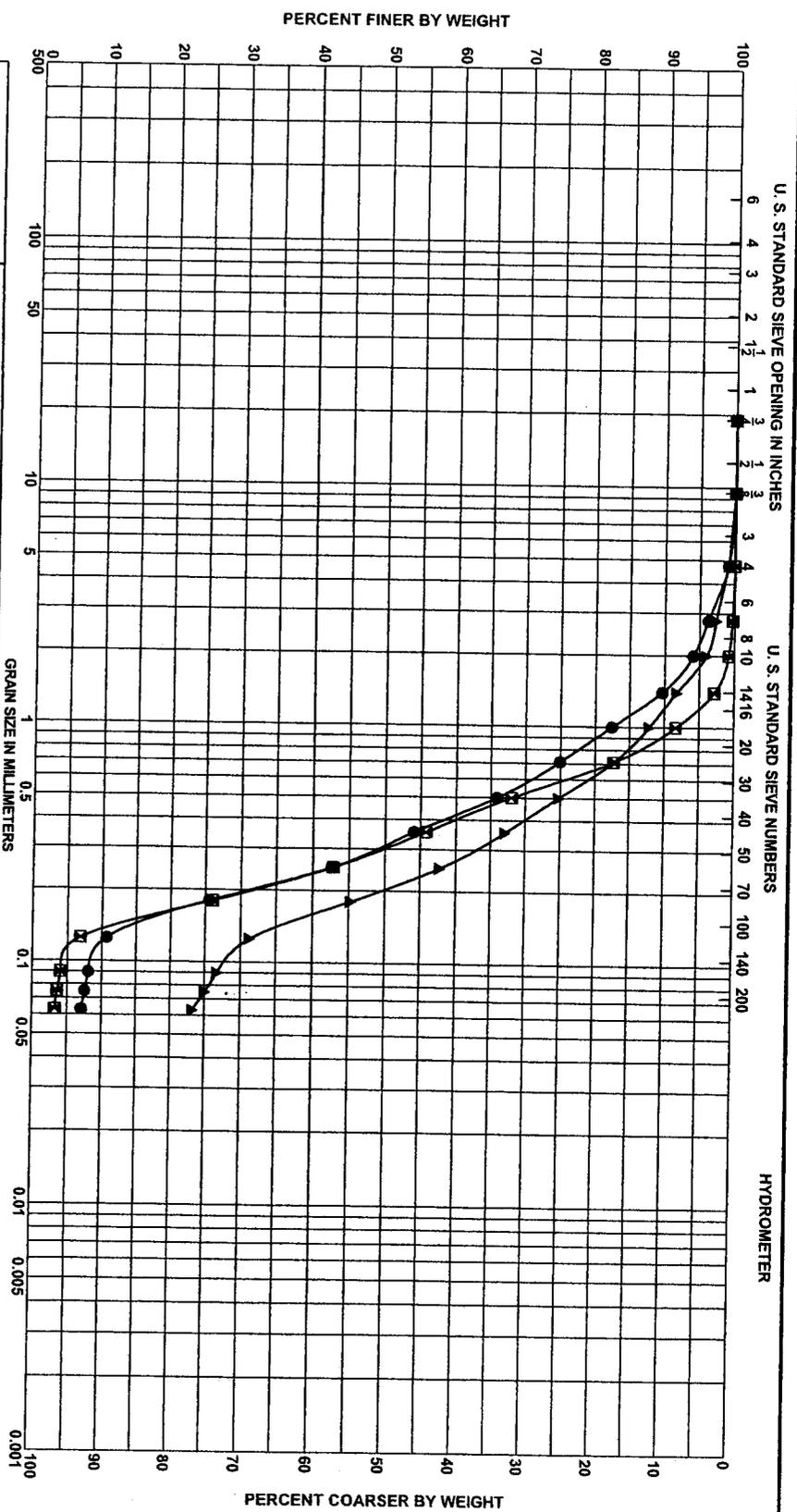
DRILLING LOG (Cont. Sheet)			INSTALLATION Jacksonville District			SHEET 2 OF 2 SHEETS																					
PROJECT Port Everglades Harbor, FL			COORDINATE SYSTEM/DATUM State Plane, FLE (U.S. Ft.)		HORIZONTAL NAD83	VERTICAL MLLW																					
LOCATION COORDINATES X = 949,854 Y = 641,018			ELEVATION TOP OF BORING -16.7 Ft.																								
ELEV.	DEPTH	LEGEND	CLASSIFICATION OF MATERIALS	% REC.	BOX OR SAMPLE	RQD OR UD	REMARKS	BLOWS/0.5 FT.	N-VALUE																		
				73	11		SPT Sampler	7 7	14																		
				60	12		SPT Sampler	8 7	16																		
				67	13		SPT Sampler	10 15	25																		
				73	14		SPT Sampler	4 4	20																		
-38.0	21.3			33	15		SPT Sampler	8 50/0.3'																			
			LIMESTONE, hard, slightly weathered, fine-grained, medium, vuggy, dark gray	67		RQD 0	4 x 5-1/2" Diamond Set Bit																				
			At El. -39.5 Ft., fossiliferous																								
				57	1	BOX RQD 0	4 x 5-1/2" Diamond Set Bit																				
-42.5	25.8																										
			NOTES:				140# hammer w/30" drop used with 2.0' split spoon (1-3/8" I.D. x 2" O.D.).																				
			1. Soils are field visually classified in accordance with the Unified Soils Classification System.																								
			2. Laboratory Testing Results																								
			<table border="1"> <thead> <tr> <th>SAMPLE ID</th> <th>SAMPLE DEPTH</th> <th>LABORATORY CLASSIFICATION</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>0.0/1.5</td> <td>SP*</td> </tr> <tr> <td>4</td> <td>4.5/6.0</td> <td>SP*</td> </tr> <tr> <td>7</td> <td>9.0/10.5</td> <td>SP*</td> </tr> <tr> <td>10</td> <td>13.5/15.0</td> <td>SP*</td> </tr> <tr> <td>14</td> <td>19.5/21.0</td> <td>SP-SM*</td> </tr> </tbody> </table>	SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION	1	0.0/1.5	SP*	4	4.5/6.0	SP*	7	9.0/10.5	SP*	10	13.5/15.0	SP*	14	19.5/21.0	SP-SM*						
SAMPLE ID	SAMPLE DEPTH	LABORATORY CLASSIFICATION																									
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4	4.5/6.0	SP*																									
7	9.0/10.5	SP*																									
10	13.5/15.0	SP*																									
14	19.5/21.0	SP-SM*																									
			*Lab visual classification based on gradation curve. No Atterberg limits.																								

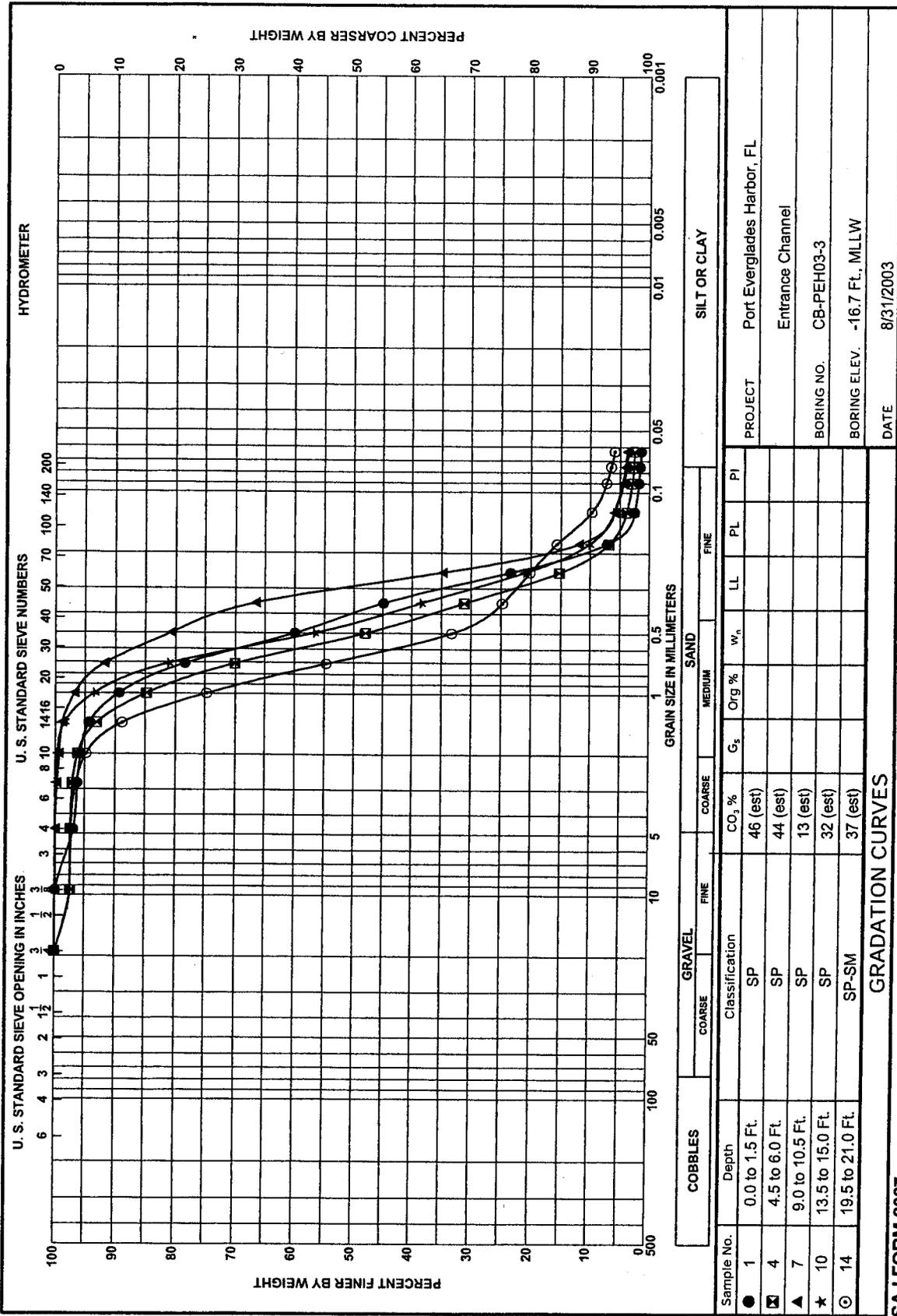




Sample No.	Depth	Classification	GRAVEL			SAND			SILT OR CLAY		
			COARSE	FINE	COARSE	MEDIUM	FINE	COARSE	LL	PL	PI
● 1	0.0 to 1.5 Ft.	SP	CO <sub>3</sub> %	G <sub>s</sub>	Org %	w <sub>n</sub>					
☒ 5	6.0 to 7.5 Ft.	SP	42 (est)								
▲ 9	12.0 to 13.5 Ft.	SP	34 (est)								
★ 12	16.5 to 18.0 Ft.	SP	43 (est)								
◎ 16	22.5 to 24.0 Ft.	SP-SM	54 (est)								
			3 (est)								

PROJECT: Port Everglades Harbor, FL  
 Entrance Channel  
 BORING NO. CB-PEH03-2  
 BORING ELEV. -16.4 Ft., MLLW  
 DATE 8/31/2003





U. S. STANDARD SIEVE OPENING IN INCHES: 100, 6, 4, 3, 2, 1 1/2, 1, 3/4, 3/8, 3/16, 1/8, 3/32, 1/32

U. S. STANDARD SIEVE NUMBERS: 10, 20, 30, 40, 50, 60, 70, 80, 100, 140, 200

HYDROMETER: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

PERCENT FINER BY WEIGHT (left y-axis): 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

PERCENT COARSER BY WEIGHT (right y-axis): 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

GRAIN SIZE IN MILLIMETERS: 500, 100, 50, 10, 5, 2, 1, 0.5, 0.25, 0.1, 0.075, 0.05, 0.025, 0.01, 0.005, 0.001

Sample No.	Depth	COBBLES		GRAVEL		SAND			SILT OR CLAY			
		COARSE	FINE	COARSE	FINE	COARSE	MEDIUM	FINE	PI	PL	LL	
● 1	0.0 to 1.5 Ft.			CO <sub>2</sub> %	G <sub>s</sub>	w <sub>n</sub>	Org %					
■ 4	4.5 to 6.0 Ft.			46 (est)								
▲ 7	9.0 to 10.5 Ft.			44 (est)								
★ 10	13.5 to 15.0 Ft.			13 (est)								
◎ 14	19.5 to 21.0 Ft.			32 (est)								
				37 (est)								

PROJECT: Port Everglades Harbor, FL

ENTRANCE CHANNEL

BORING NO.: CB-PEH03-3

BORING ELEV.: -16.7 Ft., MLLW

DATE: 8/31/2003

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