

**NASSAU COUNTY, FLORIDA  
SHORE PROTECTION  
PROJECT**

**FINAL  
ENVIRONMENTAL ASSESSMENT**

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

FEBRUARY 1999



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

REPLY TO  
ATTENTION OF

**SHORE PROTECTION PROJECT  
NASSAU COUNTY, FLORIDA**

**UPDATED FINDING OF NO SIGNIFICANT IMPACT**

The proposed project is the restoration and continued nourishment of a total of 4.3 miles of beach from the south jetty of the Kings Bay/Fernandina Entrance Channel south to Sadler Road. Initial construction will be the 3.6 miles from Sadler road north to 0.7 miles south of the south jetty in Nassau County, Florida. Re-nourishment of this stretch of the project is expected to occur every five years. The northern 0.7 miles of the project are used annually as a placement site for sand dredged from the entrance channel during operations and maintenance activities for the Kings Bay Entrance Channel at the St. Mary's River. This FONSI is an update of a FONSI signed on March 17, 1999 by Colonel Joe Miller of the Jacksonville District. District staff have reviewed the Final Environmental Assessment (EA) and the 1999 FONSI and updated consultations with Federal and State Resource agencies and added those consultations to this report. I have reviewed the Final 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:

- a. The work will be conducted in accordance with the August 18, 2003 Biological Opinion issued by the U.S. Fish and Wildlife Service for impacts to nesting sea turtles (which updated the 1997 Biological opinion included in the original EA), and the 1997 Regional Biological Opinion (RBO) issued by the National Marine Fisheries Service (NMFS) for impacts to sea turtles in the water. An August 10, 2004 letter from NMFS grants concurrence for the use of the 1997 RBO. The proposed action does not jeopardize the continued existence of any threatened or endangered species or adversely impact any designated critical habitat.
- b. In accordance with the Florida State Historic Preservation Officer's letter of November 4, 2004, it was determined that the proposed dredging and beach placement will not impact any sites of cultural or historical significance due to mitigation measures incorporated into the project design.
- c. The proposed work has been determined to be consistent with the Florida Coastal Zone Management Program.

d. Measures to eliminate, reduce, or avoid potential impacts to fish and wildlife resources will be implemented during project construction.

e. Benefits to the public will be the storm protection measures afforded by the wider beach, continued economic stimulus, increased recreational benefits and erosion protection from replacing lost beach area, and increased nesting habitat for sea turtles.

f. State water quality standards will be met during construction.

In consideration of the information summarized, I find that the proposed Shore Protection Project for Nassau County will not significantly affect the human environment and does not require an Environmental Impact Statement. A notice of availability of the signed FONSI will be sent to Federal, State and Local agencies and the interested public.

27 DEC 2005

Date

*RM Carpenter* FON

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

**NASSAU COUNTY, SHORE PROTECTION PROJECT  
NASSAU COUNTY, FLORIDA**

**FINDING OF NO SIGNIFICANT IMPACT**

I have reviewed the planning document and the Environmental Assessment of the above cited proposed project. This Finding incorporates by reference all discussions and conclusions contained in the Environmental Assessment enclosed herein. Based on information analyzed in the Environmental Assessment and on pertinent data obtained from cooperating Federal agencies having jurisdiction and/or special expertise, and information obtained from the interested public, I conclude that the considered action will have no significant affect on the quality of the human environment. Reasons for this conclusion are, in summary:

a. Both the National Marine Fisheries Service and the U. S. Fish and Wildlife Service have concurred that there will be no adverse effects on threatened and endangered species.

b. Measures to eliminate, reduce, or avoid potential effects to fish and wildlife resources will be implemented (EA sec. 5.00, Environmental Commitments).

c. Pending completion of consultation with the State Historic Preservation Officer (SHPO) and ongoing site investigations, sites of cultural or historical significance may be affected. Treatment of eligible historic resources would be coordinated with SHPO and other agencies as required by law.

d. State water quality standards will be met.

e. Benefits to the public will be protection of upland residences and businesses as well as associated infrastructure along an erosive beach from storm generated wave energy.

In consideration of the information summarized, I find that the considered action does not necessitate that an Environmental Impact Statement be undertaken. A notice of availability of the FONSI will be sent to agencies, organizations and the public.

Date:

Joe R. Miller  
Colonel, U. S. Army  
District Engineer

TABLE OF CONTENTS

<u>SUBJECT</u>	<u>PAGE NO.</u>
<b>1.00 PROJECT PURPOSE AND NEED</b> .....	EA-1
1.01 <u>Project Authority</u> .....	EA-1
1.02 <u>Project Location</u> .....	EA-1
1.03 <u>Need and Description of Proposed Action</u> .....	EA-1
 <b>2.00 ALTERNATIVES</b> .....	 EA-1
2.01 <u>Alternative Shore Protection Measures</u> .....	EA-1
2.02 <u>No Action</u> .....	EA-2
2.03 <u>Authorized Project</u> .....	EA-2
 <b>3.00 AFFECTED ENVIRONMENT</b> .....	 EA-2
3.01 <u>General Environmental Setting</u> .....	EA-2
3.02 <u>St. Marys River</u> .....	EA-2
3.03 <u>Beach</u> .....	EA-3
3.04 <u>Borrow Area</u> .....	EA-3
3.05 <u>Fish and Wildlife Resources</u> .....	EA-3
3.06 <u>Threatened or Endangered Species</u> .....	EA-4
3.07 <u>Historic Properties</u> .....	EA-4
3.08 <u>Water Quality</u> .....	EA-4
3.09 <u>Hazardous and Toxic Wastes</u> .....	EA-5
3.10 <u>Aesthetic Resources</u> .....	EA-5
3.11 <u>Coastal Barrier Resources</u> .....	EA-5
3.12 <u>Acoustical Quality</u> .....	EA-5
3.13 <u>Air Quality</u> .....	EA-6
3.14 <u>Recreation</u> .....	EA-6
 <b>4.00 ENVIRONMENTAL EFFECTS</b> .....	 EA-6
4.01 <u>General Environmental Setting</u> .....	EA-6
4.02 <u>Fish and Wildlife Resources</u> .....	EA-6
4.03 <u>Threatened or Endangered Species</u> .....	EA-7
4.04 <u>Historic Properties</u> .....	EA-8
4.05 <u>Water Quality</u> .....	EA-9
4.06 <u>Hazardous and Toxic Wastes</u> .....	EA-9
4.07 <u>Aesthetic Resources</u> .....	EA-9
4.08 <u>Coastal Barrier Resources</u> .....	EA-9
4.09 <u>Acoustical Quality</u> .....	EA-9
4.10 <u>Air Quality</u> .....	EA-9
4.11 <u>Recreation</u> .....	EA-9
 <b>5.00 ENVIRONMENTAL COMMITMENTS</b> .....	 EA-9

<u>SUBJECT</u> .....	<u>PAGE NO.</u>
<b>6.00 COMPLIANCE WITH ENVIRONMENTAL STATUTES</b> .....	EA-11
6.01 <u>National Environmental Policy Act of 1969, as amended</u> .....	EA-11
6.02 <u>Endangered Species Act of 1973, as amended</u> .....	EA-11
6.03 <u>Fish and Wildlife Coordination Act of 1958, as amended</u> .....	EA-12
6.04 <u>National Historic Preservation Act of 1966, as amended (PL 89-665)</u> .....	EA-12
6.05 <u>Clean Water Act of 1972, as amended</u> .....	EA-12
6.06 <u>Clean Air Act of 1972, as amended</u> .....	EA-12
6.07 <u>Coastal Zone Management Act of 1972, as amended</u>	EA-12
6.08 <u>Marine Mammal Protection Act of 1972, as amended</u>	EA-12
6.09 <u>Farmland Protection Policy Act of 1981</u> .....	EA-12
6.10 <u>Estuary Protection Act of 1968</u> .....	EA-12
6.11 <u>E.O. 11990, Protection of Wetlands</u> .....	EA-12
6.12 <u>E.O. 11988, Floodplain Management</u> .....	EA-13
6.13 <u>E.O. 12898, Environmental Justice</u> .....	EA-13
<b>7.00 COORDINATION</b> .....	EA-13
<b>8.00 PUBLIC INVOLVEMENT</b> .....	EA-13
<b>9.00 LIST OF PREPARERS</b> .....	EA-13
<b>10.00 LIST OF REVIEWERS</b> .....	EA-13
<b>11.00 REFERENCES</b> .....	EA-13
<b>12.00 APPENDICES</b> .....	EA-15

## ENVIRONMENTAL ASSESSMENT

### 1.00 PROJECT PURPOSE AND NEED

1.01 Project Authority. The Nassau County, Florida, Shore Protection Project (SPP) Study was authorized by the Water Resources Development Act of 1988 (Public Law 100-676). The authorization was preceded by a Final Environmental Impact Statement published in March 1985.

1.02 Project Location. Nassau County is located in northeastern Florida along the Atlantic Ocean. It is bordered to the north and west by the state of Georgia and to the south by Duval County, Florida.

1.03 Need and Description of Proposed Action. The authorized Nassau County, Florida, SPP provides for initial restoration of 3.6 miles of eroded beach from Sadler Road to 0.7 miles south of the south jetty; and, periodic nourishment of 4.3 shoreline miles from the south jetty to Sadler Road. At the request of the state of Florida, the District is also evaluating alternatives to the erosion problems associated with Ft. Clinch State Park (FCSP).

Project design includes a 40 foot berm extending from the pre-project +10.4 contour (referenced to national geodetic vertical datum). The foreshore will be appropriately sloped out to the existing bottom. The project would provide for initial restoration and future nourishment of the design beach profile. Advance nourishment material would be placed at the time of construction to offset anticipated erosion losses between nourishments. Initial construction will require placement of approximately 2,500,000 cubic yards (900,000 cy. design volume + 1,600,000 cy. advance nourishment) of beach quality material with characteristics similar to the native sand. The primary borrow source identified is immediately south of the south jetty. Due to the amount of erosion which has occurred since the last nourishment, the above amounts of sand are required to protect the SPP area which is developed with primarily single-family houses.

The recommended plan for the Fort Clinch erosion control segment includes construction of a revetment. The crest height of the revetment is +8.0 feet Mean Low Water.

## **2.00 ALTERNATIVES**

2.01 Alternative Shore Protection Measures. Alternatives, such as, groins, offshore breakwaters, and nonstructural plans were all considered during the original project study. A thorough description of the potential environmental effects of each alternative and the reasons for alternative selection and/or dismissal are described in detail in the 1985, Feasibility Report and Final Environmental Impact Statement, Beach Erosion Control Study, Nassau County, Florida.

2.02 No Action. A basic alternative to any plan is the no action alternative which allows nature to take its course. In this case, the no action alternative would allow the beaches to further erode over time. The current state of erosion would significantly increase the threat of wave and tidal storm damage to residences and businesses along the shoreline as well as virtually eliminate oceanfront recreation for the residents and tourists of Nassau County. This alternative is not considered viable.

2.03 Authorized Project. The original alternative analysis resulted in the selection of the current authorized project. Subsequent project modeling and engineering analyses were used to determine the need for the project's expansion, and the design for and amount of material needed to efficiently restore the SPP area.

## **3.00 AFFECTED ENVIRONMENT**

3.01 General Environmental Setting. The State of Florida is a portion of the Floridian Plateau which is exposed as dry land during periods of relative drops in sea level. Each retreat of the sea leaves behind a wide variety of hard mineral deposits, which were previously moved about by waves and currents. The movement of these deposits has formed present day sandy beaches, offshore bars, and barrier islands and comprise the key elements of the Nassau County SPP area. The entire borrow area and portions of the SPP area north of State Route 200, Atlantic Boulevard, occur within the Fort Clinch Aquatic Preserve (FCAP). Waters adjacent to the Preserve are designated by the State as Outstanding Florida Waters (OFWs) and, as such, receive Florida's highest protection under the State's water quality standards.

3.02 St. Marys River. The St Marys River discharges to the Atlantic Ocean north of the project area, and is a key element in shaping the Nassau County SPP area. Once a natural channel, the

inlet has been dredged to 42 feet primarily to provide access/egress for vessels from the St. Marys Naval Base. Sand drifting into the channel is no longer a natural source of beach material. However, recent sand-tightening of the south jetty has reduced the amount of sand lost to the inlet.

3.03 Beach. At high tide and especially during storm events, the beach is inundated up to the base of the dunes. Vegetated dunes occur on the extreme northern and southern portions of the SPP area, but otherwise, are narrow to non-existent along most of the project's length. At severely eroded locations only a bulldozed berm separates and protects, primarily, single-family homes from the dynamic conditions of the beach. The vegetated dunes are dominated by a mixture of sea oats (*Uniola paniculata*), beach pennywort (*Hydrocotyle umbellata*), gaillardia (*Gaillardia pulchella*), saltwort (*Batis maritima*), sea rocket (*Cakile edentula*), railroad vine (*Ipomoea pes-caprea*), prickly pear cactus (*Opuntia compressa*) and beach tea (*Croton punctatus*).

3.04 Borrow Area. Beach compatible material would be obtained from a borrow site which extends oceanward from the end of the south jetty and parallels the inlet channel. The borrow site lies in 13-25 feet of water, contains about 15 million cubic yards of material, and consists primarily of beach quality sand. (The beach and borrow areas are further described in the U.S. Fish and Wildlife Final Coordination Act Report, Appendix C).

3.05 Fish and Wildlife Resources. The biological communities found in the project area are all well adapted to the particular conditions associated with the supralittoral beach zone and the intertidal swash zone (Nelson 1985). A species list of the organisms in the SPP area is given in the U.S. Fish and Wildlife Service's Final Fish and Wildlife Coordination Act Report, Appendix C. A dominant invertebrate found along the shoreline of Nassau County is the Atlantic coquina clam, *Donax variabilis*. The biological communities in the highly dynamic intertidal swash zone must cope with being aerially exposed during normal tidal cycles as well as being subjected to the high energy of the ocean waves. Typically, these organisms have low species diversity because of the harshness of the environmental conditions present. However, animals that are able to successfully adapt to these dynamic conditions are faced with very little competition from other organisms. It is because of this lack of competition and adaptability to the dynamic conditions found along the project area that *D. variabilis* is able to numerically dominate the biological community (Edgren 1959). Receding waves tend to wash amphipods and isopods out of their burrows and suspend these organisms into the water column where they serve as an important food source for a variety of nearshore fish. A variety of polychaete worms that are also adapted to this highly dynamic and stressful environment can be found within the intertidal zone of

the Nassau County beaches. These intertidal organisms also provide an important food source for foraging shore and wading birds. Highly visible decapod crustaceans of the Nassau County supralittoral zone include the ghost crab (*Ocypode quadrata*), mole crab (*Emerita talpoida*), and Atlantic fiddler crab (*Uca pugilator*). These organisms are highly motile and burrow into the moist sand for refuge and to retard water evaporation from their bodies during aerial exposure (Barnes 1974).

3.06 Threatened or Endangered Species. The supralittoral zone of the project area provides nesting habitat for the endangered green sea turtle (*Chelonia mydas*) and the threatened loggerhead sea turtle (*Caretta*). In addition, the endangered West Indian manatee (*Trichechus manatus*) frequently migrates in and out of the St. Marys River. During the winter months, the Atlantic coast of Florida is inhabited by migrating cetaceans such as the endangered right whale (*Eubalaena glacialis*) the finback (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), right (*Eubalaena glacialis*), sei (*Balaenoptera borealis*), and sperm (*Physeter catodon*) whales.

3.07 Historic Properties. Archival research and a marine based archeological survey have been conducted for the proposed borrow areas south of the harbor entrance channel. Of the 22 magnetic and sonar targets identified, 12 exhibit characteristics that indicate that they may be submerged historic shipwrecks or associated cultural materials. Archeological divers have investigated these targets. Data analysis and coordination with the Florida State Historic Preservation Officer (SHPO) is being completed at this time. All fieldwork and data analysis will be completed under the direct supervision of a qualified archeologist with experience in marine based surveys and maritime architecture. Fort Clinch is a Civil War era fort located at the north end of Amelia Island. The fort is included in the National Register of Historic Places and is a significant part of the history of north Florida and the country.

3.08 Water Quality. The project area is a sandy, high energy coastline. The beach is predominantly quartz sand. Due to the high energy conditions found along the Nassau County coastline, sand is continuously resuspended in the water column with each breaking wave. This resuspension results in highly turbid conditions normally being found throughout the project area. The coastal waters in the area of the authorized work are designated by the State of Florida as Class III. Class III waters are designated as suitable for recreation and the propagation of fish and wildlife. Strict control over water quality is addressed by the Florida Department of Environmental Protection (FLDEP) in applying specific water quality monitoring requirements during the dredging and beach fill operations stage.

3.09 Hazardous and Toxic Wastes. The coastline in the project area is located adjacent to predominantly residential and recreational areas. There are no known industrial activities in the immediate area. There are no known sources of hazardous and toxic wastes in the project area and no records of such activities in the past.

3.10 Aesthetic Resources. Aesthetics found along most of the project area can be valued in the moderate range. The intertidal area is minimal and the beaches narrow due to the extreme erosion since the early 70's. In the Ft. Clinch Park portion of the SPP area, pleasing natural conditions remain but even here overwash from the ocean and some erosion has occurred. The residential areas consist of some backdune naturalized areas with dune grasses, morning glory, and other native flowering groundcovers. The few commercial areas generally develop right up to the beach leaving little backdune, dune, or native vegetation present. The majority of Nassau County beaches have some dunes with native vegetation present as the result of previous efforts to restore the beach through erosion control measures. These past maintenance efforts greatly improved the aesthetics of the Nassau County beaches.

3.11 Coastal Barrier Resources. The Coastal Barrier Resources Act of 1982 (Public Law 97-348) encouraged implementation of conservation measures on largely undeveloped coastal barrier islands along the Atlantic and Gulf of Mexico coasts. These conservation measures were designed to help conserve critical habitat for a variety of island flora and fauna. Due to the urbanization and highly developed nature of the Nassau County SPP area there is little available terrestrial habitat in the immediate project area to support large numbers of diverse plants and animals. Only the portion of the SPP area within the FCSP is within the Coastal Barrier Resources System. However, it is designated by that System as an "otherwise protected area." Under State authority, ecological resources within the FCSP are more than adequately maintained and protected.

3.12 Acoustical Quality. The project area is a favorite recreational spot for the beach residents who reside in the area as well as the tourists who temporarily reside in the high rise hotels and condominiums. Additionally, the Nassau County beaches are a favorite spot for many of the residents that reside in northeastern Florida. Because of the urbanization in the vicinity of the beaches, and the popularity of the beaches, noise levels are usually elevated during the tourist season as well as on most weekends.

3.13 Air Quality. The urbanization of the SPP area and the popularity of the beaches all contribute to a large number of motorized vehicles being in the vicinity of the SPP. Because of

the sea breezes that are usually present along the Nassau County shore, air quality is generally regarded as good as airborne pollutants are readily dispersed by the ocean generated winds.

3.14 Recreation. The project area is a local favorite for county residents to spend much of their leisure time sunbathing, sailing, walking, and riding bicycles, in addition to a variety of other active and passive activities. The spring, summer, and fall months of the year are the most active times with the summer months comprising the peak use period. During the winter months, the Nassau County beaches are generally used by relatively few people due primarily to relatively low temperatures (40°F - 60°F) and the frequency of northeast winds which produce strong waves and high tides.

**4.00 ENVIRONMENTAL EFFECTS.** This section provides a means of assessing the environmental consequences of the authorized project on natural resources in the project area. A complete analysis of alternative plans including the no action alternative, is contained in the 1985 Final Environmental Impact Statement, Beach Erosion Control Study, Nassau County, Florida.

4.01 General Environmental Setting. The installation of sand trap fencing and native salt tolerant vegetation along the project area will help to control and conserve wind blown sand. Completion of the project will ensure that a wide beach exists at high tide as well as a protective sand dune system above the supralittoral zone. The new beach will have a positive effect on the existing dune system. Besides providing protection to the dunes from wave and tidal generated energy, opportunistic and salt tolerant grasses and other beach vegetation will tend to trap wind blown sand, thereby further building up the dune system in the project area. Addition of a beach and dune system will provide increased foraging habitat for many small birds, mammals, and reptiles as well as protection from storm waves and tides for residents and infrastructure of the coastline.

4.02 Fish and Wildlife Resources. During the beach renourishment construction phase, there may be some displacement of foraging and resting activities for birds as well as small mammals and reptiles that utilize the project area. This displacement will be short-term, and there exists ample areas north and south of the project area with similar characteristics that may be utilized by displaced species while construction activities are ongoing. After the initial construction, invading grasses and other beach vegetation will provide additional refuge and foraging opportunities to small rodents and reptiles. The Nassau County nearshore waters are naturally turbid because of the highly dynamic physical conditions present in the area. Organisms inhabiting this shoreline must be readily adapted to

these turbid conditions in order to successfully survive. Therefore, elevated turbidity levels from placement of fill material on the beach is not expected to have a significant detrimental effect to such sightfeeders as the brown pelican (*Pelecanus occidentalis*) or other shorebirds, waterfowl and wading birds.

The inhabitants of the intertidal zone typically possess high fecundity and rapid turnover rates during the summer breeding season. Populations of the mollusk, *Donax variabilis*, and species of crustaceans, in areas of beach nourishment usually become numerically abundant once again after six months. This resurgence is most likely from littoral transport of larvae from adjacent areas (Mikkelson 1981). Because of this, long term effects on infaunal invertebrates inhabiting the intertidal zone along the beaches of Nassau County are not expected to be significant. The highly visible decapod crustaceans of the Nassau County supralittoral zone such as the ghost crab (*Ocypode quadrata*), mole crab (*Emerita talpoida*), and the Atlantic fiddler crab (*Uca pugilator*) are all highly motile organisms and are easily adapted to avoiding unacceptable environmental conditions. Reilly and Bellis (1978, 1983) have concluded that direct burial by beach nourishment activities is not a major mortality source as these crabs are able to actively avoid the nourished area or burrow up through the overburden material, if necessary. Marsh and Turbeville (1981) examined benthic communities near Hallandale Beach, Florida, seven (7) years after a beach nourishment project and concluded that no long term effects were observed for the infaunal benthos. Saloman and Naughton (1984) saw no significant numerical differences in biological communities between beach deposition and non-deposition areas after six (6) weeks following beach fill operations off Panama City, Florida. In summary, no long term adverse effects are expected to organisms in the supralittoral or intertidal zone from the Nassau County Shore Protection Project.

#### 4.03 Threatened or Endangered Species.

Sea turtles are organisms of major concern as they use the supralittoral zone for nesting activities and the nearshore areas for foraging. Providing the eroding shoreline of Nassau County with beach fill will result in widening the beach berm and increasing the beach area that is available to nesting threatened and endangered species. The possible effects on nesting sea turtles are thoroughly discussed in Appendix C. To ensure that the project will have little to no effect on sea turtles, special precautions will be taken to protect nesting sea turtles and emerging hatchlings with prior approval of the U.S. Fish and Wildlife Service. These special precautions are listed in the Environmental Commitments Section (5.00) of this EA.

The only known calving ground of the North Atlantic right whale

(*Eubalaena glacialis*) is located off the coast of Florida, Georgia, and South Carolina (Slay 1992). The calving season for this species in northeastern Florida usually occurs between November-March (Slay 1992). It is the migratory patterns of these cetaceans between the winter calving grounds of the southeastern United States and the summer feeding grounds of Maritime Canada that make them most vulnerable to collisions with moving vessels. From the best available evidence, collisions with moving vessels are the most common human-induced mortality among the above mentioned cetacean species in the southeastern United States (Slay 1992). In addition, the endangered West Indian manatee (*Trichechus manatus*) frequently migrates in and out of the St. Marys River. Efforts to eliminate or significantly reduce the potential effects of boat collisions with cetaceans and manatees are described in the Environmental Commitments Section (5.00) of this EA.

4.04 Historic Properties. As stated in paragraph 3.07 above, of the 22 magnetic and sidescan sonar targets identified in the borrow areas, 12 exhibit characteristics that may represent resources eligible for inclusion in the National Register of Historic Places. Because of the distribution of the targets and the high potential for significant historic shipwreck sites in the vicinity, archeological diver investigations have been conducted. These investigations will identify the nature of the targets and evaluate their significance (eligibility for inclusion in the National Register). Based on data gathered by the archeologists, a plan for data recovery or avoidance will be developed for targets that are determined to be significant cultural materials. Analysis of the data is being conducted at this time under the direct supervision of a qualified archeologist with experience in marine-based surveys and maritime architecture. Results of the diver investigations and determinations of effect will be coordinated with the Florida State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation, as required for compliance with the 36 CFR Part 800 and Section 106 of the National Historic Preservation Act. Placement of sand on the beach will have no adverse effect on known significant historic properties. The fort is included in the National Register of Historic Places and is a significant part of the history of north Florida and the country. Project features in the vicinity will affect the fort, but the affect will not be adverse.

4.05 Water Quality. During project construction, an insignificant increase in turbidity in the immediate area can be expected from beach fill operations. As the background turbidity in the project area is elevated by dynamic surf zone conditions, elevated increases in turbidity will be temporary and not expected to detrimentally affect nearshore zone organisms.

4.06 Hazardous and Toxic Wastes. The project will not involve placement, use or storage of hazardous and toxic materials in or near the project area. All wastes and refuse generated by the project will be properly stored and removed when the project activities are completed.

4.07 Aesthetic Resources. The project will restore beaches which have been severely eroded by high tides, storm generated waves, and heavy winds. Restored beach and dune areas will help restore the natural appearance and thus the aesthetic resources of the Nassau County beaches.

4.08 Coastal Barrier Resources. The project will not affect Coastal Barrier Resources.

4.09 Acoustical Quality. The immediate project area may experience an increase in noise levels during the beach fill construction phase. Construction equipment will be properly maintained in order to minimize the effects of noise. The elevated noise levels will be localized in nature and will not persist because of the brief, temporary nature of the construction activity.

4.10 Air Quality. There will be no long term accumulation of particulates in the project area because offshore sea breezes are likely to disperse pollutants away from the barrier island and the construction activity is brief and temporary in nature. No air quality permits are required for this permit.

4.11 Recreation. Once the Nassau County beach renourishment project is complete, the beach will contain a larger sand berm which will provide more space for both active and passive saltwater beach recreation activities. A wider sand berm along the beach will provide for improved family oriented recreation activities which is a significant tourist and county resident attraction. The additional sand will also function to help separate active and passive recreational activities.

**5.00 ENVIRONMENTAL COMMITMENTS.** The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing, or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

(1) Inform contractor personnel of the potential presence of whales, sea turtles and manatees in the borrow and/or beach fill areas, their endangered status, the need for precautionary measures, and the Endangered Species Act prohibition on taking and/or harassing any of these species.

(2) During transport to/from the offshore borrow or beach

fill areas, personnel will take precautions to avoid collisions with sea turtles, manatees, and whales. Vessels transporting personnel between offshore and nearshore areas shall follow routes of deep water whenever possible. A lookout will be posted on all dredge and support ships operating offshore between November and March to minimize potential collisions with sea turtles, manatees and whales.

(3) The project beach will be visually inspected each morning between April 15 and November 30. If beach construction activities are undertaken between April 15 and November 30, any sea turtle nest found within an area to be renourished will be relocated between sunrise and 09:00 a.m. to a non-renourishment beach location or hatchery. Nest surveys and relocations will be conducted daily by personnel with prior experience and training in these procedures and with a valid Florida Department of Environmental Protection permit. Nesting surveys shall be initiated 65 days prior to nourishment activities or by April 15, whichever is later. Nesting surveys shall continue through the end of the project or through September 30, whichever is earlier. If nests are made in areas where they may be affected by construction activities, eggs shall be relocated according to measures described in Appendix C.

(4) Immediately following completion of beach renourishment and prior to April 15 for 3 subsequent years, sand compaction shall be monitored in the restoration area according to a protocol agreed to by the FWS, the State regulatory agency, and the Corps as indicated in Appendix C.

(5) According to timing indicated in (4), any escarpment interfering with turtle nesting or in excess of 18 inches and longer than 100 feet, will be mechanically leveled to the natural beach contour just prior to April 15. Additional procedures for escarpment control and construction schedules and methods are given in Appendix C. Any measures taken during the nesting season to correct beach conditions unfavorable to turtle nesting will not result in the taking of any turtle nests, hatchlings or individual/s.

(6) If any nest is relocated to a safer beach location, a report describing the actions taken, description of nest location, and names and qualifications of personnel involved in the nest survey and relocation will be submitted to the U.S. Fish and Wildlife Service, Jacksonville Field Office within 60 days after completion of the beach renourishment project.

(7) Any incident involving the death or injury of any endangered or threatened species shall be immediately reported to the U.S. Army Corps of Engineers, National Marine Fisheries Service, U.S. Fish and Wildlife Service, and the Florida

Department of Environmental Protection for investigation to determine the most appropriate course of action.

(8) Turbidity shall be monitored at the beach fill nearshore area. Should monitoring reveal turbidity levels above State standards (> 29 NTU's above background), construction activities will be immediately suspended until turbidity levels return to within acceptable standards as specified in the State water quality permit.

(9) Archeological diver investigations have been conducted for potentially significant magnetic targets identified within the borrow area. Analysis of the data is being completed at this time. Reports resulting from these investigations and a plan for treatment of potentially significant historic properties will be developed and coordinated with the Florida State Historic Preservation Officer (SHPO) and the Advisory Council on Historic Preservation. Treatment alternatives may include avoidance or data recovery.

(10) Nassau County shall monitor, mark and avoid sea turtle nests for three years after project construction.

The above commitments are discussed in more detail in the U.S. Fish and Wildlife Service's Coordination Act Report, Biological Opinion (Appendix C).

## **6.00 COMPLIANCE WITH ENVIRONMENTAL STATUTES**

6.01 National Environmental Policy Act of 1969, as amended. Environmental information on this authorized project has been compiled and the interested public will be notified that this Environmental Assessment has been prepared in accordance with the National Environmental Policy Act.

6.02 Endangered Species Act of 1973, as amended. This project has been fully coordinated with agencies which administer this Act and a list of endangered, threatened, proposed, or candidate species was received from the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). Accordingly, this project is in full compliance with the Act.

6.03 Fish and Wildlife Coordination Act of 1958, as amended. The proposed renourishment is not expected to significantly affect infaunal or epifaunal invertebrates or motile ichthyofauna. In the most recent correspondence (Appendix C), the U.S. Fish and Wildlife Service has advised the Corps that no adverse effects to fish and wildlife resources are expected to occur from implementation of this project. The environmental concerns related to this project have been coordinated with the U.S. Fish and Wildlife Service; therefore, this project is in

full compliance with this Act.

6.04 National Historic Preservation Act of 1966, as amended (PL 89-665). Research, determinations of effect, and consultation with the Florida State Historic Preservation Officer will be completed according to the guidelines established in 36 CFR Part 800 and Section 106 of the Act.

6.05 Clean Water Act of 1972, as amended. All State water quality standards will be met. A Section 404(b) Evaluation was prepared and is included in this report as Appendix A.

6.06 Clean Air Act of 1972, as amended. No permits will be required for this project. Full compliance will be achieved with receipt of comments on the EA from the U.S. Environmental Protection Agency.

6.07 Coastal Zone Management Act of 1972, as amended. The State of Florida has determined that this study is in full compliance with the Florida Coastal Management Program. A federal consistency determination is included in this report as Appendix B.

6.08 Marine Mammal Protection Act of 1972, as amended. Incorporation of the safeguards used to protect threatened or endangered species during dredging and disposal operations will also protect any marine mammals in the area; therefore, this project is in compliance with the Act.

6.09 Farmland Protection Policy Act of 1981. No prime or unique farmland will be affected by implementation of this project. This act does not apply.

6.10 Estuary Protection Act of 1968. No designated estuary will be affected by project activities. This act does not apply.

6.11 E.O. 11990, Protection of Wetlands. No wetlands will be affected by project activities. This project does not apply to the goals addressed in this Executive Order.

6.12 E.O. 11988, Floodplain Management. No project activities will take place within a floodplain; therefore this Executive Order does not apply.

6.13 E.O. 12898, Environmental Justice. The proposed action would not impact human health and would not substantially impact the environment. The impacts would not be disproportionately high towards minority or low-income populations. We are not aware of any use of the proposed project area for subsistence consumption of fish and wildlife. The proposed action would not

impact such subsistence consumption if any is associated with the project area.

**7.00 COORDINATION.** The June 1998 Nassau County, Florida, SPP draft report, EA and Finding of No Significant Impact (FONSI) were coordinated with the following Federal and State agencies: U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Environmental Protection Agency, Florida State Historic Preservation Officer (SHPO), and Florida Department of Environmental Protection. These documents were also coordinated with local and regional planning agencies, and the public. Response comments are contained in Appendix D of the EA, Pertinent Correspondence. The final EA and FONSI were appropriately modified based on these comments. A mailing list of these groups and individuals is maintained at the District Office and may be consulted upon request.

**8.00 PUBLIC INVOLVEMENT.** The draft report, EA and FONSI were sent to all interested agencies/individuals and remain available to the public at the District Office upon request.

**9.00 LIST OF PREPARERS.** This EA was prepared by the following U.S. Army Corps of Engineers personnel:

William J. Lang, Biologist and principal author  
Janice E. Adams, Archeologist  
Paul C. Stevenson, Landscape Architect

**10.00 LIST OF REVIEWERS.** This EA was reviewed by:

Mr. Kenneth Dugger, Chief, Environmental Coordination  
Section

**11.00 REFERENCES.**

Barnes, R.D. 1974. Invertebrate Zoology. Third Edition. W.B. Saunders Company. Philadelphia.

Barnes, R.S.K. and R.N. Hughes. 1988. An Introduction to Marine Ecology. Second Edition. Blackwell Scientific Publications. New York.

Conley, W.J. and B.A. Hoffman. 1986. Florida Sea Turtle Nesting Activity: 1979-1985. Florida Department of Natural Resources. Florida Marine Research Institute. St. Petersburg.

Cutler, J.K. and S. Mahadevan. 1982. Long-term effects of beach renourishment on the benthic fauna of Panama City, Florida. U.S. Army Corps of Engineers, Coastal Engineering Research Center. Misc. Report No. 82-2.

- Edgren, R.A. 1959. Coquinas (*Donax variabilis*) on a Florida beach. *Ecology* **40**:498-502.
- Gorzelany, J.F. 1983. The effects of beach nourishment on the nearshore benthic macrofauna of Indiatlantic and Melbourne Beach, Florida. M.S. Thesis, Florida Institute of Technology, Melbourne, Florida.
- Johnson, A.F. and M.G. Barbour. 1990. Dunes and maritime forests. **IN:** R.L. Myers and J.J. Ewel (eds.), p. 429-480. Ecosystems of Florida. University of Central Florida Press. Orlando.
- Kraus, S.D. 1990. Rates and potential causes of mortality in North Atlantic right whales. *Mar. Mam. Sci.* **6**(4):278-291.
- Marsh, G.A. and D.B. Turbeville. 1981. The environmental impact of beach nourishment: two studies in southeastern Florida. *Shore and Beach* **49**:40-44.
- Mikkelson, P.S. 1981. A comparison of two Florida populations of the coquina clam, Donax variabilis (Bivalvia:Donacidae): intertidal density, distribution, and migration. *Veliger* **23**:230-239.
- National Marine Fisheries Service. 1991. Recovery plan for the northern right whale (*Eubalaena glacialis*). Right Whale Recovery Team. National Marine Fisheries Service. Silver Spring, Maryland.
- National Research Council. 1990. Decline of the Sea Turtles: Causes and Prevention. National Academy Press. Washington.
- Nelson, W.G. 1985. Guidelines for beach restoration projects. Part I. Biological. Florida Sea Grant College. SGR-76. Gainesville.
- Nelson, W.G. and D.D. Dickerson. 1988. Effects of beach nourishment on sea turtles. U.S. Army Corps of Engineers. Coastal Engineering Research Center. Unpublished Paper.
- Reilly, F.J. and V.J. Bellis. 1978. A study of the ecological impact on beach nourishment with dredged materials on the intertidal zone. Institute for Coastal and Marine Resources, East Carolina University Tech. Report No. 4.
- \_\_\_\_\_ 1983. The ecological impact of beach nourishment with dredged materials on the intertidal zone. U.S. Army Corps of Engineers, Coastal Engineering Research Center. Misc. Report

No. 83-3.

Saloman, C.H. and S.P. Naughton. 1984. Beach restoration with offshore dredged sand: effects on nearshore macrofauna. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration, NOAA Tech. MEM. NMFS-SEFC-133.

Slay, C.K. 1992. Maintenance dredging and aerial surveillance for right whales. U.S. Army Corps of Engineers. Jacksonville District.

US Army Corps of Engineers. 1985. Feasibility Report and Final Environmental Impact Statement, Beach Erosion Control Study, Nassau County, Florida.

US Fish and Wildlife Service. 1987. Endangered and Threatened Species of Southeastern United States. Region 4, Atlanta, Georgia.

\_\_\_\_\_ 1997. Fish and Wildlife Coordination Act Report for the General Reevaluation Report and Environmental Assessment for the Nassau County Shore Protection Project.

## **12.00 APPENDICES**

Appendix A - Section 404(b)(1) Evaluation

Appendix B - Florida Coastal Zone Management Program Federal Consistency Evaluation

Appendix C - Consultation Documents - ESA, FWCAR, EFH and SHPO

Appendix D - Pertinent Correspondence

**APPENDIX A**

**SECTION 404(B) CERTIFICATION**

SECTION 404 (b) EVALUATION REPORT  
NASSAU COUNTY SHORE PROTECTION PROJECT  
GENERAL REEVALUATION REPORT  
NASSAU COUNTY, FLORIDA

I. Project Description

a. Location. Nassau County is located in northeastern Florida along the Atlantic Ocean. It is bordered to the north and west by the state of Georgia and to the south by Duval County, Florida.

b. General Description of Project. The proposed project calls for construction of a recreational and protective beach along a 4.3 mile reach of shore from Florida Department of Environmental Protection (DNR) monument number R-9 just south of the St. Marys River Inlet to DNR monument number R-34. Fill material would be obtained by dredging sand from a borrow site just south of the St. Marys River Inlet jetty east of Amelia Island. The dunes which currently afford some protection of the existing development in the project area are low and have been observed to be overwashed during severe storm generated waves.

c. Authority and Purpose. The Nassau County, Florida, Shore Protection Project (SPP) was authorized by the Water Resources Development Act of 1988 (Public Law 100-676). The authorization was based on a Final Environmental Impact Statement published in March 1985. The authorized project provides for the initial restoration of 3.6 miles of eroded beach, starting 0.7 miles south of the south jetty and extending south to Sadler Road with periodic nourishment of 4.3 miles of shore which extends from the south jetty to the vicinity of Sadler Road.

d. General Description of Dredged or Fill Material

(1) General Characteristics of Material. The material to be dredged is beach quality material with characteristics similar to the native sand.

(2) Quantity of Material. Initial construction will require placement of approximately 2,500,000 cubic yards (900,000 cy. design volume + 1,600,000 cy. advance nourishment) of beach quality material with characteristics similar to the native sand.

(3) Source of Material. The primary borrow source is located immediately south of the south jetty. Due to the amount of erosion which has occurred since the last nourishment, the above amounts of sand are required to protect the SPP area which is developed with primarily single-family houses.

e. Description of the Proposed Discharge Site

(1) Location. The discharge site extends from the south side of the south St. Marys River Inlet jetty for 4.3 miles.

(2) Size. It is currently estimated that 2,500,000 million cubic yards of beach fill will be placed on the 4.3 mile segment of the Nassau County SPP area.

(3) Type of Site. The disposal site is a segment of eroding beach consisting primarily of existing sand, sparse beach vegetation and a low lying dune system.

(4) Type of Habitat. The supralittoral zone habitat consists primarily of eroding mineral and shell sand. A low lying dune system is present with sparse grasses and other salt tolerant vegetation inhabiting this area. The intertidal swash zone and nearshore intertidal marine habitat consists primarily of infaunal mollusks and crustaceans, epifaunal crustaceans, and polychaete worms.

(5) Timing and Duration of Discharge. The initial construction phase of the proposed project is estimated to begin in the year 2000. Once construction activities begin, it is anticipated that the project will require approximately 2-3 months to complete.

f. Description of Disposal Method. Beach compatible fill will be dredged from the proposed offshore borrow area. Hopper dredge, hydraulic pipeline, or mechanical dredging could be used to place the fill material on the beach. The material will be graded and shaped by earthmoving equipment in order to achieve the desired beach profile.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The cross-sectional configuration of the beach fill provides for a 40 foot berm extending from the pre-project +10.5 contour (referenced to national geodetic vertical datum). The foreshore will be appropriately sloped out to the existing bottom. The project would provide for initial restoration and future nourishment of the design beach profile. Advance nourishment material would be placed at the time of construction to offset anticipated erosion losses between nourishments. Initial construction will require placement of approximately 2,500,000 cubic yards (900,000 cy. design volume + 1,600,000 cy. advance nourishment) of beach quality material with characteristics similar to the native sand. The primary borrow sources identified include 2 borrow areas (A/B) immediately south of the south jetty. Due to the amount of

erosion which has occurred since the last nourishment, the above amounts of sand are required to protect the SPP area which is developed with primarily single-family houses.

The recommended plan for the Fort Clinch erosion control segment includes construction of a revetment (figure 2). The crest height of the revetment is +8.0 feet Mean Low Water. The armor stone weight will range between 2,200 to 3,600 lbs., with 75 percent of the individual stones weighing more than 2,900 lbs. Bedding stone will provide the foundation for the armor stone.

(2) Sediment Type. The sand to be used as beach fill material will be obtained from a borrow area just south of the south jetty which exhibits similar physical characteristics.

(3) Dredge/Fill Material Movement. The fill material will be subject to erosion by waves with the net movement of fill and upland material expected to be seaward, forming an offshore bar. This bar will be subject to littoral transport by longshore currents.

(4) Physical Effects on the Benthos. Non-motile benthic organisms may be directly buried by the beach fill and those found in the borrow site could be excavated. Some burrowing organisms may be able to burrow up through the fill material. Attached epifauna seaward of the project area may be impacted by both direct burial and short-term increases in turbidity levels. Because of the high fecundity and high turnover rate of many benthic invertebrates, recolonization in the project and borrow area by these species is expected in a relatively short period of time (usually within a matter of months).

(5) Other Effects. Elevated turbidity levels in the nearshore swash zone will be a temporary condition. Organisms inhabiting the intertidal zone are primarily burrowers which are readily adapted to being periodically buried by resuspended material as well as sabellarid worms which use resuspended material to build their hardened structures.

b. Water Circulation, Fluctuation and Salinity Determinations

(1) Water.

(a) Salinity. Because of water movement in and out of the project area from the dynamic oceanographic conditions found along the Atlantic coast in this area, placement of mineral sand and shell fill is not expected to change the salinity of nearshore waters.

(b) Water Chemistry. The shell and mineral sand fill does not readily break down in water. Therefore, no significant

long term changes in the chemical makeup of the nearshore environment are anticipated.

(c) Clarity. There will be a temporary increase in turbidity during the construction process. The fill material is dense (low silt content) and will resist resuspension in the water column. The oceanographic conditions in this area are very dynamic and beach material is constantly being eroded away and resuspended by wave energy. Therefore, any short-term elevated turbidity levels during the construction phase are not expected to significantly alter background water clarity seaward of the project area.

(d) Color. Fill placement will have no long-term or significant impact.

(e) Odor. The fill material is an odorless mixture of shell and carbonate sand.

(f) Taste. Fill material will have no effect on taste.

(g) Dissolved Gas Levels. Even with elevated turbidity levels during construction and possible reduction in autotrophic organisms normally associated with this condition, no reduction in dissolved gas levels are expected. Because of the nearshore water agitation caused by breaking waves, dissolved oxygen levels in the water column should not experience any significant reduction.

(h) Nutrients. The beach fill material consists primarily of a mixture of silica sand and shell. Because of the low silt content of the material, no increase in nutrient levels are expected.

(i) Eutrophication. Because of water exchanges from tides and currents, no significant buildup of macronutrients in the project area is expected. Therefore, there will be no change in the trophic status of the nearshore waters.

(2) Current Patterns and Circulation.

(a) Current Patterns and Flow. The most significant ocean current that exists off the east coast of Florida is the Gulf Stream. With the exception of intermittent local reversals, its flow is northward. The average annual current velocity is approximately 28 miles (45km) per day, about 17 miles (27 km) per day in November and about 37 miles (59km) per day in July. In the study area, offshore and longshore transport of materials are also seasonal in nature. In the winter, the southward littoral movement is the dominant direction of the longshore current.

(b) Velocity. Based on 1985 data, the average wave period that strikes the shoreline in the project area is about 6.7 seconds. The project would have no adverse impact. The wind generated waves and currents are the primary causes of losses of sand from the beaches, and cause most of the shoreline damage in the project area.

(c) Stratification. Because of the dynamic oceanographic conditions and currents originating from the St. Marys Inlet, it is highly unlikely that thermal or haline stratification ever exists. The project would have no adverse impact.

(d) Hydrologic Regime. The project would have no adverse impact.

(3) Normal Water Level Fluctuations. The project would have no adverse impact. The beach fill and widened beach will provide protection from storm waves and tides.

(4) Salinity Gradients. Because of constant water exchange from tidal and wind generated forces, salinity in the project area is at open ocean levels. The project would have no impact.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. There will be a temporary increase in turbidity levels seaward of the project area during construction. This short-term increase may have an adverse impact on nonmotile autotrophic as well as infaunal and sessile organisms such as periphyton, drifting phytoplankton, and mollusks. This elevated turbidity level will be temporary and isn't expected to be significant as state standards for turbidity will not be exceeded.

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

(a) Light Penetration. The placement of fill material will reduce light transmission in the littoral zone due to elevated levels of suspended particulates. Because of the density of the fill material, this adverse impact is expected to be temporary and short-term in nature.

(b) Dissolved Oxygen. Due to the low level of organic material in the borrow/fill material, anoxic layers of sediment exposed by dredging are anticipated to be minimal.

(c) Toxic Metals. Due to the clean nature of the calcareous borrow/fill material, toxic materials will not be introduced into the water column.

(d) Pathogens. No pathogenic material is expected to be involved with the project.

(e) Aesthetics. Aesthetic quality will be reduced during the beach construction period, but there will be a long term increase in the aesthetic quality of the project area once the eroded beach is restored.

(3) Effect on Biota.

(a) Primary Production/Photosynthesis. Elevated turbidity levels from resuspended beach fill may have an insignificant adverse impact on drifting autotrophic organisms in the immediate project level. It is anticipated that this will be a temporary and short-term phenomenon. Because of nearshore water exchange from tidal and wind generated currents, it is probable that photosynthetic organisms are continuously carried into and out of the project area. Therefore, no long term adverse impacts are expected.

(b) Suspension/Filter-Feeders. Beach fill material resuspended into the water column may contribute to the clogging of siphons of filter-feeders. This is expected to be a temporary and short-term condition. Because of high fecundity and turnover rates, rapid repopulation of these organisms is expected.

(c) Sight Feeders. Elevated turbidity levels will have a short-term adverse impact on these organisms. However, these organisms are highly motile and are able to migrate into more favorable areas to fulfill their nutritional requirements.

d. Contaminant Determinations. Deposited shell and calcareous fill material is similar to the existing beach material in the surrounding area and will not introduce, relocate or increase contaminants in nearshore waters.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. Decreased light transmission caused by suspended beach material may have a temporary adverse impact on plankton. However, this is expected to be short-term and insignificant. The Atlantic coast of Florida is highly dynamic in this particular area and resuspension of material is likely a natural phenomenon. Elevated turbidity levels will be a temporary condition and floating planktonic organisms may be removed from the project area via tides and currents.

(2) Effects on Benthos. Those benthic species not able to migrate from the project area will be covered. Because of the high fecundity and high turnover rate of benthic invertebrates, repopulation of benthic communities should occur within a few months once the construction has ceased.

(3) Effects on Nekton. Direct impacts to motile organisms will be insignificant because of their ability to avoid unacceptable conditions.

(4) Effects on Aquatic Food Web. Beach nourishment activities are likely to have a temporary and insignificant short-term impact on both structures and associated organisms seaward of the project area. Because the nonmotile organisms are quickly able to repopulate nourished intertidal zones, no long term adverse impacts to higher trophic level organisms are expected.

(5) Effects on Special Aquatic Sites. As the beach seeks equilibrium, resuspended sand will settle. However, the project area lies within highly dynamic oceanographic conditions where resuspended bottom material is not uncommon. The project would have no adverse impact.

(a) Sanctuaries and Refuges. Fort Clinch State Park occurs within the project area. The project would have no adverse impact on this facility.

(b) Wetlands. There are no intertidal marshes or submerged seagrasses seaward or adjacent to the project area.

(c) Vegetated Shallows. Because of the dynamic conditions common to the project area, no submerged aquatic vegetation exists seaward of the project area.

(d) Coral Reefs. These resources do not occur in the project area.

(6) Threatened and Endangered Species. In accordance with Section 7 of the Endangered Species Act, the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) have concurred that implementation of the proposed project would not adversely affect threatened or endangered species under their purview. Important safeguards to be implemented to assure that no adverse impacts from the project are experienced by threatened/endangered species is documented in Appendix C and Appendix D of this report.

(7) Other Wildlife. Renourishing the 4.3 mile section of the Atlantic shoreline in Nassau County is not expected to have a long term significant adverse impact on wading birds or

terrestrial foraging animals. These organisms are highly motile animals that are able to actively seek favorable environmental conditions for foraging and resting.

(8) Actions to Minimize Impacts. All practical safeguards will be taken during construction to preserve and enhance aesthetic, recreational, and economic values in the project area.

f. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. The fill material will not cause unacceptable changes in the mixing zone specified in the Water Quality Certificate in relation to: depth, current velocity and direction, variability, degree of turbulence, stratification, or ambient concentrations of constituents.

(2) Determination of Compliance with Applicable Water Quality Standards. Class III State water quality standards will not be violated outside of the established mixing zone.

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supply. No municipal or private water supplies will be impacted by the implementation of the project.

(b) Recreational and Commercial Fisheries. Finfish are highly motile animals and are well equipped to seek favorable environmental conditions elsewhere. Much of the physiochemical (temperature, salinity, depth) and geological oceanographic conditions (substrate characteristics) surrounding Amelia Island are very similar. No significant adverse impact to pelagic organisms is expected.

(c) Water Related Recreation. The placement of fill will generate a temporary inconvenience for those using the beach for recreational purposes. Once construction has ceased, water related recreation will be preserved as well as enhanced by the creation of additional beach area.

(d) Aesthetics. A temporary decrease in aesthetics will occur with the presence of earthmoving equipment. However, the stabilization of an eroding beach will only improve beachfront aesthetics.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. Fort Clinch State Park occurs within the project area. The project would have no adverse impact on this facility.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed discharge of material will have no cumulative negative impacts that would result in degradation of the natural, cultural, or recreational resources of the project area. The project will have no cumulative impacts that result in major impairment of water resources and will not interfere with the productivity and water quality of the existing aquatic ecosystem.

h. Determination of Secondary Effects on the Aquatic Ecosystem. No secondary effects are anticipated.

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

1. No significant adaptations of the guidelines were made relative to this evaluation.
2. In addition to considering the basic assumption of the "no action" alternative, several nonstructural and structural project alternatives were considered for adoption. Placing beach compatible material on an erosive beach satisfactorily meets the study objective and produces the most favorable net economic benefits for the project area. No practical alternative exists which meets the study objectives that does not involve discharge of beach compatible fill into waters of the United States.
3. The discharge of beach compatible fill material to be dispersed will not cause or contribute to violation of any applicable State water quality standards for Class III waters.
4. The discharge of mineral sand 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.
5. The placement of beach compatible fill material will not jeopardize the continued existence of any species listed as threatened or endangered as specified by the Endangered Species Act of 1973, as amended.
6. There will be no adverse impact on the water supply of the Nassau County from project implementation.
7. Direct (burial) and indirect (increased sedimentation) adverse impacts may be felt by nearshore (within 500

feet of the mean high water line). Non-motile sessile invertebrates may be buried by the beach fill and autotrophic and encrusting organisms may lose an attachment surface if any suitable structures are permanently buried. Hydrodynamic movements may redistribute offshore larvae of many of these organisms into the project area. Because of the high fecundity many of these organisms, repopulation and biodiversity is expected to rebound in the project area over time.

8. Short-term elevated turbidity is expected to return to background levels with the cessation of construction, it is anticipated that any impact overall will prove insignificant and temporary.
9. There will not be a direct adverse impact on highly motile organisms.
10. Non-motile infaunal organisms such as bivalve mollusks in the immediate project area will be buried by the beach fill but are expected to repopulate the area in a matter of months.
11. It is anticipated that there will be no significant or long term changes in biodiversity of the nearshore areas around Amelia Island from the implementation of this project.
12. The composition of the beach fill material obtained from the proposed offshore borrow site is such that it will not contribute organics or pollutants to the aquatic environment. Earthmoving equipment is not expected to operate in water (below mean low water) and this will minimize the likelihood that hydrocarbons from machinery will pollute the surrounding water. All necessary precautions will be taken to assure that no hazardous materials (oil, gas) are discharged from any construction equipment.
13. On the basis of the guidelines, the proposed disposal site for the discharge of fill material is specified as complying with the requirements of the Clean Water Act.

**APPENDIX B**

**COASTAL ZONE MANAGEMENT PROGRAM**

**FEDERAL CONSISTENCY EVALUATION PROCEDURES**

**Appendix B**

**Florida Coastal Zone Management Program  
Federal Consistency Evaluation Procedures**

**Nassau County Shore Protection Project**

**GENERAL RE-EVALUATION REPORT WITH  
ENVIRONMENTAL ASSESSMENT**

**Nassau County, Florida**

FLORIDA COASTAL ZONE MANAGEMENT PROGRAM  
FEDERAL CONSISTENCY EVALUATION PROCEDURES  
NASSAU COUNTY SHORE PROTECTION PROJECT  
GENERAL RE-EVALUATION REPORT WITH  
ENVIRONMENTAL ASSESSMENT  
NASSAU COUNTY, FLORIDA

1. Chapter 161, Beach and Shore Preservation.

The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and what might have an effect on natural shoreline processes.

Response: The primary purpose of this project is to provide shore protection. Consideration is given during the planning process to impacts upon natural coastal processes, activity and use criteria, natural vegetation, and adjacent property. Detailed analyses of each of these areas are presented in the 1985 Final Environmental Impact Statement (FEIS). The goals set forth in this chapter have been met through continuous consultation with appropriate Federal, State, and local agencies.

2. Chapters 186 and 187, State and Regional Planning.

These chapters establish the State Comprehensive Plan which 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: This proposed project has been coordinated with appropriate Federal, State, and local governmental agencies. The project meets the primary goal of the State Comprehensive Plan for beaches through preservation of a protective beach. As this project would increase recreational opportunities in the area, it is also considered advantageous to the local economy and would provide for economic growth.

3. Chapter 252, Disaster Preparation, Response and Mitigation.

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

Response: The proposed beach disposal will help protect the beach from further erosion and reduce potential damage resulting from storms to the property and roads adjacent to the Atlantic

coast at Nassau County Beach. Therefore, this project would be consistent with the efforts of the Division of Emergency Management.

#### 4. Chapter 253, State Lands.

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

Response: The proposed beach nourishment project would create a wider recreational beach and provide necessary storm protection for development and infrastructure along the Nassau County Beach. Motile forms such as fish and epifaunal crustaceans should experience insignificant short-term adverse impacts. The short-term adverse impact is likely to be felt primarily by the nonmotile infaunal invertebrates and sessile autotrophic organisms. Because of the high fecundity and high turnover rate of these organisms, it is not anticipated that a numerically significant loss of these communities would be a long-term condition. Previous benthic investigations have concluded that benthic communities normally recolonize the area seaward of a renourished beach within a matter of a few months. Historical and archeological resources will be addressed in Chapter 267, Historic Preservation. This project will therefore 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: The Nassau County Beach is in public ownership and the beach has numerous public access points from adjacent parking areas. Therefore, 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: Beach disposal would provide protection for the Fort Clinch State Recreational Area from storm generated wave energy

as well as have a positive influence on recreational opportunities in the park/beach area. The addition of beach compatible fill material would quickly be invaded by opportunistic grasses and other salt tolerant vegetation. This beach flora would add refuge and foraging areas for the small mammal and reptile inhabitants of the project area. The entire borrow area and portions of the SPP area north of State Route 200, Atlantic Boulevard, occur within the Fort Clinch State Aquatic Preserve (FCAP). Waters adjacent to the Preserve are designated by the State as Outstanding Florida Waters (OFWs) and, as such, receive Florida's highest protection under the State's water quality standards. All work to be done within the FCAP and OFWs, will strictly conform to provisions of the State water quality permit and will not diminish the Preserve's ecological integrity. Therefore, the project is consistent with the intent of this chapter.

#### 7. Chapter 267, Historic Preservation.

This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project and the results of the archival research and remote sensing survey have been coordinated with the Florida State Historic Preservation Officer (SHPO). Archeological diver investigations have been conducted to identify and evaluate 12 of the 22 magnetic and sonar targets identified in the proposed borrow areas. A plan for treatment of significant historic properties will be developed and coordinated with the SHPO. No historic properties are known to exist on the beach to be renourished. The SHPO is expected to concur with the Corps determination that the proposed project will not adversely affect any significant historic properties. The project will be consistent with the goals of this chapter.

#### 8. Chapter 288, Economic Development and Tourism.

This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed beach would better protect infrastructure and improve recreational potential at Nassau County Beach thus meeting the goals of this chapter.

#### 9. Chapters 334 and 339, Public Transportation.

This chapter authorizes the planning and development of a safe and efficient transportation system.

Response: No long-term adverse impacts to public transportation systems are anticipated by this project.

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 of research.

Response: Motile species such as fish and epifaunal crustaceans will be able to avoid the area during construction and seek favorable environmental conditions. Non-motile autotrophic organisms and infaunal invertebrates would be temporarily lost. As demonstrated from past scientific investigations concerning the recolonization success of the benthic communities seaward of nourished beaches, the loss of nonmotile invertebrates will be a short-term situation. Contract specifications will contain protective measures specifically designed to avoid adverse impacts to manatees and sea turtles which may be foraging in the area.

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 proposed beach disposal has been coordinated with the U.S. Fish and Wildlife Service and National Marine Fisheries Service for compliance under Section 7 of the Endangered Species Act. Both agencies have concurred with the Corps determination that populations of threatened/endangered species under their purview would not be adversely affected by the proposed action. Further explanation is provided by documents included in Appendix C (Fish and Wildlife Planning Report) and Appendix D (Pertinent Correspondence) of this report. There exists adjacent forested areas where small mammals and reptiles could actively seek temporary shelter during beach construction activities. Placement of sand on the beach will be quickly invaded by opportunistic grasses and beach vegetation. This new habitat will provide refuge and foraging opportunities for small species

and promote biodiversity in the project area. This project complies 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 groundwater or surface water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control.

This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: This project does not involve transportation of any toxic substances. All precautions will be taken during the construction phase to assure that no hydrocarbons or other toxins are expelled into the environment by dredging or earthmoving equipment.

14. Chapter 377, Oil and Gas Exploration and Production.

This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

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

15. Chapter 380, Environmental Land and Water Management.

This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development.

Response: Beach disposal on a 4.3 mile section of Nassau County Beach is unlikely to have any regional impact on resources found along the southeastern Atlantic coast of Florida. The project is consistent with the established goals of this chapter.

16. Chapter 388, Arthropod Control.

This chapter provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

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

17. Chapter 403, Environmental Control.

This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation.

Response: Air pollution problems are expected to be insignificant due to strong prevailing coastal winds, and only due to increased vehicular traffic during the construction phase. Water pollution is expected to be short-term resulting in minor turbidity increases. Monitoring for turbidity during beach nourishment will assure compliance with all applicable water quality standards. A project Water Quality Certificate (WQC) will be applied for during the Plans and Specification phase of planning. Complete adherence to WQC conditions will assure full compliance with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation.

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

Response: The project is not located near or on any agricultural lands. The proposed project is designed to restore and protect eroding public beach which offer both recreational opportunities as well as protection for both property and human health against storm generated wave energy.

**APPENDIX C**

**US FISH AND WILDLIFE SERVICE**

**COORDINATION ACT REPORT**

**AND**

**ENDANGERED SPECIES CONSULTATION with**

**US FISH AND WILDLIFE SERVICE AND**

**NOAA FISHERIES**



# United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive South

Suite 310

Jacksonville, Florida 32216-0958

IN REPLY REFER TO:  
FWS/R4/ES-JAFL

August 18, 2003

Mr. James C. Duck  
Chief, Planning Division  
Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232

Attn: Ms. Terri Jordan

FWS Log No: 03-1344

Dear Mr. Duck:

This document transmits the revised Fish and Wildlife Service's (Service) biological opinion based on our review of the reoccurring beach nourishment activities on Amelia Island, Nassau County, Florida and its effects on loggerhead, green and leatherback sea turtles, in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Your letter of July 1, 2003, requesting a revised biological opinion was received on July 2, 2003.

This biological opinion is based on information provided in the Service's Fish and Wildlife Coordination Act Report (CAR). A complete administrative record of this consultation is on file at Jacksonville Field Office

## CONSULTATION HISTORY

On November 5, 1997, the Service provided to the Corps a CAR, including a biological opinion on sea turtles, on the Corps Nassau County Shore Protection Project.

On July 1, 2003, the Corps requested an updated biological opinion for the above referenced project. It had been six years since the first opinion had been prepared, and changes have been made in the reasonable and prudent measures and terms and conditions.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

The Service has described the action area to include 4.3 miles of beach on Amelia Island, Nassau County, in which beach nourishment activities are reoccurring or proposed. The projects involve the beach nourishment of 3.6 miles of beach on Amelia Island, in addition to 0.7 mile of beach starting at the south jetty at the St. Marys River. The 0.7 mile reach will be for sand dredged from the entrance channel to the St. Marys River for the purpose of maintaining navigation for Kings Bay Naval Station. This same reach was also the subject of another biological opinion (June 16, 2003; FWS Log No. 03-1183). It is possible that sand may be placed on this reach twice a year. The time interval for the remaining 3.6 miles is once every five years, and sand will come from an off-shore borrow site.

### STATUS OF THE SPECIES/CRITICAL HABITAT

#### Species/critical habitat 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 Fish and Wildlife Conservation Commission, 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 Fish and Wildlife Conservation Commission, 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 1997).

#### 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).

#### 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 involving analysis of mitochondrial DNA has identified five different loggerhead subpopulations/nesting aggregations 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) Dry Tortugas, Florida, Subpopulation, (4) Northwest Florida Subpopulation occurring at Eglin Air Force Base and the beaches near Panama City; and (5) Yucatán Subpopulation occurring on the eastern Yucatán Peninsula, Mexico (Bowen 1994, 1995; Bowen *et al.* 1993; Encalada *et al.* 1998; Pearce 2001). These data indicate that gene flow between these five 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 Dry Tortugas, 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.* (1996) 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/critical habitat 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, 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, 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

##### Loggerhead Sea Turtle

The loggerhead sea turtle nesting and hatching season for northern Florida Atlantic beaches (includes Nassau through Volusia Counties) extends from April 15 through November 30. Incubation ranges from about 45 to 95 days.

Based on sea turtle nesting surveys, Nassau County recorded 61 loggerhead nests of which 51 nests were recorded on Amelia Island in 2002. There is no data as to the exact number of nests laid within the action area.

##### Green Sea Turtle

The green sea turtle nesting and hatching season for northern Florida Atlantic beaches (includes Nassau through Volusia Counties) extends from May 15 through November 15. Incubation ranges from about 45 to 75 days.

There was one recorded green turtle nest in Nassau County in 2002, but none recorded on Amelia Island.

#### Leatherback Sea Turtle

The leatherback sea turtle nesting and hatching season for northern Florida Atlantic beaches (include Nassau through Volusia Counties) extends from April 15 through September 30. Incubation ranges from about 55 to 75 days.

From 1993-2002, three leatherback nests have been documented in Nassau County, all on Amelia Island.

#### Factors affecting the species environment within the action area

Currently beach driving is permitted within the action area, which may have an adverse impact on nests, hatchlings and nesting turtles. The uplands have been heavily developed with attendant lights from the residences which may cause disorientation of hatchling and adult females. This segment of the beach is under continuous threat of erosion which will affect a nest if the nest is exposed.

### EFFECTS OF THE ACTION

#### Factors to be considered

#### 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.

#### 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 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 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).

### 1. Nest relocation

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 Fish and Wildlife Conservation Commission, 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 Fish and Wildlife Conservation Commission, unpublished data). A 1994 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 and the use of heavy machinery 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.

### 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 (Philibosian 1976; Mann 1977; Florida Fish and Wildlife Conservation Commission, 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.

#### Indirect Effects

Many of the direct effects of beach nourishment 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, and future sand migration.

##### 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 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 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). 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.

#### Species' response to a proposed action

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.

## 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, green and leatherback sea turtles, the environmental baseline for the action area, the effects of the proposed beach nourishment, and the cumulative effects, it is the Service's biological opinion that the beach nourishment project, as proposed, is not likely to jeopardize the continued existence of the loggerhead, green and leatherback sea turtles and is not likely to destroy or adversely modify designated critical habitat. No critical habitat has been designated for the loggerhead, green and leatherback sea turtles in the continental United States; therefore, none will be affected.

The proposed project will affect only 4.3 miles 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. Although a variety of factors, including some that cannot be controlled, can influence how a nourishment 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 4.3 miles of nesting beach habitat could be taken as a result of this proposed action. The take 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) 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.

Incidental take is anticipated for only the 4.3 miles of beach that have been identified for sand placement. 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) the renourishment project will modify the incubation substrate, beach slope, and sand compaction; and (4) 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 loggerhead, green and leatherback sea turtles.

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 to reduce the likelihood of impacting sea turtle nesting and hatching activities.
4. 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.
5. The applicant must ensure that contractors doing the beach nourishment work fully understand the sea turtle protection measures detailed in this incidental take statement.
6. During the sea turtle nesting season, construction equipment and pipes must be stored in a manner that will minimize impacts to sea turtles to the maximum extent practicable.

7. 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.

1. All fill material placed must be sand that is similar to a native beach in the vicinity of the site that has not been affected by prior renourishment activities. The fill material must be similar 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 #200 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 project occurs during the period from April 15 through November 30. Nesting surveys must be initiated 65 days prior to nourishment activities or by April 15, 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 construction 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 construction 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 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.

3. Immediately after completion of the beach nourishment project and prior to April 15 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 April 15. If the project is completed during the nesting season, tilling will not be performed in areas where nests have been left in place or relocated. 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 dry 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 immediately prior to April 15. 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 exceeding 500 psi are present randomly within the project area, tilling will not be required.

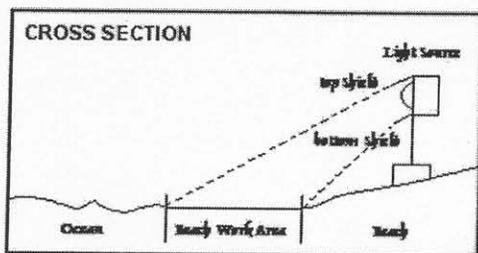
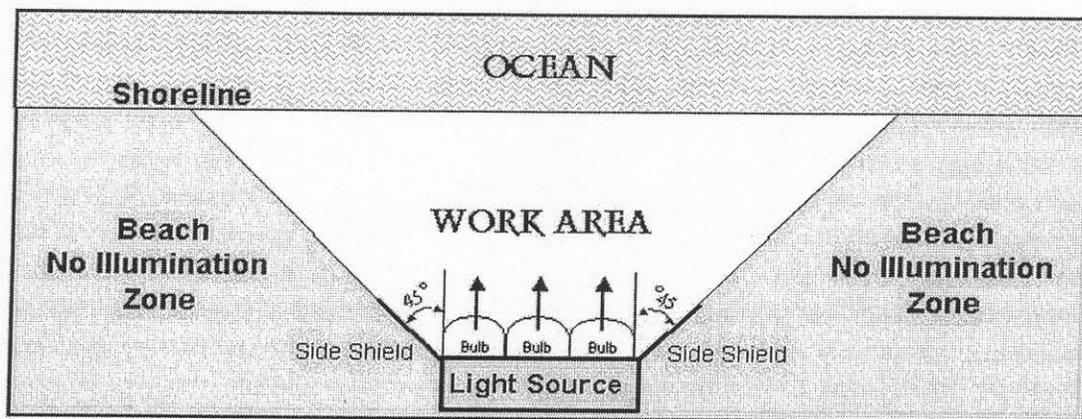
4. Visual surveys for escarpments along the project area must be made immediately after completion of the beach nourishment project and prior to April 15 for 3 subsequent years. Escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet must be leveled to the natural beach contour by April 15. If the project is completed during the sea turtle nesting and hatching season, escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. 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 beach.)

5. The applicant must arrange a meeting between representatives of the contractor, the Service, the Florida Fish and Wildlife Conservation Commission, 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.

6. From April 15 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).

7. From April 15 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 (see figure below).



**BEACH LIGHTING SCHEMATIC**

8. A report describing the actions taken to implement the terms and conditions of this incidental take statement must be submitted to the Jacksonville Field Office 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.
  
9. 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.
  
10. 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 Florida Fish and Wildlife Conservation Commission at 1-888-404-3922 and Jacksonville Field Office at 904-232-2580. 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.

The Service believes that incidental take will be limited to the 4.3 miles of beach that have been identified for sand placement. 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; (5) 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; (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 amount or extent of incidental take for sea turtles will be considered exceeded if the project results in more than twice-a-year for that 0.7 mile segment beginning at the south jetty of the St. Marys River, and once every five years for the remaining 3.6 miles of beach. 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 must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

#### CONSERVATION RECOMMENDATIONS

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

1. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.
2. Appropriate native salt-resistant dune vegetation should be established on the restored dunes. The Florida Department of Environmental Protection, Bureau of Beaches and Wetland Resources, 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. 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.

Sincerely,



for Peter M. Benjamin  
Assistant Field Supervisor

cc

Joe Johnston  
Robin Trindell-FWC

t/sec7&40/completed turtle Bos/Nassau Co. BO

## 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.
- Corliss, L.A., J.I. Richardson, C. Ryder, and R. Bell. 1989. The hawksbills of Jumby Bay, Antigua, West Indies. Pages 33-35 in Eckert, S.A., K.L. Eckert, and T.H. Richardson (compilers). Proceedings of the Ninth Annual Workshop on Sea Turtle Conservation and Biology. NOAA Technical Memorandum NMFS-SEFC-232.
- 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.
- LeBuff, C.R., Jr. 1990. The loggerhead turtle in the eastern Gulf of Mexico. Caretta Research, Inc.; Sanibel Island, Florida.
- 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. 1992. Hawksbill turtle *Eretmochelys imbricata*. Pages 95-99 in Moler, P.E. (editor). *Rare and Endangered Biota of Florida, Volume III*. University Press of Florida, Gainesville, Florida.
- 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.
- Meylan, A.B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata*) as critically endangered on the 1996 IUCN *Red List of Threatened Animals*. *Chelonian Conservation and Biology* 3(2):200-224.
- Meylan, A., B. Schroeder, and A. Mosier. 1995. Sea turtle nesting activity in the State of Florida 1979-1992. Florida Marine Research Publications Number 52, 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 Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery plan for hawksbill turtle (*Eretmochelys imbricata*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, Florida.

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, 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.
- 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.
- 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.
- Pearce, A.F. 2001. Contrasting population structure of the loggerhead turtle (*Caretta caretta*) using mitochondrial and nuclear DNA markers. M.S. thesis. University of Florida, Gainesville, Florida.
- Philibosian, 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.

Planning Division  
Environmental Branch

July 1, 2003

David Hankla  
Field Supervisor  
U.S. Fish and Wildlife Service  
Jacksonville Field Office  
6620 Southpoint Drive, South  
Suite 310  
Jacksonville, Florida 32216-0910

Dear Mr. Hankla:

This letter is written in response to a request made by Don Palmer, of your staff, in a June 13, 2003 email to Terri Jordan, of my staff.

On June 16, 2003, your office issued a new Biological Opinion (BO) for the Operations and Maintenance activities in the Kings Bay, Georgia/Fernandina Harbor, Florida. These maintenance activities often involve the placement of beach quality dredged material on Amelia Island, Florida beaches adjacent to the Kings Bay Entrance Channel (KBEC).

During the review of the new BO, FWS stated that they would like the Corps to request an "update" of the Nassau County Shore Protection Project (Nassau County SPP) BO issued by your office on November 5, 1997 to ensure consistency between the two opinions, since both of them will place dredge material on the beaches of Amelia Island, Nassau County, Florida. This letter formalizes the request from the Jacksonville District to your office for an update of the 1997 opinion issued by your office on the Nassau County Shore Protection Project to make it consistent with the new Kings Bay BO recently issued by your office.

Enclosed with this letter is a copy of the November 5, 1997 opinion. If you have any questions, please call Terri Jordan at 904-232-1817.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosures

Jordan/CESAJ-PD-EA/1817  
McAdams/CESAJ-PD-EA  
Mason/CESAJ-PD-E  
L.Perez/CESAJ-DP-C  
Strain/CESAJ-PD-P  
Duck/CESAJ-PD

L: group/pde/jordan/fws nassau letter



**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 (727) 570-5517

CHRON

AUG 10 2004

F/SER3:EGH

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

Dear Mr. Duck:

This responds to your June 29, 2004, letter and request for the National Marine Fisheries Service's (NOAA Fisheries) concurrence with your determinations regarding the Nassau County Beach Erosion Control Project (NCBECP), in Nassau County, Florida, pursuant to section 7 of the Endangered Species Act (ESA).

The project calls for 4.3 miles of beach restoration from the northern tip of Amelia Island at the Fort Clinch State Park and the St. Mary's River south jetty south to Sadler Road. Approximately 2.5 million cubic yards of sand will be mined from nearshore borrow areas and placed on the beach for initial construction, and 1.6 million cubic yards will be placed for renourishment on a five-year basis for 50 years.

The Army Corps of Engineers, Jacksonville District (COE-JAX) has determined that the proposed project will not affect leatherback sea turtles or whale species in the action area, but that the remaining sea turtles species could be affected since a hopper dredge is likely to be used for the sand mining operation. The COE-JAX has determined that the September 25, 1997, NMFS Regional Biological Opinion (RBO) on hopper dredging of southeast U.S. channels and borrow areas issued to the COE's South Atlantic Division (of which COE-JAX is part) applies to the proposed action. The COE-JAX intends to abide by the requirements of the RBO, or any new RBO which supersedes the latter. Any takes of federally-listed species resulting from the activity will be counted against the take limit established by the RBO.

The potential for take of sea turtles by hopper dredges has been well documented by NOAA Fisheries and the COE. Hopper dredges routinely take sea loggerhead, Kemp's ridley, and green sea turtles during maintenance dredging activities in federal navigation channels on the Atlantic Seaboard and the Gulf of Mexico. As well, it is documented by NOAA observers aboard hopper dredges that sturgeon are occasionally entrained, sometimes lethally. There are no known dredge takes of smalltooth sawfish and they are not believed to occur in the action area; therefore, this species will not be considered.



Ship strikes are one of the primary human-caused sources of mortality for endangered right and humpback whales. These species occasionally cross nearshore navigation channels, and have sometimes been observed by NOAA observers aboard hopper dredges. The potential exists for collisions between hopper dredges and migrating humpback or right whales which travel in nearshore waters, particularly during spring migrations. To date, no such collisions have been documented.

Given the commitment by COE-JAX to abide by the requirements of the RBO, NOAA Fisheries' Protected Resources Division (PRD) does not foresee any additional impacts of the dredging that have not already been considered and previously addressed in the RBO.

In addition to its protected species/critical habitat consultation requirements with NOAA Fisheries' PRD pursuant to section 7 of the ESA, prior to proceeding with the proposed action the COE-JAX must also consult with NOAA Fisheries' Habitat Conservation Division (HCD) pursuant to the Magnuson-Stevens Fishery Conservation and Management Act's requirements for essential fish habitat (EFH) consultation (16 U.S.C. 1855 (b)(2) and 50 CFR 600.905-.930, subpart K).

We appreciate the opportunity to comment on this project and work with the COE-JAX to help it fulfill its mandate under the ESA and ensure the protection of threatened and endangered species under NOAA Fisheries' purview. Please contact Mr. Eric Hawk, PRD, at 727/570-5312 if you have any questions or if we may be of assistance.

Sincerely,



David Bernhart  
Assistant Regional Administrator  
for Protected Resources

cc: F/PR3; F/SER4 - M.Croom  
I/SER/2004/00882  
File: 1514-22 f.1. FL

Planning Division  
Environmental Branch

JUN 29 2004

Mr. David Bernhart  
National Marine Fisheries Service  
Southeast Regional Office  
Protected Species Resources Division  
9721 Executive Center Drive North  
St. Petersburg, Florida 33702

Dear Mr. Bernhart:

The U.S. Army Corps of Engineers (Corps), Jacksonville District proposes to construct the Nassau County Beach Erosion Control Project (NCBECP) in Nassau County, Florida. The project calls for 4.3 miles of beach restoration from the northern tip of Amelia Island at the Fort Clinch State Park and the St. Mary's river south jetty south to Sadler Road. Approximately 2.5 million cubic yards of sand will be mined from nearshore borrow areas and placed on the beach for initial construction and 1.6 million cubic yards will be placed for renourishment on a five-year basis for fifty years. An Environmental Assessment for this project was completed and a Finding of No Significant Impact was signed on March 17, 1999.

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), Kemp's ridley sea turtle (*Lepidochelys kempii*, E), finback whale (*Balaenoptera physalus*, E), humpback whale (*Megaptera novaeangliae*, E), north Atlantic right whale (*Eubalaena glacialis*, E), sei whale (*Balaenoptera borealis*, E), and the sperm whale (*Physeter macrocephalus*, E).

The Corps has determined that the proposed construction of the NCBECP will have no effect on the leatherback sea turtle or whale species in the area. However, the proposed project may affect the remaining sea turtle species, since a hopper dredge is likely to be used for the sand mining operations. Based on

the September 25, 1997 biological opinion issued by NMFS to the South Atlantic Division of the Corps (of which Jacksonville is a member), the Corps will incorporate all terms and conditions from that opinion for any hopper dredging activities associated with the NCBECP. The Corps has determined that with the implementation of the terms and conditions from the September 1997 opinion, we may affect, but are not likely to adversely affect listed species under NMFS jurisdiction within the project area. If the 1997 Biological Opinion is updated and/or superceded in the future, the terms and conditions of the new biological opinion will be used for this project. We request your concurrence with our determination.

If you have any questions, please contact Ms. Terri Jordan at 904-232-1817 or [terri.l.jordan@saj02.usace.army.mil](mailto:terri.l.jordan@saj02.usace.army.mil).

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure

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

L: group/pde/jordan/Nassau SPP/Nassau County SPP Sect 7 letter  
NMFS.doc



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
6620 Southpoint Drive South  
Suite 310  
Jacksonville, Florida 32216-0912

IN REPLY REFER TO:  
FWS/R4/ES-JAFL

NOV 5 1997

A.J. Salem  
Chief, Planning Division  
U.S. Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

In accordance with the Transfer Fund Agreement between the Fish and Wildlife Service and the Jacksonville District Corps of Engineers, this letter transmits the Final Coordination Act Report and biological opinion on the proposed Nassau County Shore Protection Project, Florida.

For further coordination on this project, please contact Don Palmer in this office at (904) 232-2580, ext. 115.

Sincerely,

Michael M. Bentzien  
Assistant Field Supervisor

NASSAU COUNTY  
SHORE PROTECTION PROJECT

Fish and Wildlife  
Coordination Act Report



Submitted to:  
Department of the Army  
Jacksonville District Corps of Engineers  
Planning Division, Environmental Branch  
Jacksonville, Florida

Submitted by:  
Department of the Interior  
U. S. Fish and Wildlife Service  
Ecological Services  
Jacksonville, Florida

## TABLE OF CONTENTS

	Page
1.0 Background	1
2.0 Project Description	1
3.0 General Description of Project Area	2
4.0 Project Impacts	4
5.0 Biological Opinion	5
6.0 Coastal Barrier Resource Act Consultation	19
7.0 Literature Cited	20

## 1.0 Background

Nassau County, Florida's northernmost county on the east coast, is bounded on the east by Cumberland Sound, Amelia Island, and Nassau Sound. The approach leading into Cumberland Sound has been armored to the north and south by rock jetties. The southern jetty extends easterly from the northern tip of Amelia Island.

In 1946, the Shore Protection Board first described "erosion of portions of the ocean shore of Amelia Island and steepening of the offshore area" (Final Environmental Impact Statement, 1985). Subsequent studies determined that the source of this erosion was "primarily one of starvation of the beach ... caused by the littoral barrier created by the jetties" (Final Environmental Impact Statement, 1985). Storm-generated wave attacks were thought to contribute to the problem.

The Shore Protection Board reported its findings to the U. S. Army Corps of Engineers (Corps). Numerous options were evaluated and on April 24, 1984, A Feasibility Report with a Final Environmental Impact Statement (revised in March 1985) was prepared for the Nassau County Shore Protection Project. The project was authorized by the Water Resources Development Act of 1988 (P.L. 100-676).

## 2.0 Project Description

The original project called for beach restoration on Amelia Island, along 3.6 miles of eroded beach beginning 0.7 mile south of the south jetty south to Sadler Road, sand tightening about 1500 feet of the shoreward end of the south jetty, and periodic nourishment of 4.3 miles of shore which extends from the end of the south jetty to Sadler Road. Source of sand for beach restoration was the entrance channel of the St. Marys River.

The condition of the project shoreline which existed during preparation of the feasibility report has changed significantly since project authorization. The report was prepared prior to the deepening of the St. Marys Entrance Channel to minus 51 feet mean low water (MLW). The deepening of the channel has resulted in more frequent maintenance dredging, with material being deposited on segments of Amelia Island beach.

As a result of these changes, and in addition to the completion of the sand tightening project which was done during the initial channel deepening, the Corps is preparing a General Re-evaluation Report (GRR). The Corps intends to prepare a Supplement to the Environmental Impact Statement. The proposed modifications include, but are not limited to:

1. Modify the length of beach fill from 3.6 to 4.3 miles.
2. Using additional borrow areas as sand sources.

3. Eliminating sand tightening of the south jetty from the project.

On November 26, 1992, the Corps and Service met to discuss the GRR and to develop a Scope of Work for any additional information required. The Service approved a Scope of Work on March 3, 1993, and submitted a draft Coordination Act Report (CAR) to the Corps on July 26, 1993. At the Corps' request, the issuance of the final report was postpone until the Corps evaluated further modifications to the project. On September 25, 1997, the Corps requested the Service complete the final report, which would include additional modifications to the project. The intent of this report is to reaffirm and update the Service's original CAR submitted to the Corps on August 25, 1982, for the Feasibility Report.

The project has been modified by including work at Fort Clinch State Park. The work involves the construction of a new groin (groin 6) and connecting groins 4,5 and 6 with a rock revetment and backfilling behind the revetment on the north side of Fort Clinch. The original proposal called for the construction of a breakwater at the terminal ends of the three groins.

### 3.0 General Description of Project Area

The scope of the project involves three components:

1. 4.3 miles of supralittoral beach proposed for restoration (Figure 1).
2. The construction of a new groin, revetment and backfill at Fort Clinch State Park (Figure 2).
3. Proposed off-shore borrow sites (Figure 3).

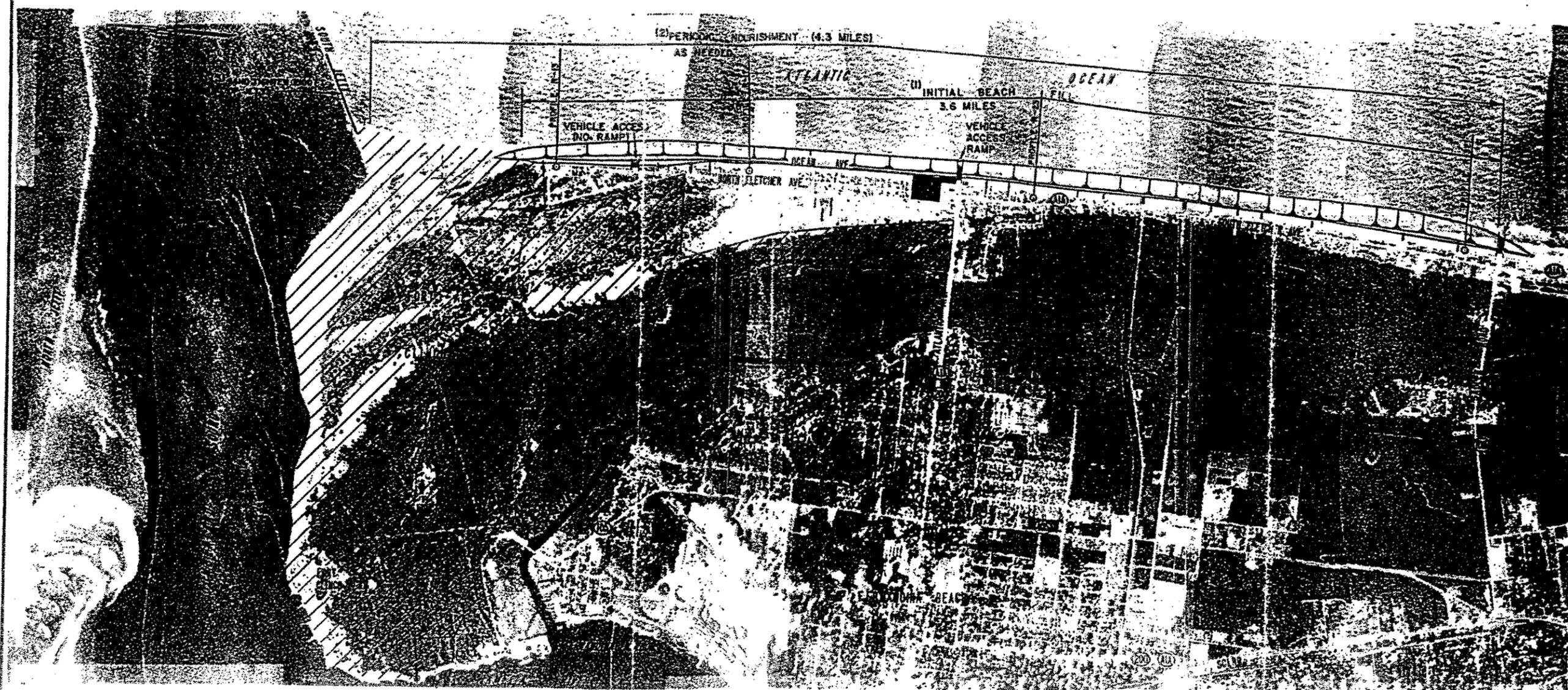
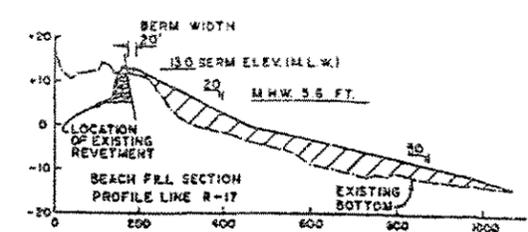
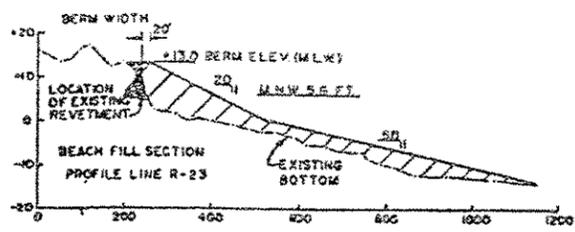
Each component is described below.

#### 3.1 Beach Zone

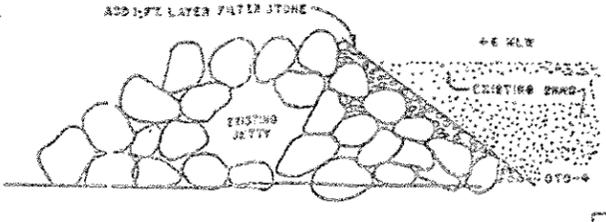
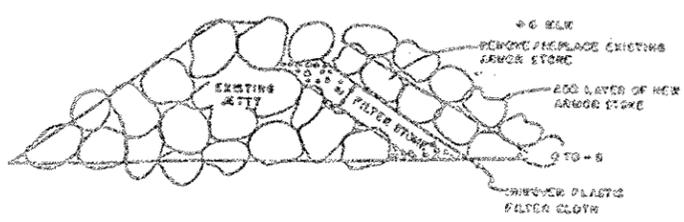
The intertidal beach zone and supralittoral beach occupy the entire length of the project area. These zones are variously composed of quartz sand and shell hash. On June 1, 1993, the Service conducted a site inspection at low tide. Based on the location of the wrack line, little beach remains at high tide. (The wrack line was characterized by cast floating gulfweed, *Sargassum* spp.). There was also recent evidence of dune erosion. An escarpment was evident during the site inspection, but it does not appear to be significant.

Systematic sampling was not done along the project site. However, sampling was done for the August 1982 CAR. We did not anticipate changes in species composition or abundance since no restoration work has been done along most of the shoreline within the project area.

FIGURE 1



SAND TIGHTENING PROVIDES FOR  
1. FILTER AND RAUOR STONE  
2. PLASTIC FILTER CLOTH



LEGEND

- PUBLIC ACCESS
- VEHICLE ACCESS
- CITY PARK
- PUBLIC ROAD FRONTING OCEAN
- INITIAL BEACH FILL
- TOP ELEVATION 13 FT MLW
- APPROXIMATE TOE OF FILL
- OCEANWARD SLOPE 1 ON 20 TO MHW TRENCH
- 1 ON 50 TO EXISTING BOTTOM

SCALE IN FEET  
0 500 1000 2000

BEACH EROSION CONTROL STUDY  
NASSAU COUNTY, FLORIDA  
**THE SELECTED PLAN  
AND PUBLIC ACCESS**  
DEPARTMENT OF THE ARMY  
JACKSONVILLE DISTRICT, CORPS OF ENGINEERS

FOR 1/4" INCH

EXISTING STRUCTURES

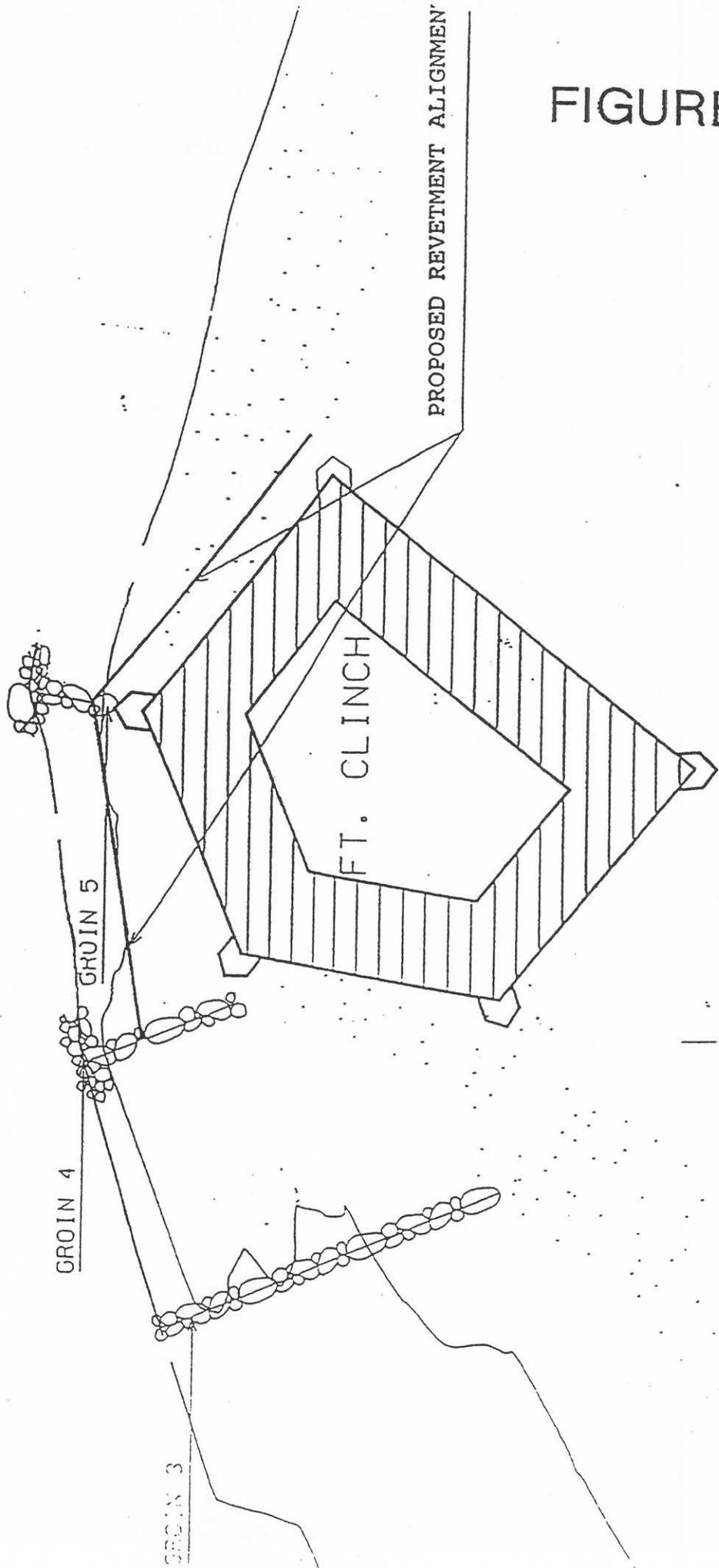
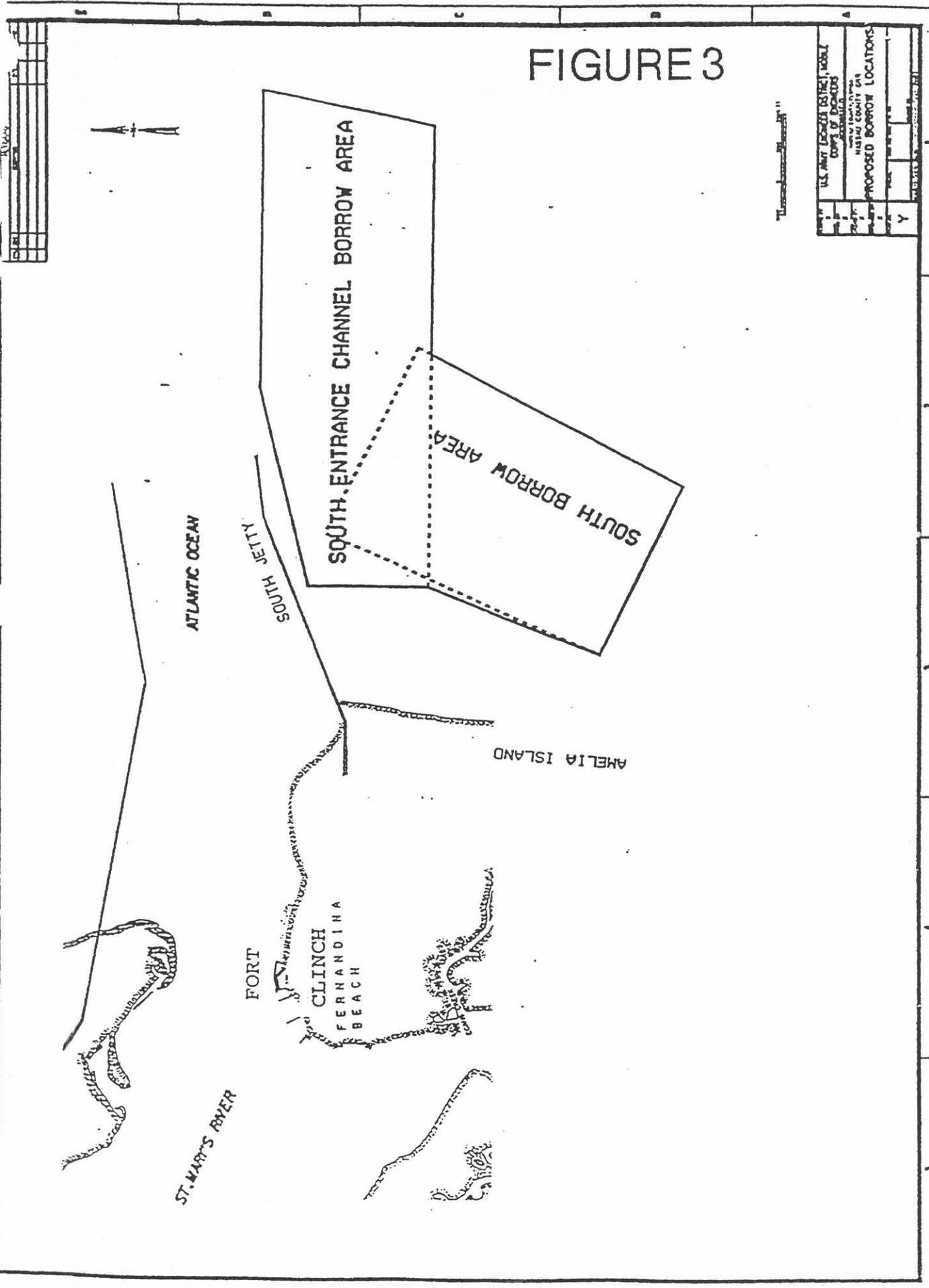


FIGURE 2

# FIGURE 3



U.S. Army Corps of Engineers	
District Office	
New York County Office	
PROPOSED BORROW LOCATIONS	
Y	

COPY OF DRAWING

ST. MARY'S RIVER

FORT

CLINCH  
FERNANDINA  
BEACH

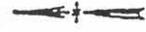
AMELIA ISLAND

ATLANTIC OCEAN

SOUTH JETTY

SOUTH ENTRANCE CHANNEL BORROW AREA

SOUTH BORROW AREA



Scale bar


The federally threatened loggerhead sea turtle (*Caretta caretta*) nests along this reach of beach. Both the green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) sea turtles may nest on this reach of beach from time to time. Use of this beach by nesting sea turtles is further described in the biological opinion in this report.

During the site inspection, shorebird diversity was low. Sandpipers (Scolopacidae) were observed using the exposed beach at low tide, brown pelicans (*Pelecanus occidentalis*) were observed offshore, and ring-billed gulls (*Larus delawarensis*) were seen adjacent to the site. The Florida Department of Environmental Protection (FDEP) has developed a management plan for Big Talbot Island State Park (Table 1). Because of the similarity of the shoreline conditions, we believe the species observed on Big Talbot Island will also be found within the project area from time to time.

Surf zone ichthyofauna include such species as silverside minnows (*Menidia* sp.), mullet (*Fundulus* sp.), anchovies (*Anchoa* sp.), croaker (*Micropogon undulatus*), and mullet (*Mullet* sp.). In contrast to these forage species, predator species such as red drum (*Sciaenops ocellata*), whiting (*Menticirrhus americanus*), spotted seatrout (*Cynoscion regalis*) and pompano (*Pomatomus saltatrix*) are also known from shallow waters along the beach.

Sandy beaches are populated by small, short-lived infauna with high species density and substantial reproductive potential and recruitment. These communities occur in relatively defined zones and depend to some extent on the nature of the substrate. Ruppert and Boyer (1988) indicate that 20-30 invertebrate species may be found in these systems, including decapod crustaceans, bivalves, spionid worms, and burrowing haustoriid amphipods.

These faunal communities have been described by FDEP, which has compiled a list of species known to occur on Big Talbot Island (Table 2) and in Johnson *et al.* (1971). See Table 1 to the project site's proximity to Big Talbot Island and to the sites described in Johnson (1971), we believe that these species are likely to be found within the project area from time to time.

A heavily impacted dune system can be found above mean high water. Except for a small portion of beach within Ft. Clinch State Park (approximately 0.7 mile), private homes and a utility line follow the upper reaches of the beach. Driving is no longer permitted along this beach, however. The system is intact and is typical of a low dune system. In some areas there is evidence that wave action has eroded the dune face. Along the dune, there is a mixture of sea oats (*Uniola paniculata*) and beach pennywort (*Hydrocotyle bonariensis*).

### 3.2 Borrow Sites

When the feasibility report was prepared, two borrow sites were proposed. Borrow Site A was located south of the south jetty; site B was located to the east of site A. The

dove on these two sites in 1982, and conducted random bottom sampling. Only two species were found, five-holed keyhole urchins (*Mellita quinquesperforata*) and calico box crabs (*Hepatus epheliticus*). No hard reef was found.

For this reevaluation, the Corps has proposed using two borrow sites (Figure 3). The borrow sites are located south of the south jetty. For this reevaluation, the Service did not repeat the bottom sampling.

Based on core borings conducted by the Corps, there are no rock formations in either borrow site, and there is approximately 10-20 feet of sand over the geologic formation. The Corps estimates that about 1.5-1.7 million cubic yards of material will be removed from these sites.

### 3.3 Fort Clinch

The shoreline in front of Fort Clinch is the south side of the St. Marys Channel. This shoreline is experiencing erosion and is inundated during high tides, as evidenced by wrack lines up close to the fort. There is concern that continued erosion will place the fort in jeopardy. There are exposed pieces of the old breakwater constructed of tabby and capped with brick found scattered along the beach in front of the fort.

We believe similar invertebrate species, as described in section 3.1, are likely to be found in this area. There are no recorded turtle nests along this reach of beach within the St. Marys Channel.

## 4.0 Project Impacts

### 4.1 Beach Zone

The placement of clean sand on the beach will result in significant mortality of benthic organisms. This high mortality will be temporary as the benthic animals have a high reproductive and recruitment potential. Continental Shelf Associates, Inc. (1989) report that benthic fauna may recover from beach "filling" within a year.

While sand is being pumped on the beach, birds are known to feed on benthic organisms found within the dredged material. After this initial pulse of prey, there will be a period of time in which the beach will probably be sterile. This should be temporary. Benthic organisms adjacent to the restored beach will repopulate the affected area quickly. Fish may temporarily vacate the surf proximal to the nourishment activity if turbidity becomes too great.

The effects of beach nourishment on nesting sea turtles and recommendations to minimize impacts are provided in the biological opinion section of this report.

## 4.2 Borrow Sites

The primary impact of sand removal from the two borrow sites is the immediate mortality of benthic organisms. Should the resultant depressions fill with sediment similar to that of the original matrix, these species will likely reestablish within a relatively short period of time. If the depressions fill with fine sediment, benthic faunal recolonization may be precluded.

Motile species, such as fish, may move out of the area. Some fish may initially die during sand removal. Fine sediment generated by this activity may kill fish by suffocation. When sand removal is complete, fish would be expected to return within a relatively short period of time.

The federally endangered manatee is found in the St. Marys River and along the coastline. A detailed discussion of this species and recommendations to protect it are found in the biological opinion section of this report.

## 4.3 Fort Clinch

The construction of the sixth groin, revetment and backfill behind the revetment will have similar effects on the beach habitat as described in section 4.1. However, the rock substrate will provide additional habitat for invertebrates such as crabs and bivalves.

## 5.0 Biological Opinion

On March 12, 1993, the Service provided the Corps with a list of threatened and endangered species that may be found within the area of influence of this project. The list included loggerhead and leatherback sea turtles, woodstorks (*Mycteria americana*), the piping plover (*Charadrius melodus*), and the manatee (*Trichechus manatus*). The green sea turtle (*Chelonia mydas*) was inadvertently omitted from this list. This opinion addresses the impact of excavating the material from the borrow sites and placing the clean sand on 4.3 miles of beach, beginning immediately south of the south jetty south to Sadler Road, and the proposed work at Fort Clinch.

### 5.1 Woodstorks

Woodstorks are frequently observed in Nassau County; however, the project will not impact feeding sites for this species. Feeding sites consist of swamps, ponds, lakes and ditches that have fluctuating water levels. All of the work is confined to the open water marine environment and adjacent shoreline. The Service, therefore, believes this project is not likely to adversely affect this species.

## 5.2 Piping Plover

The piping plover does not nest in Florida, but is found along both coasts in winter. The closest known wintering beach is Huguenot Memorial Park in Duval County. There are no known sightings of this species within the proposed project area. The Service, therefore, believes this project is not likely to adversely affect the piping plover.

## 5.3 Manatee

Manatees are frequently observed in the waterways throughout Nassau County. Manatees are considered year round residents of the county; however, sightings are more frequent during the warmer months. During the winter period, manatees are seen using the warm water discharge at Container Corporation's outfall pipe. During low tide, the animals leave the warm water discharge and use the warm water discharge at Gilman Paper Company's outfall pipe on North River, a tributary to the St. Marys River.

Watercraft collisions with manatees are the leading cause of human-related manatee mortality, approximately 80 percent, in Florida. Approximately 25-28 percent of all mortality is attributable to watercraft collisions. The Service's primary concern is boat traffic carrying construction personnel to the barges working over the borrow sites. There is no information as to where the work boats will be departing. Work boats moving at high speed in the Amelia River and through the St. Marys River Channel may strike a manatee. It is also possible that manatees may be found along the coastline, within the area of the proposed borrow sites.

The Service, FDEP, and the Corps have developed construction precautions to protect manatees from watercraft collisions. The Service recommends these conditions be included in the contract. Based on our review, it is the Service's biological opinion this project is not likely to adversely affect the manatee.

## Loggerhead and Green Sea Turtles

### Status of the species

The U.S. Fish and Wildlife Service has responsibility for regulating sea turtles when they come ashore to nest. The National Marine Fisheries Service has jurisdiction over sea turtles in the marine environment. In applying the jeopardy standard under the Endangered Species Act (ESA), the Fish and Wildlife Service has determined that sea turtle species occurring in the U.S. represent populations that qualify for separate consideration under section 7. Therefore, even though sea turtles are wide ranging and have distributions outside the U.S., the Service only considers the U.S. populations of sea turtles when making jeopardy or no jeopardy determinations under section 7 of the ESA.

The reproductive strategy of sea turtles involves producing large numbers of offspring to compensate for the high natural mortality through their first several years of life. However, for at

least two decades, several human-caused mortality factors have contributed to the decline of sea turtle populations along the Atlantic coast and in the Gulf of Mexico (National Research Council 1990a). These factors include commercial overutilization of eggs and turtles, incidental catches in commercial fishing operations, degradation of nesting habitat by coastal development, and marine pollution and debris. Therefore, human activities that affect the behavior and/or survivability of turtles on their remaining nesting beaches, particularly the few remaining high density nesting beaches, could seriously reduce our ability to conserve sea turtles.

### 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). 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).

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).

Recent genetic analyses using restriction fragment analysis and direct sequencing of mitochondrial DNA (mtDNA) have been employed to resolve management units among loggerhead nesting cohorts of the southeastern U.S. (Bowen *et al.* 1993; B.W. Bowen, University of Florida, Gainesville, in litt., November 17, 1994, and October 26, 1995). Assays of nest samples from North Carolina to the Florida Panhandle have identified three genetically distinct nesting populations: (1) northern nesting population - Hatteras, North Carolina, to Cape Canaveral, Florida; (2) South Florida nesting population - Cape Canaveral to Naples, Florida; and (3) Florida Panhandle nesting population - Eglin Air Force Base and the beaches around Panama City, Florida. These data indicate that gene flow between the three 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 population (Bowen *et al.* 1993, B.W. Bowen, University of Florida, Gainesville, in litt., October 26, 1995). Therefore, impacts on loggerheads in the northern nesting population,

in particular, become more significant because of the smaller total population, as well as observed population declines in Georgia and South Carolina (Frazer 1983, 1986; J. Richardson, pers. comm. cited in Dodd and Byles 1991; National Marine Fisheries Service and U.S. Fish and Wildlife Service 1991b).

#### Green Sea Turtle

The green sea turtle (*Chelonia mydas*) was listed under the ESA 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, unpubl. data). Green turtles have been known to nest in Georgia, but only on rare occasions (Georgia Department of Natural Resources, unpubl. data). The green turtle also nests sporadically in North Carolina (North Carolina Wildlife Resources Commission, unpubl. data). The first documentation of green turtle nests in South Carolina were reported in 1996 (S. Murphy, South Carolina Department of Natural Resources, pers. comm., 1996). Unconfirmed nesting of green turtles in Alabama has also been reported (R. Dailey, Bon Secour National Wildlife Refuge, pers. comm., 1995).

#### Environmental baseline

Status of the species:

#### Loggerhead Sea Turtle

The loggerhead sea turtle nesting and hatching season for Northern Florida Atlantic beaches (includes Nassau through Volusia Counties) extends from April 15 through November 20. Incubation ranges from about 45 to 95 days.

In Nassau County, turtle nest surveys are conducted by volunteers and by state biologists (Fort Clinch State Park is surveyed by state biologists). Within the project area outside of the state park (3.7 miles), from 1994 through September 1997, 23 nests/mile were recorded. Fort Clinch State Park recorded 3.7 nests/km along the remaining 0.7 mile of beach. No nest were recorded within the St. Marys Channel.

## Green Sea Turtle

The green sea turtle nesting and hatching season for Northern Florida Atlantic beaches (includes Nassau through Volusia Counties) extends from May 15 through November 15. Incubation ranges from about 45 to 75 days. No green turtle nests have been recorded on Amelia Island.

### Effects of the action:

#### *Direct effects*

Placement of sand on an eroded section of beach or an existing 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 construction. Nourishment during the nesting season, particularly on or near high density nesting beaches, can cause increased loss of offspring from human-caused mortality 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 would reduce these impacts, nests may be inadvertently missed 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 missed by experienced sea turtle nest surveyors (Schroeder 1994).

#### 1. Nest relocation

Besides the potential for missing nests during a nest relocation program, there is a potential for eggs to be damaged by their movement or for unknown biological mechanisms to be affected. 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, unpubl. 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, unpubl. 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) (A. Meylan, Florida Department of Environmental Protection, in litt., April 5, 1995).

A final concern about nest relocation is that it may concentrate eggs in an area resulting in a greater susceptibility 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.

## 2. Equipment

The placement of pipelines and the use of heavy machinery 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.

## 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 accretion of sand, others may remain hard for 10 years or more.

These impacts can be minimized by using suitable sand and by tilling the beach after nourishment if the sand becomes compacted. 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 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 beach compaction monitoring and, if necessary, tilling to ensure that project impacts on sea turtles are minimized. A root rake with tines at least 42 inches long and less than 36 inches apart pulled through the sand is recommended for compacted beaches. Service policy calls for beaches to be tilled if compaction levels exceed 500 psi.

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. Escarpments

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). These escarpments can hamper or prevent access to nesting sites. 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. Artificial lighting

Another impact to sea turtles is disorientation (loss of bearings) and misorientation (incorrect orientation) of hatchlings from artificial lighting. Visual cues are the primary sea-finding mechanism for hatchlings (Mrosovsky and Carr 1967, Mrosovsky and Shettleworth 1968, Dickerson and Nelson 1989, Witherington and Bjorndal 1991). Artificial beachfront lighting is a well documented cause of hatchling disorientation and misorientation on nesting beaches (Philbosian 1976; Mann 1977; Florida Department of Environmental Protection, unpubl. data). In addition, research has also documented significant reduction in sea turtle nesting activity 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, disorient females trying to return to the surf after a nesting event, and disorient and misorient 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.

### *Indirect effects*

Future erosion of nesting beaches is a potential indirect effect of nourishment projects on sea turtles. Dredging of sand offshore from a project area has the potential to cause erosion of the newly created beach or other areas on the same or adjacent beaches by creating a sand sink. The remainder of the system responds to this sand sink by providing sand from the beach to attempt to reestablish equilibrium (National Research Council 1990b).

### Cumulative effects:

Cumulative effects include the effects of future State, 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 ESA.

The Service is not aware of any cumulative effects in the project area.

### Conclusion:

After reviewing the current status of the, the environmental baseline for the action area, the effects of the proposed beach nourishment, and the cumulative effects, it is the Service's biological opinion that the beach nourishment project, as proposed, is not likely to jeopardize the continued existence of the and is not likely to destroy or adversely modify designated critical habitat. No critical habitat has been designated these turtles in Florida, therefore, none will be affected.

## INCIDENTAL TAKE STATEMENT

Sections 4(d) and 9 of the ESA, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as 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 any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. 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 a prohibited taking 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 agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order 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 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, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

#### Amount or extent of incidental take

The Service has reviewed the biological information and other information relevant to this action. Based on this review, incidental take is anticipated for all sea turtle 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. Incidental take is also anticipated for all sea turtle 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.

#### 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 or 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 .

1. Only beach quality sand suitable for sea turtle nesting, successful incubation, and hatchling emergence shall 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 shall be conducted. If nests are constructed in the area of beach nourishment, the eggs shall be relocated.
3. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, beach compaction shall be monitored and tilling shall be conducted as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.
4. Immediately after completion of the beach nourishment project and prior to the next three nesting seasons, monitoring shall be conducted to determine if escarpments are present and escarpments shall be leveled as required to reduce the likelihood of impacting sea turtle nesting and hatching activities.

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

#### Terms and conditions

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

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than those sea turtle nests and eggs that may be missed by a nest survey and egg relocation program, or those laid during the period when an egg relocation program is not required, will be incidentally taken. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Federal agency 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.

1. All fill material placed shall be sand that is similar to that already existing at the beach site in both coloration and grain size distribution. All such fill material shall be free of construction debris, rocks, or other foreign matter and shall generally not contain, on average, greater than 10 percent fines (i.e., silt and clay) (passing the #200 sieve) and shall 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 shall be required if any portion of the beach nourishment project occurs during the period from April 15 through November 30. Nesting surveys shall be initiated 65 days prior to nourishment activities or by April 15, whichever is later. Nesting surveys shall 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 construction activities, eggs shall be relocated per the following requirements.
  - 2a. Nest surveys and egg relocations shall only be conducted by personnel with prior experience and training in nest survey and egg relocation procedures. Surveyors shall have a valid Florida Department of Environmental Protection

permit. Nest surveys shall be conducted daily between sunrise and 9 a.m. Surveys shall be performed in such a manner so as to ensure that construction activity does not occur in any location prior to completion of the necessary sea turtle protection measures.

2b. Only those 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. Any nests left in the active construction zone shall be clearly marked, and all mechanical equipment shall avoid nests by at least 10 feet.

3. Immediately after completion of the beach nourishment project and prior to April 15 for three subsequent years, sand compaction shall 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 shall be followed. If required, the area shall be tilled to a depth of 36 inches. All tilling activity must be completed prior to April 15. If the project is completed during the nesting season, tilling shall not be performed in areas where nests have been left in place or relocated. A report on the results of compaction monitoring shall be submitted to the Service prior to any tilling actions being taken. An annual summary of compaction surveys and the actions taken shall be submitted to the Service. This condition shall be evaluated annually and may be modified if necessary to address sand compaction problems identified during the previous year.

3a. 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); one station shall be midway between the dune line and the high water line (normal wrack line); and one station shall be located just landward of the high water line.

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 27 values for each transect line, and the final 9 averaged compaction values.

3b. If the average value for any depth exceeds 500 psi for any two or more adjacent stations, then that area shall be tilled immediately prior to April 15. 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 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.

4. Visual surveys for escarpments along the project area shall be made immediately after completion of the beach nourishment project and prior to April 15 for 3 subsequent years. Results of the surveys shall be submitted to the Service prior to any action being taken. 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. If the project is completed during the sea turtle nesting and hatching season, escarpments may be required to be leveled immediately, while protecting nests that have been relocated or left in place. The Service shall be contacted immediately if subsequent reformation of escarpments that interfere with sea turtle nesting or that exceed 18 inches in height for a distance of 100 feet occurs during the nesting and hatching season to determine the appropriate action to be taken. If it is determined that escarpment leveling is required during the nesting or hatching season, the Service will provide a brief written authorization that describes methods to be used to reduce the likelihood of impacting existing nests. An annual summary of escarpment surveys and actions taken shall be submitted to the Service.

5. The applicant shall arrange a meeting between representatives of the contractor, the Service, the Florida Department of Environmental Protection 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. The meeting will provide an opportunity for explanation and/or clarification of the sea turtle protection action measures.

6. From April 15 through November 30, staging areas for construction equipment shall be located off the beach to the maximum extent practicable. Nighttime storage of construction equipment not in use shall be off the beach to minimize disturbance to sea turtle nesting and hatching activities. In addition, all construction pipes that are placed on the beach shall be located as far landward as possible without compromising the integrity of the existing or reconstructed dune system. Temporary storage of pipes shall be off the beach to the maximum extent possible. Temporary storage of pipes on the beach shall be in such a manner so as to impact the least amount of nesting habitat and shall likewise not compromise the integrity of the dune systems (placement of pipes perpendicular to the shoreline is recommended as the method of storage).

7. From April 15 through November 30, all on-beach lighting associated with the project shall be limited to the immediate area of active construction only. Such lighting shall be shielded low pressure sodium vapor lights to minimize illumination of the nesting beach and nearshore waters. Red filters should be placed over vehicle headlights (i.e., bulldozers, front-end loaders). Lighting on offshore equipment shall be similarly minimized through reduction, shielding, lowering, and appropriate placement of lights to avoid excessive illumination of the water, while meeting all U.S. Coast Guard and OSHA requirements. Shielded low pressure sodium vapor lights are highly recommended for lights on offshore equipment that cannot be eliminated.

8. A report describing the actions taken to implement the terms and conditions of this incidental take statement shall be submitted to the Jacksonville Field Office 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.

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

10. Upon locating a dead, injured, or sick endangered or threatened sea turtle specimen, initial notification must be made to Mr. Joe Oliveros located in the Jacksonville Field Office at 904-232-2580 ext. 113. 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.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. With implementation of these measures, the Service believes that no more than those sea turtle nests and eggs that may be missed by a nest survey and egg relocation program, or those laid during the period when an egg relocation program is not required, will be incidentally taken. If, during the course of the action, this minimized level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Federal agency 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 ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Construction activities for this project and similar future projects should be planned to take place outside the main part of the sea turtle nesting and hatching season.
2. Appropriate native salt-resistant dune vegetation should be established on the restored dunes. The Florida Department of Environmental Protection, Bureau 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 of 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. 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.

## 6.0 Coastal Barrier Resources Act

Fort Clinch State Park, which includes a 0.7 mile segment of the beach restoration project is within a designated Coastal Barrier Resource Unit, FL-01P. This unit, however, is designated as "otherwise protected areas". Consultation, in accordance with section 6 of the Coastal Barrier Resource Act of 1982, as amended, is, therefore, not required for this project.

## LITERATURE CITED

- Ackerman, R.A. 1980. Physiological and ecological aspects of gas exchange by sea turtle eggs. *Amer. Zool.* 20:575-583.
- 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. *Cons. Biol.* 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, MS.
- Continental Shelf Associates, Inc. 1989. Environmental impact assessment for beach restoration. Brevard County, Florida. Jupiter, Florida. 64 pp.
- 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. and R. Byles. 1991. The status of the loggerhead, *Caretta caretta*; Kemp's ridley, *Lepidochelys kempii*; and green, *Chelonia mydas*, sea turtles in U.S. waters: a reconsideration. *Marine Fisheries Review* 53(3):30-31.
- 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 (eds.). Proceedings of the 2nd Western Atlantic Turtle Symposium. NOAA Technical Memorandum NMFS-SEFC-226.
- Feasibility Report With Environmental Impact Statement for Beach Erosion Control. Nassau County, Florida (Amelia Island). 1985. U. S. Army Corps of Engineers, Jacksonville District.
- Fletemeyer, J. 1980. Sea turtle monitoring project. Unpubl. report to Broward County Environmental Quality Control Board, FL. 88pp.
- Florida Department of Natural Resources. Div. of Recreation and Parks. Reg. 2. 1991. Checklist of avian species occurring on Little Talbot Island, Big Talbot Island, Amelia Island, and Fort George Island. 2 pp.
- Florida Department of Natural Resources. Division of Recreation and Parks. Region 2 Administration. 1991. Checklist of bivalves. 1 p.

- Florida Department of Natural Resources. Florida Marine Research Institute. 1992. 1992 Florida Index Nesting Beach survey Data. 2 pp.
- Florida Resources and Environmental Analysis Center. 1984. Florida aquatic habitat and fishery resources. Storter Printing Company, Inc. Gainesville. 543 pp.
- Frazer, N.B. 1983. Survivorship of adult female loggerhead sea turtles, *Caretta caretta*, nesting on Little Cumberland Island, Georgia, USA. *Herpetologica* 39:436-447.
- Frazer, N.B. 1986. Survival from egg to adulthood in a declining population of loggerhead turtles *Caretta caretta*. *Herpetologica* 42(1):47-55.
- Fritts, T. H. and R. P. Reynolds. 1981. Pilot study of the marine mammals, birds, and turtles in OCS areas of the Gulf of Mexico. U. S. Dept. of the Interior. Bur. Land Management. Biol. Svcs. Prog. FWS/OBS-81/36. 140 pp.
- Gilmore, R. G., L. Bullock, and F. H. Berry. 1981. Fishes of the Indian River Lagoon and adjacent waters, Florida. Harbor Branch Foundation, Inc. Technical Report 41. 64 pp.
- Hopkins, S.R. and J.I. Richardson, eds. 1984. Recovery plan for marine turtles. National Marine Fisheries Service, St. Petersburg, FL. 355pp.
- Johnson, A. F. and J. W. Muller. 1993. An assessment of Florida's remaining coastal upland natural communities: northeast Florida. Florida Natural Areas Inventory. Tallahassee. 8 pp.
- Johnson, A. S. H. O. Hillestad, S. A. Fanning, and G. F. Shanholtzer. 1971. An ecological survey of the coastal region of Georgia: A report to the National Park Service. Univ. Georgia, Athens. 254 pp.
- Kaplan, E. H. 1988. A field guide to southeastern and Caribbean seashores; Cape Hatteras to the Gulf Coast, Florida, and the Caribbean. Houghton Mifflin Company. Boston. 425 pp.
- LeBuff, C.R., Jr. 1990. The loggerhead turtle in the eastern Gulf of Mexico. Caretta Research, Inc., Sanibel Island, FL. 236pp.
- Limpus, C.J., V. Baker, and J.D. Miller. 1979. Movement induced mortality of loggerhead eggs. *Herpetologica* 35(4):335-338.
- Mahadevan, S., J. Sprinkel, D. Heatwole, and D. H. Wooding. 1984. Bibliography of benthic studies in the coastal and estuarine areas of Florida. Florida Sea Grant Proj. No. IR-79-10. Rep. No. 66. 576 pp.

- Mann, T.M. 1977. Impact of developed coastline on nesting and hatchling sea turtles in southeastern Florida. Unpubl. M.S. thesis. Florida Atlantic University, Boca Raton, FL. 100pp.
- McGehee, M.A. 1990. Effects of moisture on eggs and hatchlings of loggerhead sea turtles (*Caretta caretta*). *Herpetologica* 46(3):251-258.
- Meadows, P. S. and J. I. Campbell. 1978. An introduction to marine science. John Wiley and Sons. New York. 176 pp.
- Meylan, A. 1992. Hawksbill turtle *Eretmochelys imbricata*. Pages 95-99 in Moler, P.E. (ed.). Rare and Endangered Biota of Florida, Volume III. University Press of Florida, Gainesville, FL.
- Meylan, A., B. Schroeder, and A. Mosier. 1995. Sea turtle nesting activity in the State of Florida 1979-1992. Florida Marine Research Publications Number 52, St. Petersburg, FL. 51pp.
- Miller, K., G.C. Packard, and M.J. Packard. 1987. Hydric conditions during incubation influence locomotor performance of hatchling snapping turtles. *J. Exp. Biol.* 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.
- 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. 52pp.
- 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. 64pp.
- 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. 65pp.
- National Marine Fisheries Service and U.S. Fish and Wildlife Service. 1993. Recovery plan for hawksbill turtle (*Eretmochelys imbricata*) in the U.S. Caribbean, Atlantic, and Gulf of Mexico. National Marine Fisheries Service, St. Petersburg, FL. 52pp.

- National Research Council. 1990a. Decline of the sea turtles: causes and prevention. National Academy Press, Washington, D.C. 259pp.
- National Research Council. 1990b. Managing coastal erosion. National Academy Press, Washington, D.C. 182pp.
- Nelson, D.A. 1987. The use of tilling to soften nourished beach sand consistency for nest turtles. Unpubl. report. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. 15pp.
- Nelson, D.A. 1988. Life history and environmental requirements of loggerhead turtles. U.S. Army Corps of Engineers Wildlife Service Biological Report 88(23). U.S. Army Corps of Engineers TR EL (Rev.). 34pp.
- Nelson, D.A. and D.D. Dickerson. 1987. Correlation of loggerhead turtle nest digging and beach sand consistency. Abstract of the 7th Annual Workshop on Sea Turtle Conservation Biology.
- Nelson, D.A. and D.D. Dickerson. 1988a. Effects of beach nourishment on sea turtles. In L.S. (ed.). Proceedings of the Beach Preservation Technology Conference '88. Florida & Beach Preservation Association, Inc., Tallahassee, FL.
- Nelson, D.A. and D.D. Dickerson. 1988b. Hardness of nourished and natural sea turtle nesting beaches on the east coast of Florida. Unpubl. report. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. 27pp.
- Nelson, D.A. and D.D. Dickerson. 1988c. Response of nesting sea turtles to tilling of nesting beaches, Jupiter Island, Florida. Unpubl. report. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. 26pp.
- Nelson, D.A., K. Mauck, and J. Fletemeyer. 1987. Physical effects of beach nourishment on turtle nesting, Delray Beach, Florida. Technical Report EL-87-15. U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS. 56pp.
- Nelson, W. G. 1985. Physical and biological guidelines for beach restoration projects. Part 1: Biological Guidelines. Sea Grant Proj. No. R/C-4. Rep. No. 76. 54 pp.
- 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*). J. Exp. Biol. 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*. *Physiol. Zool.* 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*). *J. Comp. Physiol. 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*). *Physiol. Zool.* 59(4):398-405.
- Parchure, T. M. 1982. St. Marys Entrance. Glossary of inlets. Rep. No. 11. Florida Sea Grant Project No. 44. 46 pp.
- Parmeter, C.J. 1980. Incubation of the eggs of the green sea turtle, *Chelonia mydas*, in Torres Strait, Australia: the effect of movement on hatchability. *Aust. Wildl. Res.* 7:487-491.
- Philbosian, R. 1976. Disorientation of hawksbill turtle hatchlings (*Eretmochelys imbricata*) by stadium lights. *Copeia* 1976:824.
- Pritchard, P.C.H. 1992. Leatherback turtle *Dermochelys coriacea*. Pages 214-218 in Moler, P.E. (ed.). *Rare and Endangered Biota of Florida, Volume III*. University Press of Florida, Gainesville, FL.
- Proceedings of habitat symposium: reconstruction growth impacts on coastal northeast Florida and Georgia. January 24-25, 1985. 1987. Sea Grant Proj. No. IR-84-4. Rep. No. 81. 322 pp.
- Raymond, P.W. 1984. The effects of beach restoration on marine turtles nesting in south Brevard County, Florida. Unpubl. M.S. thesis. University of Central Florida, Orlando, FL. 121pp.
- Robbins, C. S., B. Bruun, and H. S. Zim. 1966. *Birds of North America*. Golden Press. New York. 339 pp.
- Ross, J.P. 1982. Historical decline of loggerhead, ridley, and leatherback sea turtles. Pages 189-195 in Bjorndal, K.A. (ed.). *Biology and Conservation of Sea Turtles*. Smithsonian Institution Press, Washington, D.C.

- Ruppert, E. and R. Fox. 1988. Seashore animals of the southeast. A guide to common shallow-water invertebrates of the southeastern Atlantic coast. Univ. South Carolina Press. Columbia. 429 pp.
- 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. 51pp.
- U. S. Dept. of the Interior, Fish and Wildlife Service. 1982. Fish and Wildlife Coordination Act Report. Dredging and beach nourishment impacts on fish and wildlife resources. 8 pp.
- 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*). *Biol. Cons.* 55:139-149.

Table 1. Avian species occurring on Amelia Island, Nassau County, Florida. (From FDNR Division of Recreation and Parks.)

**Gulls and Terns**

Great black-backed gull	<i>Larus marinus</i>
Herring gull	<i>Larus argentatus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Laughing gull	<i>Larus atricilla</i>
Bonaparte's gull	<i>Larus philadelphia</i>
Least tern	<i>Sterna albifrons</i>
Common tern	<i>Sterna hirundo</i>
Forster's tern	<i>Sterna forsteri</i>
Sandwich tern	<i>Thalasseus sandvicensis</i>
Gull-billed tern	<i>Gelochelidon nilotica</i>
Royal tern	<i>Thalasseus maximus</i>
Caspian tern	<i>Hydroprogne caspia</i>
Black tern	<i>Chlidonias niger</i>
Black skimmer	<i>Rynchops nigra</i>

**Shearwaters**

Greater shearwater	<i>Puffinis gravis</i>
--------------------	------------------------

**Plovers**

Black-bellied plover	<i>Squatarola squatarola</i>
Piping plover	<i>Charadrius melodus</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>
Wilson's plover	<i>Charadrius wilsonia</i>
Killdeer	<i>Charadrius vociferus</i>

**Pelicans**

Brown pelican	<i>Pelecanus occidentalis</i>
White pelican	<i>Pelecanus erythrorhynchos</i>

**Gannets**

Northern gannet	<i>Morus bassanus</i>
-----------------	-----------------------

## Sandpipers

Solitary sandpiper	<i>Tringa solitaria</i>
Spotted sandpiper	<i>Actitis macularia</i>
Purple sandpiper	<i>Erolia pilocnemis</i>
Western sandpiper	<i>Ereunetes mauri</i>
Stilt sandpiper	<i>Micropalama himantopus</i>
Semipalmated sandpiper	<i>Ereunetes pusillus</i>
Least sandpiper	<i>Erolia minutilla</i>
Willet	<i>Catoptrophorus semipalmatus</i>
Ruddy turnstone	<i>Arenaria interpres</i>
Red knot	<i>Calidris canutus</i>
Dunlin	<i>Erolia alpina</i>
Sanderling	<i>Crocethia alba</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>
Common snipe	<i>Capella gallinago</i>
Marbled godwit	<i>Limosa fedoa</i>
Greater yellowlegs	<i>Totanus melanoleucus</i>
Lesser yellowlegs	<i>Totanus flavipes</i>
Long-billed curlew	<i>Numenius americanus</i>
Whimbrel	<i>Numenius phaeopus</i>

## Oystercatchers

American oystercatcher	<i>Haematopus palliatus</i>
------------------------	-----------------------------

## Loons

Common loon	<i>Gavia immer</i>
Red-throated loon	<i>Gavia stellata</i>

## Grebes

Horned grebe	<i>Podiceps auritus</i>
Red-necked grebe	<i>Podiceps grisegena</i>

## Cormorants

Double-crested cormorant	<i>Phalacrocorax auritus</i>
--------------------------	------------------------------

## Raptors

Marsh hawk

Osprey

Bald eagle

*Circus cyaneus*

*Pandion haliaetus*

*Haliaeetus leucocephalus*

Table 2. Bivalves. (From FDNR Division of Recreation and Parks).

Technical / Scientific Name	Author / Date	Common Name	Technical / Scientific Name	Author / Date	Common Name
<i>Abra aequalis</i>	(Say, 1822)	Common Atlantic Abra	<i>Ensis minor</i>	(Dall, 1900)	Minor Jackknife Clam
<i>Anadara ovalis</i>	(Bruguiere, 1879)	Blood Ark	<i>Epitonium angulatum</i>	(Say, 1830)	Angulate Wentletrap
<i>Anadara ovalis</i>	(Bruguiere, 1789)	Blood Ark	<i>Eupleura caudata</i>	(Say, 1922)	Thick Lipped Drill
<i>Anadara transversa</i>	(Say, 1822)	Transverse Ark	<i>Fasciolaria hunteria</i>	(Perry, 1911)	Banded Tulip
<i>Anatina anatina</i>	(Spengler)	Smooth Duck Clam	<i>Guekensia demissa</i>	(Dillwyn, 1817)	Ribbed Mussel
<i>Anomia simplex</i>	(Orbigny, 1942)	Common Jingle Shell	<i>Illanassa obsoleta</i>	(Say, 1822)	Eastern Mud Nassa
<i>Argopecten gibbus</i>	(Linne, 1758)	Calico Scallop	<i>Ischadium recurvum</i>	(Rafinesque, 1820)	Hooked Mussel
<i>Artrina rigida</i>	(Lightfoot, 1786)	Stiff Pen Shell	<i>Littorina irrorata</i>	(Say, 1822)	Marsh Periwinkle
<i>Artrina seminuda</i>	(Lamarch, 1819)	Half-naked Pen Shell	<i>Mercenaria mercenaria</i>	(Linne, 1758)	Quahog
<i>Atina serrata</i>	(Sowerby, 1825)	Saw Toothed Pen Shell	<i>Mulinia lateralis</i>	(Say, 1822)	Dwarf Surf Clam
<i>Barnea truncata</i>	(Say, 1822)	Fallen Angel Wing	<i>Nassarius trivittatus</i>	(Say, 1822)	New England Nassa
<i>Busycon canaliculatum</i>	(Linne, 1758)	Channeled Whelk	<i>Nassarius vibex</i>	(Say, 1822)	Common Eastern Na
<i>Busy carica</i>	(Gmelin, 1791)	Knobbed Whelk	<i>Noetia ponderosa</i>	(Say, 1822)	Ponderous Ark
<i>Busy carica eliceans</i>	(Moesfort, 1810)	Kieners Whelk	<i>Olica sayana</i>	(Ravenel, 1834)	Lettered Olive
<i>Busy carica contrarium</i>	(Coarad, 1840)	Lightning Whelk	<i>Petricola pboladiformis</i>	(Lamarck, 1818)	False Angel Wing
<i>Busycon spiratum pyruloides</i>	(Say, 1922)	Pear Whelk	<i>Pholas campechiensis</i>	(Gmelin, 1791)	Campeche Angel Wri
<i>Chione cancellata</i>	(Linne, 1767)	Cross Barred Venus	<i>Plicatula gibbosa</i>	(Lamarck, 1801)	Kittens Paw
<i>Chione intapurpura</i>	(Coarad, 1849)	Lady in Waiting Venus	<i>Polinices duplicatus</i>	(Say, 1822)	Shark Eye
<i>Crassostrea virginica</i>	(Gmelin, 1791)	Eastern Oyster	<i>Raeta plicatella</i>	(Lamarck, 1818)	Channeled Duck Clar
<i>Crepidula convexa</i>	(Say, 1822)	Convex Slipper Shell	<i>Sinum perspectivum</i>	(Say, 1831)	Babys Ear
<i>Crepidula fornicata</i>	(Linne, 1758)	Atlantic Slipper Shell	<i>Spissula solidissima similis</i>	(Say, 1822)	Surf Clam
<i>Crepidula plana</i>	(Say, 1822)	Eastern White Slipper Shell	<i>Strombus alatus</i>	(Gmelin, 1791)	Florida Fighting Con
<i>Cyrtopleura costata</i>	(Linne, 1758)	Angel Wing	<i>Tagelus plebeius</i>	(Lightfoot, 1786)	Stout Tagelus
<i>Dentalium americanum</i>	(Chenu, 1843)	Texas Tusk	<i>Tellina alternata</i>	(Say, 1822)	Alternate Tellin
<i>Dinocardium robustum</i>	(Lightfoot, 1786)	Giant Atlantic Cockle	<i>Terebra salleana</i>	(Deshayes, 1859)	Sallic's Auger
<i>Divaricella quadrisulcata</i>	(Orbigny, 1842)	Cross Hatched Lucine	<i>Thais haemastoma floridana</i>	(Coarad, 1837)	Florida Rock Shell
<i>Donax variabilis</i>	(Say, 1822)	Coquina	<i>Trebra dislocata</i>	(Say, 1822)	Common American A
<i>Dosina discus</i>	(Reeve, 1850)	Disk Dosina	<i>Urosalpinx cinereus</i>	(Say, 1822)	Atlantic Oyster Drill

Table 3. Locally occurring infauna. (From Johnson *et al.*, 1971)

**Phylum Nemertinea (Ribbon worms)**

Class Anopla

Burrowing ribbon worm	<i>Cerabratulus lacteus</i>
Pink ribbon worm	<i>Micrura leidyi</i>

**Phylum Sipuncula (Peanut worms)**

**Phylum Annelida (Segmented worms)**

Class Oligochaeta

Class Polychaeta

Plumed worm	<i>Diopatra cuprea</i>
Bamboo worm	<i>Heteromastus</i> sp.
Nereid worm	<i>Laonereis culveri</i>
Shimmy worm	<i>Nephtys picia</i>
Soda straw worm	<i>Onuphis microcephala</i>
Shingle tube worm	<i>Owenia fusiformis</i>
Unicorn worm	<i>Paraonis</i> sp.
Ice cream cone worm	<i>Cistenides gouldii</i>
Palp worms	<i>Scololepis</i> sp.
Ragged worm	<i>Scoloplos</i> sp.
Cellophane tube worm	<i>Spiochaetopterus oculus</i>
Common name unknown	<i>Streblospio benidicti</i>

**Phylum Arthropoda (Includes crustaceans)**

Class Crustacea

Pouch shrimp	Bodotriid
Thorn isopod	<i>Ancinus depressus</i>
Sand isopod	<i>Chiridotea caeca</i>
Common name unknown	<i>Cyathura polita</i>
Marine roly-poly	<i>Exosphaeroma diminutum</i>
Marine roly-poly	<i>Sphaeroma quadridentatum</i>
Common name unknown	<i>Acanthohaustorius</i> sp.

Bigclaw amphipod	<i>Corophium</i> sp.
Beach digger	<i>Haustorius</i> sp.
Common name unknown	<i>Lepidacrylus dystiscus</i>
Common name unknown	<i>Monoculodes</i> sp.
Common name unknown	<i>Neohaustorius schmitzi</i>
Common name unknown	<i>Parahaustorius longimerus</i>
Common name unknown	<i>Protohaustorius deichmannae</i>
Common name unknown	<i>Pseudohaustorius</i> sp.
Large beach hopper	<i>Talorchestia</i> sp.
Mud shrimp	<i>Callianassa major</i>
Atlantic ghost shrimp	<i>Callianassa atlantica</i>
Common mole crab	<i>Emerita talpoidea</i>
Square-eyed mole crab	<i>Lepidopa websteri</i>
Ghost crab	<i>Ocypode quadrata</i>
Long-eyed shrimp	<i>Ogyrides alphaerostris</i>
Small long-wristed hermit crab	<i>Pagurus longicarpus</i>
Worm pea crab	<i>Pinnixa chaetoptera</i>

#### Phylum Echinodermata (Spiny skinned)

Brittle stars	Various species
Sand dollar	<i>Mellita quinquesperforata</i>
Sea cucumber	<i>Synapta inhaerens</i>

#### Phylum Hemichordata (Acorn worms)

Helical acorn worm	<i>Saccoglossus kowalevskii</i>
Golden acorn worm	<i>Balanoglossus aurantiacus</i>
Common name unknown	<i>Lepidacrylus dystiscus</i>
Common name unknown	<i>Monoculodes</i> sp.
Common name unknown	<i>Neohaustorius schmitzi</i>
Common name unknown	<i>Parahaustorius longimerus</i>
Common name unknown	<i>Protohaustorius deichmannae</i>
Common name unknown	<i>Pseudohaustorius</i> sp.
Large beach hopper	<i>Talorchestia</i> sp.
Mud shrimp	<i>Callianassa major</i>
Atlantic ghost shrimp	<i>Callianassa atlantica</i>
Common mole crab	<i>Emerita talpoidea</i>
Square-eyed mole crab	<i>Lepidopa websteri</i>
Ghost crab	<i>Ocypode quadrata</i>
Long-eyed shrimp	<i>Ogyrides alphaerostris</i>

Small long-wristed  
hermit crab  
Worm pea crab

*Pagurus longicarpus*  
*Pinnixa chaetoptera*

**Phylum Echinodermata (Spiny skinned)**

Brittle stars  
Sand dollar  
Sea cucumber

Various species  
*Mellita quinquiesperforata*  
*Synapta inhaerens*

**Phylum Hemichordata (Acorn worms)**

Helical acorn worm  
Golden acorn worm

*Saccoglossus kowalevskii*  
*Balanoglossus aurantiacus*

**Appendix D**

**Pertinent Correspondence**

**Nassau County Shore Protection Project**

**GENERAL RE-EVALUATION REPORT WITH  
ENVIRONMENTAL ASSESSMENT**

**Nassau County, Florida**



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

REPLY TO  
ATTENTION OF

FEB 12 1999

Planning Division  
Environmental Branch

Mr. Ralph Cantral, Executive Director  
Florida Coastal Management Program  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

Dear Mr. Cantral:

I am writing you concerning your letter of September 15, 1998, regarding the Nassau County Beach, Florida, shore protection project (SAI number FL9807170503C).

The suggested requirement for "out-year monitoring of sea turtle nests for the three years of required compaction and escarpment monitoring" is not required by the Biological Opinion from the U.S. Fish and Wildlife Service (FWS) for this project. We have verified this with the FWS for an analogous project in St. Johns County. As such, we cannot accept this added requirement in accordance with the recently executed Standard Operating Procedure with the Florida Department of Environmental Protection. However, as in the case for the beach nourishment project in St. Johns County, the sponsor has agreed to continual monitoring and marking of sea turtle nests for the three years after project construction.

We are including the sponsor's commitment (as described above) into the final Environmental Assessment. If you have any questions, please contact Mr. Kenneth Dugger of my staff at 904.232-1686.

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosures



STATE OF FLORIDA  
**DEPARTMENT OF COMMUNITY AFFAIRS**

*"Helping Floridians create safe, vibrant, sustainable communities"*

LAWTON CHILES  
Governor

JAMES F. MURLEY  
Secretary

September 15, 1998

Mr. Vern Gwin  
Department of the Army  
Jacksonville District Corps of Engineers  
Post Office Box 4970  
Jacksonville, Florida 32232-0019

RE: Department of the Army - Beach Erosion Control Projects  
- Nassau County Shore Protection Project - General  
Reevaluation Report with Draft Environmental Assessment  
- Nassau County, Florida  
SAI: FL9807170503C

Dear Mr. Gwin:

The Florida State Clearinghouse, pursuant to Presidential 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 a review of the above-referenced project.

The Department of State (DOS) notes that a remote sensing survey has been conducted for the proposed borrow areas. The survey identified several potential targets. An archaeological diver identification of twelve of the targets has recently been conducted, and analysis of the data is currently underway. From the summary provided, the DOS notes that several of the targets may represent potentially significant historic properties. The DOS will coordinate with the applicant regarding the cultural material identified during the investigation. Please refer to the enclosed DOS comments.

The Department of Environmental Protection (DEP) indicates that, although the applicant has committed to escarpment and compaction monitoring and remediation for three years following beach renourishment activities, including leveling of escarpments during the marine turtle nesting season, there is no commitment to conduct out-year monitoring for marine turtle nests for that time interval. Removal of escarpments during the marine turtle

2555 SHUMARD OAK BOULEVARD • TALLAHASSEE, FLORIDA 32399-2100  
Phone: 850.488.8466/Suncom 278.8466 FAX: 850.921.0781/Suncom 291.0781  
Internet address: <http://www.state.fl.us/comaff/dca.html>

FLORIDA KEYS  
Area of Critical State Concern Field Office  
2796 Overseas Highway, Suite 212

GREEN SWAMP  
Area of Critical State Concern Field Office  
155 East Summerlin

SOUTH FLORIDA RECOVERY OFFICE  
P.O. Box 4022  
8600 N.W. 36th Street

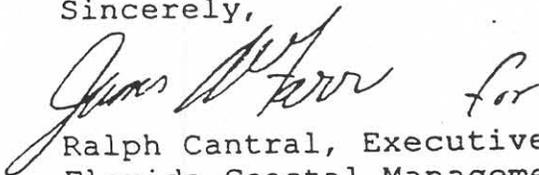
Mr. Vern Gwin  
September 15, 1998  
Page Two

nesting season requires that all nests be located and marked. Escarpment removal without such marking could result in the take of marine turtle nests, which would be contrary to Chapter 370.12, Florida Statutes (F.S.), and Chapter 370.414(1)(a)12, F.S. To ensure compliance with Florida Statutes, Sections 370.12(1)(c), (d), (e), and (f); and with the U.S. Fish and Wildlife Biological Opinion (Appendix C), the Environmental Commitment section of the final environmental assessment (EA) should include a provision for out-year monitoring of sea turtle nests for the three years of required compaction and escarpment monitoring. The monitoring commitment should be reflected in all planning documents associated with the project. The applicant has, in the past, resolved a similar issue with the St. Johns County Shore Protection Project (SAI 9712220821C) by providing a letter that agreed to include the DEP's out-year monitoring recommendations and the sponsor's willingness to conduct such monitoring in the final EA (correspondence enclosed). The DEP requests that a similar written commitment be made for this project. Please refer to the enclosed DEP comments.

Based on the information contained in the draft environmental assessment and the enclosed comments provided by our reviewing agencies, the state has determined that the above-referenced project is consistent with the Florida Coastal Management Program.

Thank you for the opportunity to review the draft environmental assessment. If you have any questions regarding this letter, please contact Ms. Cherie Trainor, Clearinghouse Coordinator, at (850) 922-5438.

Sincerely,

  
Ralph Cantral, Executive Director  
Florida Coastal Management Program

RC/cc

Enclosures

cc: Laura Ruhana, Department of Environmental Protection  
George Percy, Department of State



# Department of Environmental Protection

Lawton Chiles  
Governor

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

Virginia B. Wetherell  
Secretary

September 11, 1998

**RECEIVED**  
SEP 14 1998  
State of Florida Clearinghouse

Ms. Cherie Trainor  
Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

Re: USACOE Shore Protection Project, General Reevaluation Report With Draft  
Environmental Assessment, Nassau County

SAI: FL9807170503C

Dear Ms. Trainor:

The Florida Department of Environmental Protection (the Department) has reviewed the above-described project proposal and requests that the following comments and concerns be considered in the Final Environmental Assessment (EA) for this project.

The Draft EA outlines the plan for restoring eroded beaches in Nassau County along Amelia Island, including Fort Clinch State Park. Environmental Commitments included in the document are consistent with most of the U.S. Fish and Wildlife Service Biological Opinion, with three years of monitoring and re-mediating compaction and escarpments. Although the Corps has committed to escarpment and compaction monitoring and remediation for three years following beach renourishment activities, including leveling of escarpments during the marine turtle nesting season, there is no commitment to conduct out-year monitoring for marine turtle nests for that time interval. Removal of escarpments during the marine turtle nesting season requires that all nests be located and marked. The conduct of escarpment removal without such marking could result in the take of marine turtle nests, which would be contrary to Chapter 370.12, F.S. and Chapter 370.414(1)(a)12, F.S.

To insure compliance with Florida Statutes, Sections 370.12 (1)(c), (d), (e), and (f); and, with the U.S. Fish & Wildlife Biological Opinion (Appendix C), the Environmental Commitment section of the final EA needs to include a provision for out-year monitoring of sea turtle nests for the three years of required compaction and escarpment monitoring. This monitoring commitment should be reflected in all planning documents associated with

the project. Since monitoring is typically performed by local sea turtle conservation organizations, and mediated by the local government, it should not represent a significant change to on-going procedures. The Corps has in the past resolved a similar issue with the St. Johns County Shore Protection Project (SAI 97122220821C) by providing a letter that agreed to include the Department's out-year monitoring recommendations and the sponsor's willingness to conduct such monitoring in the final EA (correspondence enclosed). It is requested that a similar written commitment be made for this project.

Please see the enclosure for additional comments on the draft EA.

Thank you for the opportunity of commenting on this proposal. If you have any questions regarding this letter please give me a call at (850) 487-2231.

Sincerely,



Laura L. Ruhana  
Office of Intergovernmental Programs

Enclosures

cc: Robbin Trindell, BPSM  
Fritz Wettstein, Marine Resources  
Mark Latch, Recreation and Parks  
Paden Woodruff, Beaches and Coastal Systems



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

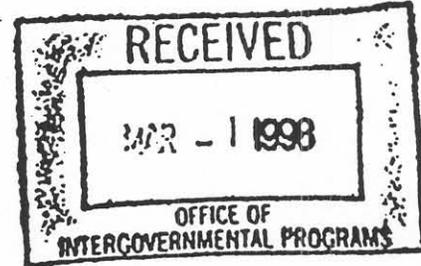


REPLY TO  
ATTENTION OF

February 23, 1998

Programs and Project Management Division  
Project Management Branch

Ms. Laura L. Ruhana  
Office of Intergovernmental Programs  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000



Dear Ms Ruhana:

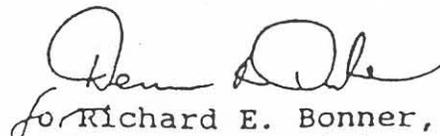
This is in response to your letter of February 19, 1998, and a subsequent phone conversation with Mr. Ken Dugger and Mr. Rick McMillen of the Jacksonville District on the same day. In your letter you had expressed two concerns and recommendations as they related to the shore protection project for St. Johns County described in the General Reevaluation Report (GRR) with draft Environmental assessment (EA). The following paragraphs provide a response to your concerns.

The Jacksonville District concurs with your recommendations to ensure that no take of marine turtles occurs during the removal of escarpments during the nesting season. Discussions with the non-Federal sponsor, St. Johns County, revealed that they too are in agreement with the recommendations stated in your letter. Furthermore, the Jacksonville District will incorporate your recommendations and the sponsors willingness in the final EA.

As for the removal of armoring and rip-rap structures, the Jacksonville District concurs that the rubble rip-rap located on the south end of Anastasia State Recreation Area be removed prior to placement of any beach fill. Removal of this rubble as well as any other derelict structures will be included in our design and referenced in the final EA. However, as agreed to in our telephone conversation with you, removal of armoring does not involve the reveted portion of the shoreline in the vicinity of the pier and adjacent office buildings and homes. This revetment has been factored into our design and is an integral part of the shore protection measures recommended for the upland development.

Should you have any questions or need any additional information, please contact Mr. Rick McMillen, at 904-232-1231.

Sincerely,

  
for Richard E. Bonner, P.E.  
Deputy District Engineer  
for Project Management

SAI 9807170503, NASSAU COUNTY SHORE PROTECTION  
ADDITIONAL COMMENTS

1. Please note that the Department's Bureau of Beaches and Coastal Systems (BBCS) has selected an alternative shore protection design for Fort Clinch and has moved forward with the design and permitting of the project. The Department's design utilizes groins rather than the revetment as proposed in the General Reevaluation Report.
2. The BBCS staff are concerned regarding the use of a portion of the proposed borrow source for the beach restoration project. Specifically, excavation of the landwardmost portions of the borrow area may potentially change wave energy and direction resulting in erosional hot spots. Concerns regarding the borrow source will be addressed during the Department's permitting process. Staff have also suggested that beach quality maintenance material, dredged from the inlet channel, be placed within the project area as a means to extend the nourishment interval.
3. Placement of pipeline on the beach within Ft. Clinch State Park will require an easement from the Department's Division of Recreation and Parks.
4. Regarding manatee protection, we recommend that the standard manatee protection construction conditions be followed for all in-water work.
5. A specific project schedule for the different phases of this project is not included, making it difficult for the Department to evaluate the potential impacts to beach recreation at Ft. Clinch State Park. As stated on page EA-6, the warmer months result in higher recreational use of the beach. Placement of pipelines and the use of heavy machinery on beaches during the summer months is expected to adversely impact visitor use at Ft. Clinch State Park. If renourishment activities are planned for the warmer months, the reduction of visitor use should be recognized in the EA.
6. Page 6, Other Studies and Reports - The Department is involved with the St. Marys Entrance Inlet Management Study by Olsen Associates, Inc. (1997). This Study and its conclusions should be referenced in this section.
7. Page 64, Environmental Considerations - The Department's District 2 Biological staff recognize the beach at Ft. Clinch State Park as being an important resting and foraging site for diverse groups of shorebirds. Species such as Purple Sandpiper, Black Skimmer, and Least Tern are known to occur in the broad beach area south of the jetties and the fishing pier. Because the newly deposited sand will be temporarily sterile, it could diminish the breeding success of nesting shore birds that depend on a constant food source during critical periods of the breeding season (spring and summer months). We recommend that this information be included in the Environmental Considerations Section of the final EA.

8. Environmental Assessment, Pages EA-10 and EA-11, #8 - Turbidity monitoring is discussed in this section of the report. Please include information about the frequency, methodology, and who will conduct this monitoring.

9. U.S. Fish and Wildlife Service Report, Page 12, Conclusion - There appears to be typographical errors and this paragraph does not make sense.

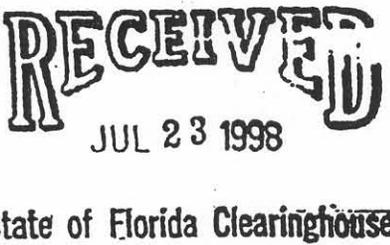
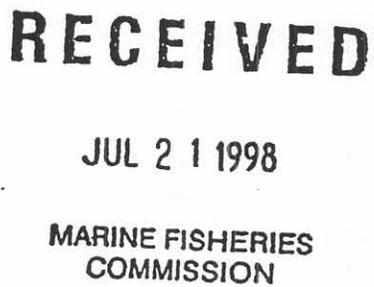
10. Pages 61 and 62 of the Introductory section are missing and should be included in the final EA.

11. The report contains references that are not cited in the bibliography. For example: Pilkey et al., 1984 (page 18, #59), Balsillie 1988 (page 20, #70), and Glassman 1983 (page 27, end of first paragraph).

UNTY: Nassau

DATE: 07/20/98  
COMMENTS DUE-2 WKS: 08/04/98  
CLEARANCE DUE DATE: 08/31/98  
SAI#: FL9807170503C

Message:

STATE AGENCIES	WATER MANAGEMENT DISTRICTS	OPB POLICY UNITS
Community Affairs Environmental Protection Game and Fresh Water Fish Comm X Marine Fisheries Commission OTTED State Transportation	St. Johns River WMD  <div style="text-align: center;">  </div>	Environmental Policy/C & ED  <div style="text-align: center;">  </div>

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 - Nassau County Shore Protection Project - General Reevaluation Review with Draft Environmental Assessment - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

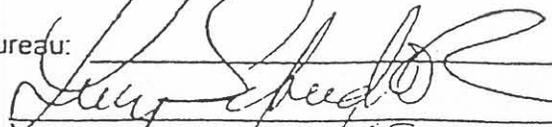
EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

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

MARINE FISHERIES COMMISSION  
2540 EXECUTIVE CENTER CIRCLE WEST  
SUITE 106  
TALLAHASSEE FL 32301

From: \_\_\_\_\_  
Division/Bureau: \_\_\_\_\_  
Reviewer:  \_\_\_\_\_  
Date: 7/22/98

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
Marine Fisheries Commission  
X OTTED  
State  
Transportation

St. Johns River WMD

Environmental Policy/C & ED

RECEIVED  
JUL 28 1998  
State of Florida Clearinghouse

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 - Nassau County Shore Protection Project - General Reevaluation Report with Draft Environmental Assessment - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

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

From:

Division/Bureau: OTTED

Reviewer: M. Blakeslee

Date: 7/25/98



FLORIDA DEPARTMENT OF STATE  
Sandra B. Mortham  
Secretary of State  
DIVISION OF HISTORICAL RESOURCES

RECEIVED  
AUG 24 1998

August 14, 1998

Ms. Cherie Trainor  
State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, Florida 32399-2100

In Reply Refer To: *State of Florida Clearinghouse*  
Scott B. Edwards  
Historic Sites Specialist  
Project File No. 984961

RE: Cultural Resource Assessment Request  
SAI# FL9807170503C  
Department of the Army - Nassau County Shore Protection Project  
General Re-evaluation Report with Draft Environmental Assessment  
Nassau County, Florida

Dear Ms. Trainor:

In accordance with the provisions of Florida's Coastal Zone Management Act and Chapter 267, *Florida Statutes*, as well as the procedures contained in 36 C.F.R., Part 800 ("Protection of Historic Properties"), we have reviewed the referenced project for possible impact to historic properties listed, or eligible for listing, in the *National Register of Historic Places*, or otherwise of historical or architectural value.

We note that a remote sensing survey has been conducted of the proposed borrow areas. This survey identified several potential targets. It is our understanding that archaeological diver identification of 12 of the targets has recently been conducted, and that analysis of the data is still underway. From the summary provided, we note that several of the targets may represent potentially significant historic properties. This office will be coordinating with the U. S. Army Corps of Engineers regarding the cultural materials identified during the investigation.

If you have any questions concerning our comments, please do not hesitate to contact us. Your interest in protecting Florida's historic properties is appreciated.

Sincerely,

*Laura A. Kammerer*

*for*

George W. Percy, Director  
Division of Historical Resources  
and  
State Historic Preservation Officer

GWP/Ese

cc: Jasmin Raffington, FCMP-DCA

DIRECTOR'S OFFICE

R.A. Gray Building • 500 South Bronough Street • Tallahassee, Florida 32399-0250 • (850) 488-1480  
FAX: (850) 488-3353 • WWW Address <http://www.dos.state.fl.us>

ARCHAEOLOGICAL RESEARCH

HISTORIC PRESERVATION

HISTORICAL MUSEUMS

Message:

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
Marine Fisheries Commission  
OTTED  
State  
X Transportation

St. Johns River WMD

Environmental Policy/C & ED

RECEIVED  
JUL 27 1998

State of Florida Clearinghouse

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.

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 - Nassau County Shore Protection Project - General Reevaluation Report with Draft Environmental Assessment - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

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

From:

Division/Bureau: FOOT DIST. 2 PLANNING

Reviewer: [Signature]

Date: 7/23/98

TO: Nassau

# 1706 7/21/98

DATE: 07/20/98

COMMENTS DUE-2 WKS: 08/04/98

CLEARANCE DUE DATE: 08/31/98

SAI#: FL9807170503C

FROM:

JUL 21 1998

STATE AGENCIES

WATER MANAGEMENT DISTRICTS

OPB POLICY UNITS

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
Marine Fisheries Commission  
TTED  
State  
Transportation

X St. Johns River WMD

Environmental Policy/C & ED

RECEIVED  
JUL 31 1998

State of Florida Clearinghouse

Attached document requires a Coastal Zone Management Act/Florida  
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.

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 - Nassau County Shore  
Protection Project - General Reevaluation Report  
with Draft Environmental Assessment - Florida.

To: Florida State Clearinghouse

EO. 12372/NEPA

Federal Consistency

Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

- No Comment
- Comments Attached
- Not Applicable

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

From:

Division/Bureau: SJRWMD/OAA

Reviewer: MSpokane 7/28/98

Date: \_\_\_\_\_

Message:

DATE: 07/20/98  
COMMENTS DUE-2 WKS: 08/04/98  
CLEARANCE DUE DATE: 08/31/98  
SAI#: FL98071705

STATE AGENCIES

Community Affairs  
Environmental Protection  
Game and Fresh Water Fish Comm  
Marine Fisheries Commission  
OTTED  
State  
Transportation

WATER MANAGEMENT DISTRICTS

St. Johns River WMD

OPB POLICY UNITS

X Environmental Policy/C & ED

**RECEIVED**

July 21, 1998

OFFICE OF PLANNING  
& BUDGETING  
ENVIRONMENTAL POLICY UNIT

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.

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 - Nassau County Shore Protection Project - General Reevaluation Report with Draft Environmental Assessment - Florida.

To: Florida State Clearinghouse  
Department of Community Affairs  
2555 Shumard Oak Boulevard  
Tallahassee, FL 32399-2100  
(850) 922-5438 (SC 292-5438)  
(850) 414-0479 (FAX)

EO. 12372/NEPA

Federal Consistency

- No Comment
- Comments Attached
- Not Applicable

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

From:

Division/Bureau: OPB / Env. Policy  
Reviewer: Caroline Johnson  
Date: 8-3-98



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

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

August 5, 1998

Mr. George M. Strain  
Department of the Army, Corps of Engineers  
Planning Division, Environmental Branch  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Strain:

The National Marine Fisheries Service (NMFS) has reviewed the General Reevaluation Report, prepared by the Corps of Engineers, dated June 1998, with Draft Environmental Assessment (DEA) for the Shore Protection Project, St. Mary's Inlet, Amelia Island, Cumberland Sound, in Nassau County, Florida, which addresses the environmental impacts. The recommended action involves the construction of beach erosion control measures along a 4.3 mile reach of Amelia Island, starting from the south jetty of St. Mary's Inlet south to Sadler Road. The primary borrow source would be the South Channel Borrow area, immediately south of St. Mary's Entrance channel. Nourishment would be provided at 5-year intervals over the 50-year life of the project. A shore protection project is also proposed at the Fort Clinch State Park which would involve the construction of a new groin on the north side of Fort Clinch and connecting groins with a rock revetment and backfill.

The DEA provides adequate information to assess the environmental issues and we concur with your recommended action for the shore protection measures along Amelia Island and the Fort Clinch State Park. Based on the information provided in the notification, the NMFS does not anticipate that the proposed action will have any significant impact on marine, estuarine, or anadromous fishery resources.

Sincerely,

Andreas Mager, Jr.  
Assistant Regional Administrator  
Habitat Conservation Division





United States Department of the Interior

FISH AND WILDLIFE SERVICE

6620 Southpoint Drive South

Suite 310

Jacksonville, Florida 32216-0912

IN REPLY REFER TO:  
FWS/R4/ES-JAFL

NOV 5 1997

A.J. Salem  
Chief, Planning Division  
U.S. Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

Dear Mr. Salem:

In accordance with the Transfer Fund Agreement between the Fish and Wildlife Service and the Jacksonville District Corps of Engineers, this letter transmits the Final Coordination Act Report and biological opinion on the proposed Nassau County Shore Protection Project, Florida.

For further coordination on this project, please contact Don Palmer in this office at (904) 232-2580, ext. 115.

Sincerely,

*Michael M. Bentzien*

Michael M. Bentzien

Assistant Field Supervisor



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



REPLY TO  
ATTENTION OF

September 25, 1997

Planning Division  
Environmental Branch

Mr. David Hankla  
Field Supervisor  
U.S. Fish and Wildlife Service  
6620 Southpoint Drive, South, Suite 310  
Jacksonville, Florida 32217

Dear Mr. Hankla:

This refers to the Nassau County, Shore Protection Project, General Reevaluation Report (GRR). A Fish and Wildlife Service, Draft Coordination Act Report was prepared by your office in 1993 to evaluate fish and wildlife resource effects from the proposed placement of dredged sand material on Fernandina Beach.

Except for the enclosed shore protection measures developed for Fort Clinch, there's been essentially no change in the project area being considered for renourishment.

Please prepare the Final Coordination Act report for the Nassau County, Shore Protection Project. The Study Manager is William Lang 904-232-2615.

Sincerely,

Dennis R. Duke  
Acting Chief, Planning Division

Enclosure



# United States Department of the Interior

FISH AND WILDLIFE SERVICE  
6620 Southpoint Drive, South  
Suite 310  
Jacksonville, Florida 32216-0912

JUL 26 1993

Mr. A. J. Salem  
Chief, Planning Division  
U. S. Army Corps of Engineers  
P. O. Box 4970  
Jacksonville, FL 32232-0019

Dear Mr. Salem:

In accordance with the Scope of Work for the Nassau County Shore Protection Project, the Service has enclosed a draft of the Fish and Wildlife Coordination Act Report for your review.

Draft copies of this report have also been submitted to the following agencies for their review and comment:

FDEP Division of Beaches and Shores  
FDEP Fort Clinch State Park  
FDEP Talbot Islands Geopark  
FGFWFC Office of Environmental Services  
National Marine Fisheries Service  
NPS Timucuan Ecological Preserve  
NPS Cumberland Island National Seashore  
FDEP Office of Protected Species Management

The Service looks forward to receiving your comments and finalizing the report. If you have a question, please contact either Don Palmer or Jim Valade in this office.

Sincerely,

Michael M. Bentzien  
Assistant Field Supervisor



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
3100 University Blvd. South  
Suite 120  
Jacksonville, Florida 32216

MAR 12 1993

Mr. A.J. Salem  
Chief, Planning Division  
U.S. Army Corps of Engineers  
P.O. Box 4970  
Jacksonville, Florida 32232-0019

FWS Log No: 4-1-93-218C

This responds to your letter of March 1, 1993, requesting a list of federally threatened and endangered species for the Nassau County Shore Protection project. Listed below are the threatened and endangered species that may be found within the area of influence of this project.

Manatee	<i>Trichechus manatus</i>	Endangered
Loggerhead Turtle	<i>Caretta caretta</i>	Threatened
Leatherback Turtle	<i>Dermochelys coriacea</i>	Endangered
Woodstork	<i>Mycteria americana</i>	Endangered
Piping Plover	<i>Charadrius melodus</i>	Threatened

We appreciate the opportunity to provide our comments. If you have a question, please contact Don Palmer in this office.

Sincerely,

Michael M. Bentzien  
Assistant Field Supervisor



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

Southeast Regional Office  
9450 Koger Boulevard  
St. Petersburg, FL 33702

March 4, 1993

F/SE013:LFS

Mr. A. J. Salem  
Chief, Planning Division  
Department of the Army  
Jacksonville District Corps of  
Engineers  
P. O. Box 4970  
Jacksonville, FL 32232-0019

Dear Mr. Salem:

Per your request of March 1, 1993, the enclosed list contains species under the National Marine Fisheries Service jurisdiction that may occur in the marine environment off the Atlantic coast of Florida. If you have any questions, please contact this office at 813/893-3366.

Sincerely yours,

Linda Stevens  
Permit Specialist  
Protected Species Management  
Branch

Enclosure



ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITATS  
UNDER  
NMFS JURISDICTION

Florida: Atlantic Coast

<u>Listed Species</u>	<u>Scientific Name</u>	<u>Status</u>	<u>Date Listed</u>
finback whale	<u>Balaenoptera physalus</u>	E	12/02/70
humpback whale	<u>Megaptera novaeangliae</u>	E	12/02/70
right whale	<u>Eubaleana glacialis</u>	E	12/02/70
sei whale	<u>Balaenoptera borealis</u>	E	12/02/70
sperm whale	<u>Physeter catodon</u>	E	12/02/70
green sea turtle	<u>Chelonia mydas</u>	Th	07/28/78
hawksbill sea turtle	<u>Eretmochelys imbricata</u>	E	06/02/70
Kemp's (Atlantic) ridley sea turtle	<u>Lepidochelys kempi</u>	E	12/02/70
leatherback sea turtle	<u>Dermochelys coriacea</u>	E	06/02/70
loggerhead sea turtle	<u>Caretta caretta</u>	Th	07/28/78

SPECIES PROPOSED FOR LISTING

None

LISTED CRITICAL HABITAT

None

PROPOSED CRITICAL HABITAT

None

Memo for the Record  
Nassau County Shore Protection Project  
EFH determination

November 21, 2003

From: Terri Jordan – Biologist, Environmental Branch



This memo serves to document the Jacksonville District's assertion that construction of the Nassau County Shore Protection Project (NCSPP), Nassau County, Florida will not adversely affect Essential Fish Habitat as designated by the National Marine Fisheries Service (NMFS) and the South Atlantic Fisheries Management Council (SAFMC) under the Magnuson-Stevens Fisheries Act.

The Jacksonville District Engineer signed a Finding of No Significant Impact (FONSI) for the Environmental Assessment of the NCSPP on March 17, 1999. The Secretary of Commerce, through NMFS, approved a Generic EFH Amendment to all fisheries administered by the SAFMC in July 1999 (email from Mr. Rickey Ruebsamen, NMFS-SERO – July 26, 2002). As part of the regulations promulgated for EFH under Magnuson-Stevens, NMFS made the following determination concerning "grandfathering" of projects: EFH Regulations at 600.920(a)(1) states that EFH consultation is not required for actions that were completed prior to approval of the EFH designations by the Secretary.

As a result of these regulations, the Jacksonville District of the Corps is not required to complete consultation for adverse impacts to EFH since the FONSI for the project was signed prior to the implementation of the SAFMC habitat plan for fisheries under their jurisdiction.

In addition, information gathered by the District documents that beach nourishment projects that are constructed in soft bottom, sandy areas have no adverse impacts on fish and benthos assemblages in the borrow or deposition areas.

A study entitled "The New York District's Biological Monitoring Program for the Atlantic Coast of New Jersey, Asbury Park to Manasquan Section Beach Erosion Control Project", conducted by Dr. Gary Ray, ERDC for the New York District on the potential impacts of beach nourishment on nearshore and surf zone ichthyoplankton and offshore borrow site fisheries and benthos.

The study was conducted during the beach nourishment operations at Asbury Park, New Jersey from 1995 – 1999. Particular attention was paid to temporal and spatial patterns of distribution, abundance, size, stage and species composition prior to, during, and after beach nourishment. Results of the nearshore and surf zone portion of this study found that there "were no obvious differences between reference and nourished beaches based on the analysis of a number of parameters (physical, surf zone ichthyoplankton abundance, size and species composition)." Additional investigation of fish and benthos assemblages

at the borrow areas demonstrated no evidence of change in assemblage structure or catch after dredging.

In the Final EIS prepared for the Broward County Shore Protection Project, impacts of dredging borrow areas and beach placement on ichthyofauna and infauna of the borrow and deposition areas were analyzed. The FEIS found that short-term impacts within the borrow areas is likely, however "Several studies have investigated the recolonization of beach infauna following nourishment and found that beach and surf zone populations recover to prenourishment levels within one year after completion of nourishment (Reilly and Bellis, 1983; Gorzelany and Nelson, 1987; Hurme and Pullen, 1988; and Dodge et al, 1991; 1995)." Additionally the FEIS found "Numerous studies have documented that macroinfaunal organisms rapidly colonize offshore borrow pits after completion of dredging activities (Saloman and Naughton, 1984; Cutler and Mahadevan, 1982; Naqvi and Pullen, 1982; Gorzelany, 1983; Reilly and Bellis, 1983; Gorzelany and Nelson, 1987; Hurme and Pullen, 1988). Bowen and Marsh (1988) observed recovery of the macroinfaunal communities in a borrow area offshore of Delray Beach, Florida within one year of construction. Other studies have suggested that recovery to pre-dredging macroinfaunal community structure may take from two to three years (Goldberg, 1985; Wilber and Stern, 1992). Benthic infauna monitoring performed during previous beach nourishment projects in Broward County indicated that, although the borrow areas were rapidly colonized following dredging, individual species recovered at different rates based upon their generation time, ability to disperse, and reproductive strategies (Dodge et al., 1995)."

The Broward County SPP FEIS also addresses potential impacts to fishes in the project area "Direct impacts to fish communities within and adjacent to the offshore borrow areas during dredging activities should be minimal. The motility of most reef fish species should allow these species to leave the disturbed area during dredging and return when conditions approximate previous levels."

Based on the findings of the New Jersey study and the Broward County SPP FEIS, the Jacksonville District has determined that there will be no adverse impact to designated EFH from the NCSPP.

**Lang, William J SAJ**

---

**From:** Dugger, Kenneth R SAJ  
**Sent:** Monday, July 29, 2002 8:04 AM  
**To:** Lang, William J SAJ  
**Cc:** McAdams, James J SAJ; Jordan, Terri L SAJ; Acosta, Ivan SAJ; Cintron, Barbara B SAJ; Mason, Loren M SAJ; Fonferek, William J SAJ; Dupes, Michael SAJ  
**Subject:** FW: EFH consultation-normal maintenance and Grandfather Provision

-----Original Message-----

**From:** Moore, Brooks W SAJ  
**Sent:** Friday, July 26, 2002 9:02 AM  
**To:** Dugger, Kenneth R SAJ  
**Subject:** FW: EFH consultation-normal maintenance

-----Original Message-----

**From:** Rickey Ruebsamen [mailto:ric.ruebsamen@noaa.gov]  
**Sent:** Friday, July 26, 2002 8:46 AM  
**To:** Moore, Brooks W  
**Cc:** Andy Mager; Jon Kurland  
**Subject:** EFH consultation-normal maintenance

Brooks:

This is in response to your call regarding EFH consultation requirements for maintenance of Federal projects. The EFH rule at 600.920(a)(1) states that EFH consultation is not required for actions that were completed prior to the approval of the EFH designations by the Secretary (roughly July 1999 for S. FL). In previous meetings and discussions with the Jacksonville Planning staff, I advised them that EFH consultation would not have to be initiated for routine maintenance activities IF the geometry of the dredge and disposal sites is unchanged from that coordinated prior to the advent of EFH and there are no administrative requirements for preparation of a public notice or NEPA document.

Also, please reference the NMFS' May 3, 1999, interagency finding with the Jacksonville District. Page 2 of the finding specifies that:

"In cases involving maintenance activities (especially navigation channels) EFH consultation normally will not be conducted for each event. Rather, consultation will be incorporated into the District's NEPA compliance or public notification events which occur no more frequently than every 5 to 10 years, unless project design parameters change."

I hope this provides the explanation/clarification that you desired. Let me know if there is anything else I can do.

Ric

Planning Division  
Environmental Branch

SEP 23 2004

Mr. Frederic Gaske  
Director, Division of Historical Resources  
State Historic Preservation Officer  
500 South Bronough Street  
Tallahassee, Florida 32399-0250

Dear Mr. Gaske:

The U.S. Army Corps of Engineers, Jacksonville District, is developing a sand source to be used for shore protection in Nassau County. Prior consultation (DHR No. 2001-08681) identified four historic shipwrecks (targets 6, 15, 20, and 21) and three potentially associated historic anchors (targets 16, 17 and 18) within the sand source area. Three options were proposed: 1) data recovery, 2) a 1000-foot radius no-impact zone, or 3) a large regional no-impact zone. Your office recommended option 3, the large regional no-impact zone and requested review of the plan. Three of the historic shipwrecks (targets 15, 20, and 21) and the three historic anchors are clustered and can be reasonably protected by a regional no impact zone. However, shipwreck at target 6 is about a mile away from the closest other shipwreck. This would make including target 6 in a regional no impact zone impractical. Therefore, I am proposing a regional no impact zone in the south portion of the borrow area with its boundary 1000 feet north of targets 20 and 17, and a 1000 radius buffer around target 6 (see enclosed map).

With these avoidance procedures, I have determined that the Nassau County Shore Protection Project will have no effect on historic properties eligible for listing on the National Register of Historic Places. I request your concurrence with my determination of no effect to significant cultural resources. If there are any questions, please contact Mr. Grady Caulk at 904-232-1786 or e-mail at [grady.h.caulk@saj02.usace.army.mil](mailto:grady.h.caulk@saj02.usace.army.mil).

Sincerely,

James C. Duck  
Chief, Planning Division

Enclosure



FLORIDA DEPARTMENT OF STATE  
**Glenda E. Hood**  
Secretary of State  
DIVISION OF HISTORICAL RESOURCES

Mr. James C. Duck  
Jacksonville District Corps of Engineers  
P.O. Box 4970  
Jacksonville, FL 32232-0019

November 4, 2004

Re: DHR Project File No. 2004-9184B (2001-8681)  
Additional Information Received by DHR: November 2, 2004  
*Archaeological Diver Identification and Evaluation of Twelve Potentially Significant Submerged Targets in the Shore Protection Project Borrow Area, Nassau County, Florida*

Dear Mr. Duck:

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

In 1998, Mid-Atlantic Technology and Environmental Research, Inc. conducted an archaeological diver identification and evaluation of twelve potentially significant submerged targets in the shore protection project borrow area in Nassau County on behalf of the U.S. Army Corps of Engineers. Four previously unidentified historic shipwrecks and three potentially associated historic anchors were identified within the project area during the investigation.

Three options were presented for avoiding, minimizing, and/or mitigating any adverse effects to these historic resources. A large no-impact zone was adopted across the southern portion of the borrow area encompassing targets, 15, 17, 20, and 21 and a 1000 radius buffer around target 6. It is the opinion of Mid-Atlantic Technology and Environmental Research, Inc. that these buffer areas will successfully protect the historic resources from impact caused by dredging activities.

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

If you have any questions concerning our comments, please contact Ron Grayson, Historic Sites Specialist, by phone at (850) 245-6333, or by electronic mail at [rgrayson@dos.state.fl.us](mailto:rgrayson@dos.state.fl.us). Your continued interest in protecting Florida's historic properties is appreciated.

Sincerely,

*for* *James R. Kammerer, Deputy SHPO*

Frederick Gaske, Director, and  
State Historic Preservation Officer

Xc: Wes Hall – Mid-Atlantic Technology and Environmental Research, Inc.  
500 S. Bronough Street • Tallahassee, FL 32399-0250 • <http://www.flheritage.com>

<input type="checkbox"/> Director's Office (850) 245-6300 • FAX: 245-6435	<input type="checkbox"/> Archaeological Research (850) 245-6444 • FAX: 245-6436	<input checked="" type="checkbox"/> Historic Preservation (850) 245-6333 • FAX: 245-6437	<input type="checkbox"/> Historical Museums (850) 245-6400 • FAX: 245-6433
<input type="checkbox"/> Palm Beach Regional Office (561) 279-1475 • FAX: 279-1476	<input type="checkbox"/> St. Augustine Regional Office (904) 825-5045 • FAX: 825-5044	<input type="checkbox"/> Tampa Regional Office (813) 272-3843 • FAX: 272-2340	