

FINAL
ENVIRONMENTAL ASSESSMENT (EA)
AND FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR THE
PAWLEYS ISLAND
GENERAL INVESTIGATION STUDY
OF
HURRICANE AND STORM DAMAGE REDUCTION
GEORGETOWN COUNTY
SOUTH CAROLINA

U.S. Army Corps of Engineers
Charleston District
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**Environmental Assessment
and Finding of No Significant Impact
for the
Pawleys Island
General Investigation Study
of
Hurricane and Storm Damage Reduction
Georgetown County
South Carolina**

I. INTRODUCTION

A. Project Authority, Purpose and Need. The Pawleys Island hurricane and storm damage protection GI study is being conducted in response to a resolution adopted on 22 April 1988 by the Committee on Environment and Public Works of the United States Senate. This study was initiated following receipt of an April 20, 1998 letter request from the Town of Pawleys Island seeking assistance. As a result of the receipt of this letter, an expedited reconnaissance study was approved in September 1998 by the Corps of Engineers, South Atlantic Division with a recommendation to continue into the feasibility phase. A feasibility cost-sharing agreement was executed on April 28, 2000. This environmental assessment (EA) will address an evaluation of the placement of sufficient sand to weather five, ten, and twenty-year storm events. This work should provide improved and longer-term hurricane damage protection for the island. In addition, the improved beach conditions will provide a valuable habitat for the Wilson's plover, least tern, and Loggerhead sea turtle. There will also be an evaluation of the potential for re-establishing a population of seabeach amaranth.

This barrier island is located on the SC coast, approximately 23 miles south of Myrtle Beach and about 70 miles north of Charleston, SC (see Figure 1). As documented in the feasibility cost-sharing agreement, the Town of Pawleys Island will be responsible for the non-Federal portion of the study, construction, and maintenance after completion. The purpose and need of this project is to protect the island structures from the impacts of storm events. Development at the south end was severely impacted and 27 of the 29 houses located there were destroyed when Hurricane Hugo hit the area. Further, a channel breached the southern spit but was consequently filled and the houses rebuilt.

B. Project Location and Description of Proposed Action. The study area extends from the south end of the south parking lot to approximately 450 feet north of the 2nd Avenue public access (see Figure 1), and is divided into three separate reaches. The Southern Reach extends from the south end of the south parking lot to Groin #12, which is located approximately 1,860 feet north of the Hazard Street public access. In addition to the public accesses and parking at the south parking lot and Hazard Street, there is also public access and parking at Pritchard Street. The Central Reach extends from Groin #12 to Groin #22 and there are no public access or parking opportunities. The Northern Reach extends from Groin #22 to approximately 450 feet north of the 2nd Avenue public access. In addition to the public access and parking at 2nd Avenue, the Northern Reach also has public access and parking at 1st Avenue. Additionally, there are public accesses and parking sites at 3rd Avenue and Shell Avenue, which are located north of the Northern Reach (see Figure 1). The proposed project will include the placement of

sand only along the Southern Reach to protect existing structures. Placement of sand along the Central and Northern Reaches of the project area was not economically justified for hurricane storm damage protection. Placement of sand along these two reaches was also considered for improvement of sea turtle nesting habitat and re-colonization of Sea-beach amaranth; however, this could not be justified either.

The recommended plan of improvement for Pawleys Island is a protective sand fill berm consisting of 165-foot berm starting at +7.0 feet NGVD29 with a seaward slope of 1V:15H. In addition, the recommended plan will include a 20-foot wide dune at elevation +10.0 feet NGVD 29, with side slopes of 1V:5H (see Figure 2: a typical cross-section). The recommended plan will be placed along the Southern Reach of the project study area between existing Groin No. 1 and existing Groin No. 12. The length of the project reach is approximately 7,500 feet and includes a full design section that is 6,800 feet long and taper sections on each end of the full design section that are each 350 feet long (see Figure 3). The total quantity of sand required to complete initial placement is approximately 666,400 cubic yards, of which approximately 633,800 cubic yards are required for the full design section and approximately 16,300 cubic yards are required for each taper. Of the total initial placement volume required to support the recommended plan, approximately 361,100 cubic yards are required to support the design berm and taper volumes, and approximately 305,300 cubic yards are required to support initial advance nourishment and overfill for the periodic nourishment cycle. The recommended plan is optimized around a 9-year periodic renourishment cycle through the 50-year period of analysis. There will be four 9-year renourishments requiring approximately 305,300 cubic yards of sand for each renourishment and one, 5-year renourishment requiring approximately 169,600 cubic yards of sand. An approximate total of 1,390,800 cubic yards of sand will be required to support the periodic nourishment requirements for the recommended plan.

(Note: The 165-foot berm consists of a 50-foot project with 115 feet of advance re-nourishment.)

The placement of sand along the Southern Reach will secondarily provide a suitable environment for sea turtle nesting and has the potential to provide a suitable substrate for re-colonization of the threatened Sea-beach amaranth. It is possible that the Town of Pawleys Island will perform nourishment of the Central Reach after completion of the Corps of Engineers nourishment of the Southern Reach, however, our recommended plan calls for the taper above Groin #12 to tie into the existing shoreline. Since nourishment of the Central Reach will be performed as a non-Federal project, any environmental effects associated with nourishment of the Central Reach are not discussed in this assessment; however, these effects will be similar to what will be experienced in the Southern Reach. The Town of Pawleys Island will be required to obtain Federal and State permits before nourishment of the Central Reach can be performed.

Construction would most likely be by means of a pipeline dredge, but a hopper dredge may be used. The pipeline would run adjacent to the groins and parallel with the beach. Beach compatible material (sand) from off-shore sources (see Figure 4) would be pumped along the 7,500 linear feet reach of the project and would be discharged as a slurry to the design elevation, backed by a slightly elevated protective dune (see Figure 3). Temporary training dikes of sand would be used to contain the discharge and control the fill placement. Fill sections will be graded by land based equipment, such as bulldozers and articulated front-end loaders, and other equipment as necessary. Equipment will be selected based on whatever

proves to be the most advantageous economically, as well as what generates only minimal and acceptable temporary environmental impacts. The sand will then be graded, raked, and tilled as necessary in coordination with recommendations and requirements from regulatory agencies. To minimize impacts to sea turtles, fish, and shellfish, and infauna, we plan to perform all work between October 15 and April 15; however, funding or other constraints may prevent us from achieving this goal. If any construction activities are performed outside this “window”, precautions will be followed as outlined in Section IV. D., while coordinating with the US FWL Service, NMFS, and SCDNR. It is anticipated construction will take 4 to 5 months, including mobilization.

II. ALTERNATIVES TO THE PROPOSED ACTION

Several alternatives were considered during this study to provide for storm damage protection and offset historic beach erosion rates. A number of structural and non-structural measures were evaluated, along with a “No Action Plan”. Because of the difficulty in locating suitable sources of sand in the study area, a considerable amount of effort was concentrated in locating suitable offshore borrow areas. Several studies involving offshore sub-bottom profiling, side-scan sonar surveys, and vibrocore sampling were conducted, and now adequate offshore borrow areas have been located and have been recommended for use during construction of this project. These alternatives include the following:

A. Relocate Structures. An alternative that considered relocating structures along the Southern Reach of the study area was investigated early in the feasibility phase. It was eliminated based on the lack of available setback distance between the existing locations of the structures within the 200-foot width of the Southern Reach. This prevented considering structure relocation within the existing property lines. Additionally, existing utilities and Springs Avenue, the primary access road through the Southern Reach, are located between the existing structures and Pawleys Inlet Creek located behind the Pawleys Island. Since Pawleys Island is also nearly fully developed, there are no other readily available parcels of land to relocate the structures to.

B. Sea walls, Revetments, etc. The use of sea walls, revetments, and other erosion control structures was considered as an alternative and eliminated from further consideration. The South Carolina Beachfront Management Act specifically prohibits the use of these types of such sand retaining and erosion control structures.

C. Protective Berms. Alternative plans were developed based on initial placement volumes designed to create six possible protective berms (widths of 25-foot, 50-foot, 75-foot, 100-foot, 125-foot, and 150-foot) along the existing shoreline through the Southern Reach. These volumes represent the amount of fill required to be placed to create the protective berm for each alternative and to offset losses due to both background erosion losses due to the average annual erosion rate and stabilization and adjustment of the profile. Two of these alternatives, the 125-foot and 150-foot wide protective berms, were eliminated from further consideration based on comparative analysis with existing beach renourishment projects in the vicinity of Pawleys Island. Each of the remaining four protective berm alternative plans was economically analyzed to identify the most cost effective plan. The 50-foot wide protective berm was identified as the alternative that maximized the net benefits at the least cost. Each of

the base protective berm alternatives was also supplemented by a series of advance nourishment volumes placed seaward of the protective berm. These advance nourishment volumes were selected to support a range of expected nourishment cycles from 6 years to 14 years. Once the plan was selected, that alternative was economically analyzed through the 50-year project life to optimize the plan for a specific periodic nourishment cycle. Based on the economic analysis, the optimized plan is the 50-foot wide protective berm with advance nourishment placed to support a 9-year periodic nourishment cycle.

D. Protective Berms with a Groin at the South End. Additional engineering analysis of the alternatives in paragraph II. C above indicated that each alternative would be subjected to end losses at the south end of the protective berm. To offset the end losses from each alternative, a 200 to 300 foot groin that would be located adjacent to the south end of the south parking lot was evaluated. Economic analysis of the with-groin protective berms did not change the selection of the optimized plan, however, coastal consistency and CBRA issues with this alternative caused it to be eliminated.

E. No Action. As part of the formulation process, a “no action” alternative was examined to identify how the study area would respond if no Federal action were taken to offset the current erosion trends. For Pawleys Island, it is likely that erosion damages along the Central and Northern Reaches will continue to be relatively low due to the existing setback and dune elevation between the coastline and the existing structures. The stability and integrity of the north terminal groin will continue to play an important role in the condition of these reaches. For the Southern Reach, however, the existing structures are not protected by any significant dune elevation or setback. Erosion damages along this reach will likely remain relatively high, removing sand and undermining existing structures until such time that the local Sponsor is forced by conditions to nourish this reach on their own.

III. EXISTING ENVIRONMENTAL SETTING

A. General. The study area encompasses approximately 3.5 miles of South Carolina’s coastline and it’s environs from Midway Inlet to the north and Pawleys Inlet to the south. This coastal barrier Island varies in width from 300 feet at the south end to 1200 feet at the north end. The study area also extends oceanward to the 3-mile limit in order to locate adequate sources of sand for borrow material. This straight to gently curving shoreline, bordered by the Atlantic Ocean, is oriented in a northeast-southwest direction. On the basis of geomorphology, it is classified as an arcuate strand, characterized by wide, flat beaches and breached by few tidal inlets. The average elevation of Pawleys Island is about 8 feet MSL; however, dune elevation in some areas reaches 20 feet MSL. The southern portion of Pawleys Island is low-lying, with little or no sand dunes, and has historically been an area of gradual erosion. The central portion of the island has some of the highest dunes in the state, while the northern end of the island has a wide field of low dunes and has experienced alternating erosion and accretion. A large, intermittently broken foredune range characterizes the seaward side of Pawleys Island.

The beaches at Pawleys Island are located within a dynamic coastal system that is predominantly affected by tides, winds, and storms (i.e. northeasters, tropical storms, and hurricanes). Hurricanes have in the past caused breaches across the southern portion of the

island and resultant damage to properties, roadways, utilities, and public access to the beaches on the island. The estimated overall annual erosion rate at Pawleys Island is approximately 1.3 feet/year, even though there is an extensive groin system in place along its oceanfront.

B. Tides. At Pawleys Island, the mean tide range is from 0.20 feet to 5.17 feet with a maximum tide range of 5.54 feet. Some of the highest observed storm tides in the area were produced by Hurricane Hazel on 15 October 1954, when the storm tide reached 11.5 feet above mean sea level (Hurricane Survey Interim Report, Pawleys Island, South Carolina, September 1961). In addition, Hurricane Hugo produced a storm surge of about 13 feet above mean sea level (Natural Disasters Studies, Hurricane Hugo, National Research Council, 1994).

C. Water Quality. Ocean waters in the study area are generally considered to be of high quality and are used for numerous water oriented activities such as swimming and fishing. Salinity is almost identical to that of the open ocean due to a general lack of freshwater inflow.

D. Climate. The climate of coastal South Carolina is mild and temperate. The average temperatures vary from 56° F in the winter to 91+° F in the summer. The area's severest weather comes in the form of violent thunderstorms, tornadoes, and hurricanes. Most tornadoes occur from March through June, with April being the peak month. The hurricane season extends from June to November, producing infrequent storms, which affect the study area. Rainfall averages nearly 42 inches annually, with the heaviest occurring in the late summer and early fall months. The highest precipitation occurs during the months of April, July, August, September, October, and December with August and October being the peak months. Measurable snowfall may occur one to three times in winter, from November through March. (Source: Myrtle Beach Area Chamber of Commerce, The Grand Strand Climate: Statistics (area stretches from Little River to Pawleys Island) <http://www.mbchamber.com/titlepage.html>).

E. Threatened and Endangered Species. The following are Federally listed species (U.S. Fish and Wildlife Service Listing, dated October 01, 2003 and National Marine Fisheries Service listing of December 30, 2003) that have the potential for occurring or possibly occurring at the proposed project site:

- E - Federally Endangered
- T - Federally Threatened
- P - Proposed in the Federal Register
- CH - Critical Habitat
- C - The U.S. Fish and Wildlife Service or the National Marine Fisheries Service has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
- S/A - Federally protected due to similarity of appearance to a listed species
- SC - Federal species of concern. These species are rare or limited in distribution but are not currently legally protected under the Endangered Species Act.
- * - Contact the National Marine Fisheries Service for more information on this species

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated continually and may be different from the following.

Georgetown County	Status	Certainty of occurrence
Red-cockaded woodpecker (<u>Picoides borealis</u>)	E	Known
Wood stork (<u>Mycteria americana</u>)	E	Known
Bald eagle (<u>Haliaeetus leucocephalus</u>)	T	Known
Piping plover (<u>Charadrius melodus</u>)	T, CH	Known
West Indian manatee (<u>Trichechus manutus</u>)	E	Known
Blue whale (<u>Balaenoptera musculus</u>)*	E	Known
Finback whale (<u>Balaenoptera physalus</u>)*	E	Known
Humpback whale (<u>Megaptera novaeangliae</u>)*	E	Known
Northern right whale (<u>Eubaleana glacialis</u>)*	E	Known
Sei whale (<u>Balaenoptera borealis</u>)*	E	Known
Sperm whale (<u>Physeter macrocephalus</u>)*	E	Known
Kemp's ridley sea turtle (<u>Lepidochelys kempii</u>)*	E	Known
Leatherback sea turtle (<u>Dermochelys coriacea</u>)*	E	Known
Loggerhead sea turtle (<u>Caretta caretta</u>)*	T	Known
Green sea turtle (<u>Chelonia mydas</u>)*	T	Known
Hawksbill sea turtle (<u>Eretmochelys imbricata</u>)*	E	Known
Shortnose sturgeon (<u>Acipenser brevirostrum</u>)*	E	Known
Pondberry (<u>Lindera melissifolia</u>)	E	Possible
Canby's dropwort (<u>Oxypolis canbyi</u>)	E	Possible
Chaffseed (<u>Schwalbea americana</u>)	E	Possible
Sea-beach amaranth (<u>Amaranthus pumilus</u>)	T	Known
Dusky shark (<u>Carcharhinus obscurus</u>)*	C	Possible
Sand tiger shark (<u>Odontaspis taurus</u>)*	C	Possible
Night shark (<u>Carcharhinus signatus</u>)*	C	Possible
Speckled hind (<u>Epinephelus drummondhayi</u>)*	C	Possible
Warsaw grouper (<u>E. nigritus</u>)*	C	Possible
Atlantic sturgeon (<u>Acipenser oxyrhynchus oxyrhynchus</u>)*	C	Possible
Swallow-tailed kite (<u>Elanoides forficatus forficatus</u>)	SC	Known
Bachman's sparrow (<u>Aimophia aestivalis</u>)	SC	Known
Henslow's sparrow (<u>Ammodramus henslowii</u>)	SC	Known
Red knot (<u>Calidris canutus</u>)	SC	Possible
Black-throated green warbler (<u>Dendroica virens</u>)	SC	Possible
American kestrel (<u>Falco sparverius</u>)	SC	Possible
American oystercatcher (<u>Haematopus palliatus</u>)	SC	Known

Loggerhead shrike (<u>Lanius ludovicianus</u>)	SC	Possible
Black rail (<u>Laterallus jamaicensis</u>)	SC	Possible
Swainson's warbler (<u>Limnothlypis swainsonii</u>)	SC	Known
Painted bunting (<u>Passerina ciris ciris</u>)	SC	Possible
Gull-billed tern (<u>Sterna nilotica</u>)	SC	Known
Rafinesque's big-eared bat (<u>Corynorhinus rafinesquii</u>)	SC	Known
Southern Dusky Salamander (<u>Desmognathus auriculatus</u>)	SC	Possible
Southern hognose snake (<u>Heterodon simus</u>)	SC	Possible
Pine or Gopher snake (<u>Pituophis melanoleucus melanoleucus</u>)	SC	Known
Georgia lead-plant (<u>Amorpha georgiana var. georgiana</u>)	SC	Known
Awned meadowbeauty (<u>Rhexia aristosa</u>)	SC	Known
Carolina pygmy sunfish (<u>Elassoma boehlkei</u>)	SC	Known
Known		
Carolina grass-of-parnassus (<u>Parnassia caroliniana</u>)	SC	Known
Dune bluecurls (<u>Trichostema sp 1</u>)	SC	Known
One-flower balduina (<u>Balduina uniflora</u>)	SC	Known
Pineland plantain (<u>Plantago sparsiflora</u>)	SC	Known
Pondspice (<u>Litsea aestivalis</u>)	SC	Known
Carolina bogmint (<u>Macbridea caroliniana</u>)	SC	Known
Savannah or Piedmont cowbane (<u>Oxypolis ternata</u>)	SC	Known
Reclined meadow-rue (<u>Thalictrum subrotundum</u>)	SC	Known
Wire-leaved dropseed (<u>Sporobolus teretifolius</u>)	SC	Known
Venus' fly-trap (<u>Dionaea muscipula</u>)	SC	Known
Southern bog-button (<u>Lachnocaulon beyrichianum</u>)	SC	Known

Species proposed for listing: None

Designated Critical Habitat: None in the area of this project, however there is designated piping plover habitat adjacent to and north of the island (see Figure 5)

The U.S. Fish and Wildlife Service has designated critical habitat under the Endangered Species Act of 1973, as amended (Act), for the piping plover (*Charadrius melodus*) on breeding grounds in the Great Lakes and Northern Great Plains Regions, and in the wintering grounds along the coasts of North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Texas. This designation results in additional review requirements under section 7 of the Act.

Green turtles are listed as threatened, except for breeding populations of green turtles in Florida and on the Pacific Coast of Mexico, which are listed as endangered.

Candidate species are not protected under the Endangered Species Act, but concerns about their status indicate that they may warrant listing in the future. Federal agencies and the public are encouraged to consider these species during project planning so that future listings may be avoided.

F. Biological Resources. A large and varied number of species of invertebrates, fishes,

and birds, as well as mammals and reptiles, utilize the habitats in and around Pawleys Island. The threatened loggerhead turtle utilizes both the beaches of Pawleys Island for nesting and the shallow, ridged shoals of Midway Inlet for feeding and resting between nesting efforts.

1. General: As a result of extensive development, the primary terrestrial habitat in the immediate study area consists of residential and some commercial facilities. Vegetative cover in the area varies from sparse remnants of previous vegetation in areas that have been severely altered or eroded to a slightly more natural condition at the north end where there is some accretion. Many species are displaced when development occurs while other, more urbanized species continue to prosper in this environment. Other habitats in the study area include the beach and near shore ocean, and some limited dunes and shrub thickets.

In most areas along the South Carolina coast, beaches are gently sloping transitional areas between open water and upland communities. These communities typically consist of a dry berm zone located beyond the high tide zone, an intertidal zone that is alternately covered and exposed by tidal action, and a subtidal zone that occurs below the low tide line and extends seaward. In the specific project area, the dry beach berm has, for the most part, been severely eroded and the intertidal areas are narrower due to the extensive development and beach erosion. Patchy areas of live bottom habitat occur in the subtidal zone adjacent to the proposed borrow areas.

2. Fish and Wildlife: Relatively few species inhabit sandy beaches, but of those that are present, many frequently occur in large numbers. Typical inhabitants are beach fleas (*Orchestia aqilis*) and ghost crabs (*Ocypode albicans*) in the beach berm; coquina (*Donax variabilis*), mole crabs (*Emerita talpoidea*), amphipods and various burrowing worms in the beach intertidal zone; and blue crabs, horse-shoe crabs, sand dollars, and a variety of clams and gastropod mollusks in the beach subtidal areas. In addition, many species of fish commonly occur in the surf zone and deeper nearshore waters. The Atlantic silverside (*Menidia menidia*), bay anchovy (*Anchoa mitchili*), spot (*Leiostomus xanthurus*), bluefish (*Pomatomus saltatrix*), mullet (*Mugil cephalus*), king fish (*Menticirrhus saxatilis*), red drum (*Sciaenops ocellata*), flounder (*Paralichthys sp.*), and seatrout (*Cynoscion nebulosus*) are the most common. Although the beach zone is utilized by many species of wading and shore birds along much of the South Carolina coast, most of the project area provides somewhat less than ideal habitat for these species because of extensive development, public use, and severe erosion problems.

Much of the dune system is totally lacking along much of the island, due to extensive development and erosion. Few plant species can tolerate the harsh dune environment of sediment instability, salt spray, and periodic salt water overwash. As a result, vegetative cover generally consists of perennial grasses such as sea oats (*Uniola paniculata*), and salt tolerant grasses. Because of a general lack of vegetative cover, wildlife usage is limited to small birds, ghost crabs, reptiles and amphibians, and insects.

3. Offshore Borrow Sites. The area near the offshore ocean borrow sites (see Figure

4) are subtidal and defined by two distinct bottom characteristics; hard bottom and sand bottom. Animals commonly found on the near beach ocean bottom are: sponges, corals, hydroids, bryozoans and ascidians as well as certain anemones, sessile polychaetes, and some arthropods. Most of these animals require hard substratum for attachment. Polychaetes, amphipods, oligochaetes, pelecypods, and decapods represent, among other taxa, the major infaunal assemblages inhabiting sand bottom.

G. Cultural, Archaeological and Historical Resources. There are 454 single-family residences, 23 of which are located in the central portion of the island (identified as the Pawleys Island Historical District). These 23 residences have been identified by the State Historic Preservation Officer as significant historical sites, 10 of which are registered historic residences built between the mid-1700's and mid-1800's. To escape the heat and malaria of their mainland plantations, the rice royalty used to move their families to cottages on Pawleys Island for the summer. Some of these cottages are still in use and nine of them are part of this Historic District. The historical identification further states that the shoreline and marshland in this area have been included in the historical district boundaries as an integral part of the district both historically and geographically.

In addition, the South Carolina Institute of Archaeology and Anthropology (SCIAA) has pointed out, via letter of March 28, 2003, that there is a possibility of shipwrecks residing in the proposed borrow areas. Similar concerns were expressed by the State Historic Preservation Office (SHPO) on March 31, 2003. These areas will be surveyed for the presence of any significant cultural resources during the design phase of this study process.

One of the more colorful aspects of island life is embodied in the appearances of the Gray Man of Pawleys Island. There have been many testimonies that the apparition appears before major storms to warn the island's inhabitants of approaching danger from hurricanes.

H. Socio-economic. The study area associated with Pawleys Island is located in Georgetown County South Carolina. Georgetown County covers 815 square miles and the population of the county area estimated for the year 2000 is 55,797, an increase of around 18 percent over the 1990 population. Pawleys Island, by contrast had 138 year round residents in 2000. The two major population centers for the county are the City of Georgetown and the Town of Andrews, but the County is predominantly rural. Employment in Georgetown County is diversified with manufacturing employing 6,117 people, followed by 4,296 in the wholesale and retail trade, and 8,218 in the service industry. The per capita personal income (1999) for Georgetown County averages \$21,892 as compared with the per capita income of \$23,538 for the State of South Carolina and \$28,546 for the Nation. Because of its small population, there is no specific per capita income information for Pawleys Island.

I. Aesthetics and Noise. The aesthetics and noise levels of the Pawleys Island area are comparable to those of any other barrier island that is both a tourist destination point as well as year-round residences. The noise levels are generally limited to local auto and truck traffic serving the community as well as boating traffic and recreators at play.

J. Hazardous and Toxic Waste. There are no known hazardous or toxic waste sites located in the vicinity of this project.

K. Air Quality. Air quality in South Carolina is measured and regulated by the South Carolina Department of Health and Environmental Control. At the present time, the State of South Carolina, including the Georgetown County area, is in attainment with National Ambient Air Quality Standards.

IV. PROBABLE IMPACTS OF THE PROPOSED ACTION

A. Physical. The proposed physical changes to the existing ecosystem include the placement of sand between the system of groins from Groin #1 (adjacent to the public beach area) to Groin #12 groin, that will provide the maximum level of protection to the south end of the island for the dollars invested, along with an optimum re-nourishment cycle for future maintenance requirements. This will, in addition to protecting structures, provide a more suitable environment for sea turtle nesting and possible re-colonization of the endangered Sea-beach amaranth. There will be temporary disturbances of the sediments in the off-shore borrow areas, but it will be short lived, terminating upon completion of the project.

B. Water Quality. There will be short-term adverse water quality impacts during the construction period of this project. Dredging the proposed borrow areas will generate turbidity and sedimentation impacts within the immediate vicinity of the operation, but the generally large grain size of the material will keep the area of impact small and will ensure that there are no impacts beyond the period of construction. Fine-grained soils (silt sizes) will constitute an average of 5 percent by weight of the total material placed on the beach. The average grain size diameter will likely be on the order of 0.25 mm or greater. So, turbidity due to suspended silt should be minor and localized to the vicinity of the cutter head or drag head. The period of construction will be approximately 4 to 5 months and similar short-term water quality impacts will occur at the deposition sites along the 7,500-foot project length. Fill operations will deliver a slurry of sand to the receiving shore, increasing turbidity in the immediate area. This effect, however, will not be significant since turbidity levels in the high-energy surf area are naturally high. Depths below the existing grade at the borrow sites will range from 1 to 8 feet. Because of this, there is not expected to be any long-term decrease in water quality at these sites. Periodic beach nourishment, which is expected to be required every 9 years, will have water quality impacts similar to those for initial construction. A Water Quality Certification was received from the South Carolina Department of Health and Environmental Control on June 25, 2003.

C. Climate. No changes in climate will occur as a result of this project.

D. Threatened and Endangered Species.

General Biological Assessment Of The Effect On Threatened And Endangered Species.

The placement of sand on the beach at Pawleys Island has the potential to primarily affect nesting loggerhead sea turtles or emerging loggerhead sea turtle hatchlings. To minimize the effects to sea turtles the following precautions will be followed:

1. If construction of the restored beach and dune system occurs during the period between May 1st and November 30th, daily nesting surveys will be conducted starting

either May 1st or 65 days prior to the start of construction, whichever is later. These surveys will be performed between sunrise and 9:00 AM and will continue until the end of the project, or September 30th, whichever is earlier. Any nests found in the area that will be impacted by construction activities will be moved to a safe location. The nesting surveys will be performed by people trained in the identification of turtle tracks and nest sites. Nest relocations will only be performed by people with a valid South Carolina DNR permit.

2. If construction of the restored beach and dune system occurs during the period December 1st to April 30th, no nesting surveys will be performed.
3. For construction activities occurring during the period May 1st through November 30th, staging areas for equipment and supplies will be located off of the beach to the maximum extent possible.
4. For construction activities occurring during the period May 1st through November 30th, all on-beach lighting associated with the project will be limited to the minimum amount necessary around active construction areas to satisfy OSHA requirements.
5. Immediately after completion of the project, the Corps of Engineers will perform compaction testing of the newly constructed sand berm. This compaction testing will be repeated for 3 subsequent years, prior to May 1st of each year.

Adherence to the above precautions should minimize the effects to nesting loggerhead sea turtles and emerging loggerhead sea turtle hatchlings. However, negative impacts still may occur; therefore, the Corps of Engineers has concluded that the storm damage protection project may adversely affect the loggerhead sea turtle.

Other threatened or endangered species listed for Georgetown County that would be expected to occur in the project area include the West Indian manatee, Piping plover, Kemp's ridley sea turtle, Leatherback sea turtle, Green sea turtle, and Shortnose sturgeon.

There are no reported sightings of Piping plover on Pawleys Island and there is no designated Piping plover critical habitat within the impacted area. Therefore, the Corps of Engineers has determined that the proposed project is not likely to adversely affect the Piping plover.

The Loggerhead sea turtle is considered to be the only sea turtle species likely to nest in the project area. Therefore, the proposed project is not likely to adversely affect the Kemp's ridley sea turtle, Leatherback sea turtle, or Green sea turtle.

The West Indian manatee is an uncommon summer resident of the South Carolina coast. To ensure the protection of any manatees that may be present, personnel associated with the project will be instructed about the possible presence of manatees and the need to avoid them with vessels and other equipment. For these reasons, it has been determined that the proposed project is not likely to adversely affect the West Indian manatee.

Because the edge of the sand source for this project is located at least 1 mile off-shore and up to 30 feet deep at the outside perimeter, it is unlikely that Shortnose sturgeon occur in the immediate project area. Sturgeons tend to collect in the deeper parts of existing channels and inlets, but disperse widely in the open ocean. For this reason, it has been determined that the proposed project is not likely to adversely affect the Shortnose sturgeon.

Formal Biological Assessment Of The Effect On Threatened And Endangered Species.

A formal Biological Assessment for this project was prepared in March 2003 and provided to the US Fish and Wildlife Service for review and concurrence. The summary effect determination from that report for the threatened and endangered species which are known to or could occur in the areas of Georgetown County is included as an attachment to this EA, but the summary is as follows:

This assessment has examined the potential impacts of the proposed project on the habitat and listed species of plants and animals that are, or have been, present in the project area. Both primary and secondary impacts to habitat have been considered. Critical habitat has not been designated for whales, manatees, sea turtles, sturgeon, or seabeach amaranth in South Carolina; therefore, none would be affected. The USFWS designated critical habitat for the wintering piping plover is adjacent and to the north of the island, but not on the island. Based on this analysis, the following determinations have been made.

- It has been determined that the proposed project is not likely to adversely affect the blue (NMFS list), finback, humpback, right, sei, or sperm whales.
- It has been determined that the proposed project is not likely to adversely affect the manatee.
- It has been determined that the proposed project is not likely to adversely affect Kemp's ridley, leatherback, green, or hawksbill sea turtles.
- It has been determined that the proposed project is not likely to adversely affect the shortnose sturgeon.
- It has been determined that the proposed project is not likely to adversely affect the piping plover.
- It has been determined that the proposed project is not likely to adversely modify proposed critical habitat for the wintering piping plover.
- It has been determined that the proposed project may adversely affect the nesting loggerhead sea turtle.
- It has been determined that the proposed project may adversely affect the seabeach amaranth.
- In a letter dated August 12, 2003, the U.S. Fish and Wildlife Service concurred with these determinations (see Appendix K).

E. Biological Resources. The expected outputs of the proposed storm damage protection project, in addition to a higher level of protection for the Island structures, include a more suitable beach for sea turtle nesting, more beach area for the potential establishment of

the sea beach amaranth, and potential foraging, sheltering, and roosting area for the Piping Plover.

1. General: The proposed sandfill operation on the project beaches will cover an area of the shore and nearshore. The fill will extend to a maximum of approximately 12 feet below NGVD29 (which is also close to 12 feet below Mean Tide Level) with a deposit of sand for 7,500 foot project length. Approximately 10% to 15% of this area (or 25 acres) of beach fill will be raised from tidal or subtidal elevations to above the level of mean high water. The tidal zone will be displaced offshore from its present location and will experience no net loss in total area. In some areas of Pawleys Island where there is little existing beach at high tide, the project will provide an increase in high tide beach area as the tidal zone is pushed offshore from the face of sea walls to a more gradual sandy beach slope. The increase in beach and beach slope will result in a temporary loss of shallow near-shore (Littoral) zone until a new equilibrium is established.

The temporary loss of (Littoral) zone area will mean a direct reduction in habitat for benthic marine invertebrates. This loss is negligible in view of the vast amount of existing near-shore area available. The loss of benthic marine invertebrates which currently inhabit the near-shore will be a short-term impact, since the new sand bottom will begin to be re-colonized shortly after construction ceases and re-colonization should be complete within three-to-six months following beach nourishment. Tidal zone species will eventually have an area of habitat equivalent to that at present. Nourishment materials will be clean sand having a grain size similar to that of the existing beach and should be rapidly re-colonized following completion of initial nourishment and periodic nourishment. Since animals associated with high-energy beaches are continually subjected to effects of erosion and accretion and major physical changes resulting from storms and hurricanes, which in many cases are much more severe and widespread than the effects of the proposed nourishment project, initial construction and periodic nourishment will not unduly stress beach and inter-tidal fauna beyond their adaptive capabilities. Any adverse effects are short-term in nature, and it must be recognized that most of this shoreline reach has been eroded to the point that it provides less than ideal habitat for many of the species of concern. We, therefore, feel that the long-term benefits to be derived from providing a more stable beach environment far outweigh short-term adverse impacts, which may result from placement of nourishment materials.

2. Plant Life: The placement of additional sand on the beach will stop the current destruction of the current plant life of the beach and dune environment on the southern end of the island, and it will delay impacts to the balance of the island for as long as the project is maintained. The new protective dunes will also provide an opportunity for dune species to flourish, such as sea oats, sea ox-eye, glasswort, and other species. Following construction, grassing of the dunes will expedite the vegetative recovery and these plants should increase in number and flourish to a greater extent than before.

3. Fish and Wildlife: The effects of the beach nourishment project on population

levels of the coquina clam, mole crabs, and other invertebrate species inhabiting the beach intertidal zone will result in temporary adverse impacts to these organisms. These animals are important members of the food chain because they are preyed upon by a variety of commercially and recreationally important fish species and shore birds. There are no anticipated long term impacts, however, and numbers should quickly return to normal.

Fish and bird species can easily move out of the way and will return to the area when construction work is completed. Most terrestrial species will not be impacted beyond the noise levels. Noise impacts will cease when the construction is completed.

4. **Offshore Borrow Sites:** The District will conduct the customary detailed post-dredging assessment of bathymetry and biological characteristics in the borrow area, even though deep depressions will not be made. The rationale for this is that due to the large volume of sand required for this effort being drawn from a broad area(s), and the fact that there may be another cycle of dredging in the future, it was determined by the National Marine Fisheries Service that the detailed post-dredging assessment should be implemented. Monitoring of sand borrow sites is normally conducted to determine recovery rates and ecological characteristics.

F. Cultural, Archaeological and Historical Resources. It is anticipated that there will be no properties included in or eligible for inclusion in the National Register of Historic Places that will be negatively affected by the proposed project. The 23 structures in the Pawleys Island Historical District, described in paragraph III. G. above, should not receive either a greater or lesser level of protection from storms following completion of the proposed work.

In accordance with information provided by SHPO on March 31, 2003, coordination with SHPO concerning possible submerged cultural resources will continue until SHPO's concerns have been resolved (see Appendix G).

G. Socio-economic. Major socio-economic changes are not expected to result from the construction of this project. There should, however, be a positive impact on tourism with the creation of a wider all-tide beach.

H. Aesthetics and Noise. During the construction phase of this project, there will be a general increase in the ambient noise level. Operating dredges are generally quiet and contribute less to ambient noise levels than normal motor and speedboat traffic; and offshore pumps are not expected to impact the ambient noise level, as they will be far enough removed from the beach not to be heard very well. Bulldozers, however, will be working on the beach around the clock and may impact adversely the ambient noise level in their immediate vicinity. The bulldozers will be muffled though and impacts will be restricted to the immediate construction reach. In addition, the noise level and the visual impact of the project will be temporary and shift along the project reach as portions are completed and the equipment moves up or down the shoreline.

Visual and aesthetic features include the Atlantic Ocean and a narrow beach along much of the project length. Currently, there is very little evidence of a dune system along the

project length. A slight increase in the berm height will not reduce the ocean view. Conversely, the nourishment project will provide an attractive and usable all-tide beach. Temporary degradation of aesthetics will occur on the beach during sand placement and movement.

The noise and visual impacts will return to normal levels following project completion.

I. Hazardous and Toxic Waste. There are no known hazardous or toxic waste sites located in the vicinity of this project, so there will be no impacts.

J. Air Quality. Air pollution derived from the dredge and other construction equipment should be negligible during both initial construction and any future periodic nourishment of the project. It is reasonable to assume that any impacts from the equipment use would be localized and of relatively short duration, quickly reverting to normal following project completion. Coastal winds prevent the buildup of automobile, boat, and construction produced air pollutants.

K. Environmental Justice. Executive Order 12898 requires Federal agencies to develop a strategy for its programs, policies, and activities to avoid disproportionately high and adverse impacts on minority and low income populations with respect to human health and the environment. The US Army Corps of Engineers is committed to the principles of environmental justice. Although the coastal side of the Town of Pawleys Island is the project, all long-term impacts should be of a positive nature and benefit the residents and visitors with greater recreational opportunities and a higher level of storm protection.

L. Essential Fish Habitat. The content of this section was coordinated with National Marine Fisheries Service representative Prescott Brownell during November and December of 2002. The release of Public Notice 2003-1R-071 initiated the Essential Fish Habitat (EFH) consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act. Our current determination is that the proposed action would not have a substantial individual or cumulative adverse impact on EFH or fisheries managed by the South Atlantic Fishery Management Council and the NMFS.

EFH Assessment

1) Description of the site: Pawleys Island is a coastal barrier island, characteristic of the sea island coastal region of South Carolina and Georgia, and is surrounded by sensitive coastal marine and estuarine habitats. Coastal barrier beaches, near-shore waters, inlets, and associated estuarine tidal wetlands provide high quality feeding, cover, spawning, and maturation sites for a variety of living marine resources. As such any component of the project that may directly or indirectly reduce the quality, aerial extent, or natural character of the habitats involved should be identified. The project site is located in areas identified as Essential Fish Habitat (EFH) in the 1998 Amendment to Fishery Management Plans (FMP) that was prepared by the South Atlantic Fishery Management Council (SAFMC). This Amendment was prepared in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1996 (P.L. 94-265) and was approved by the Secretary of Commerce on June 3, 1999. Detailed information regarding EFH and species managed by the

SAFMC can be found in the amended FMPs. EFH at the project site includes estuarine and coastal marine unconsolidated sand/mud bottoms, inter-tidal flats, emergent wetlands, and marine and estuarine water column. (This description was furnished by NMFS)

2) The primary borrow area for this project is a large area covering 1.3 square miles to the SE off the coast of Pawleys Island (see Figure 4). It starts roughly at the 30-foot contour and is bounded to the east by the 3-mile line and to the west by the “M03” CBRA Zone. It has been surveyed by side-scan sonar, followed by the taking of numerous Vibracore samples in both potential borrow sites. This was done in order to avoid hard bottom areas during dredging, and adequate depths of sand were found to be in the core of the two areas. In addition to our own internal review where we looked for shallow depth of borings (hard bottom), deep sand deposits, and the presence of organic materials in the sample, the SC DNR also reviewed the reports and findings and helped to outline those areas that should be avoided. Because of the dynamic nature of the coastal area and the constant movement of sand, it is expected that the borrow area will fill with sand of the same grain size after the pumping has been completed.

The secondary borrow area for this project is a 0.5 square mile area located between Pawleys Island and the primary borrow area. It starts about 1 mile from the shoreline and extends out to the 30-foot contour and is bounded to the south by the “M03” CBRA Zone (see Figure 4). It has been surveyed in order to avoid hard bottom but deposits of usable sand are typically only a few feet deep. Because of the shallow depth, depressions will not be created if the sand must be pumped to the beach. Due to the shallow nature of the deposits, and because of the dynamic nature of the coastal area and the constant movement of sand, it is also expected that this potential borrow area will fill with sand of the same grain size. The same type of survey work was done on this site and the SC DNR also helped to eliminate those areas that might contain live bottom.

Both borrow area acreages have been adjusted to match the amount of suitable sand depth. Larger areas had been evaluated but the above listed acreages are what remained after the Corps of Engineers and SC Department of Natural Resources review and evaluation process. Monitoring of sand borrow sites is normally conducted to determine recovery rates and ecological characteristics. The customary detailed post-dredging assessment of bathymetry and biological characteristics in the borrow area will be needed for this project, even though deep depressions will not be made. Due to the large volume of sand required for this effort being drawn from a broad area(s), and the fact that there may be another cycle of dredging in the future, it was determined by the National Marine Fisheries Service that the detailed post-dredging assessment should be implemented.

3) A description of the proposed action is located in Sections I & II above.

4) Analysis of individual and cumulative effects on EFH: Federally managed species associated with the above-mentioned habitats found at the project site include post-larval, juvenile, and adult red drum (Sciaenops ocellata), white shrimp (Litopenaeus setiferus), and brown shrimp (Farfantepenaeus aztecus). Species under jurisdiction of

the Mid Atlantic Fishery Management Council also occur in the project area. These species and their associated EFH include juvenile and adult summer flounder (Paralichthys dentatus) which occur on submerged estuarine bottom and in the water column, and juvenile and adult bluefish (Pomatomus saltatrix) which occur in the water column. The project area also provides nursery and forage habitat for other species including black drum (Pogonias cromis), Atlantic menhaden (Brevoortia tyrannus), and blue crab (Callinectes sapidus) which serve as prey for other species (e.g., mackerels, snappers, and groupers) that are managed by the SAFMC, and for highly migratory species (e.g. billfishes and sharks) that are managed by the NMFS.

Macro invertebrate inhabitants of the near shore coastal zone are important components of coastal marine food webs and serve as prey for the aforementioned Federally managed fishes. Characteristic benthic fauna of southeastern beaches is diverse, including tropically important representatives such as haustoriid amphipods, polychaete worms, isopods, and ghost crab (Ocypode quadrata).

5) Charleston District's views regarding effects: Based on project reviews provided by the National Marine Fisheries Service and the South Carolina Department of Natural Resources to the Charleston District, significant long-term harm to the ecologically diverse aquatic habitats, such as "live rock" and other stable bottoms are not anticipated. Approximately 25 acres of intertidal beach and 40 acres of subtidal beach zone habitat will be affected by placement of beach quality sand. Although non-motile benthic animals will be adversely affected by placement of sand, re-colonization is expected to be relatively rapid, with re-establishment of the beach zone community within 1-2 years in affected areas.

Areas to be affected by excavation of beach quality sand include up to approximately 1,150 acres. Within sand borrow areas; benthic epifauna and infauna will be impacted by excavation and temporary turbidity that may extend beyond the excavation areas.

The majority of the sand would be drawn from the primary borrow site, which is an approximate 830-acre site (see Figure 4). Sand would be shaved off in layers until the required volumes were met, but the excavation would go no deeper than 5 to 10 feet. If additional material is needed, it will be removed from the approximate 320-acre secondary site. Both areas have been carefully mapped out to avoid live/hard bottom, and no deep depressions will be created in the borrow areas. Upon completion of the work, approximately 65 acres of inter-tidal and sub-tidal zone on the beach will be covered with sand. Materials used for beach nourishment may also be transported by natural processes onto other areas that support benthic communities; however, no hard bottoms or vegetated wetlands will be affected. Other potential impacts include localized turbidity elevation and possible reduction of dissolved oxygen in the surrounding water column. Elevated turbidity can reduce photosynthesis activity of pelagic and benthic algae. Suspended sediments can cause physical damage to respiratory structures of early life history stages of fishes and invertebrates.

The overall magnitude of these impacts are expected to be short term and minor under the dredging operations to be employed, and are as follows: Approximately 830 acres of borrow area will have several feet of sand shaved off the top and transported to the

beach. If the secondary site is utilized then approximately 320 additional acres could be shaved of several feet of sand. This sand would then be transferred to the beach and approximately 65 acres of inter-tidal and sub-tidal zone would be converted to the new beach profile. Although no hard bottoms or vegetated wetlands will be impacted, there will be impacts to the non-mobile benthic organisms in both the borrow areas and beach area. Re-colonization of the beach and borrow area(s) is expected to occur within 1 to 2 years. Turbidity at both the borrow area(s) and the beach area will be short-lived and will clear as soon as the pumping of sand ceases.

6) Proposed mitigation, if applicable: Not applicable in this case.

M. Marine Protected Areas. Executive Order 13158 requires Federal agencies to avoid harm to the natural and cultural resources that are protected by a Marine Protected Area (MPA) to the extent permitted by law and to the maximum extent practicable when their actions affect those resources that are protected. It is not anticipated that there will be any impacts to MPA's as a result of this proposed project.

N. Cumulative Impacts. The cumulative impacts of the proposed project will be to provide improved and longer-term hurricane damage protection for the dwellings and infrastructure of Pawleys Island. In addition, these improved beach conditions, with a more extensive dune development, will increase the area for use by the general public while providing a valuable habitat for the loggerhead turtle (and most likely incidentally, the Wilson's plover and least tern). By implementing the proposed project, there will also be the potential for sufficient substrate to provide the potential for natural or deliberate re-establishment of a population of seabach amaranth.

The Southern Reach of Pawleys Island is fully developed; therefore, the proposed project will not result in any increased development on the island.

The possibility that the Town of Pawleys Island will nourish the Central Reach after the proposed project is completed should be considered a cumulative impact. Assuming the same nourishment cross section is constructed (see Figure 3), nourishment of the Central Reach will result in sand placement on approximately 10 acres of existing dry beach, approximately 20 acres of existing intertidal zone, and approximately 35 acres of subtidal zone. The environmental effect of this work is expected to be similar to the effects of the proposed project described in this assessment. If the Town of Pawleys Island decides to perform nourishment of the Central Reach, they will be responsible for obtaining the necessary Federal and state permits and coordinating the work with interested parties.

V. OUTPUTS

A. Measurement of Expected Outputs. In order to obtain an accurate measurement of the outputs of the project, beach profiles will be monitored to determine the required nourishment cycle. Additionally, annual sea turtle nesting numbers will be evaluated to determine if there is a change in nesting numbers or false crawls in the area of the project. Increased counts of Wilson's plover (State listed – threatened) and Least terns (State listed – threatened) will also be monitored, if possible.

B. Importance of Expected Outputs. The importance of the expected outputs of the proposed project needs to be considered in terms of the reduction in future storm damages to the community, an incidental increase in public use, and increased benefits for fish and wildlife.

From the human perspective, the loss of beach area for recreational purposes and destruction to homes and property have a greater and greater effect on the basic quality of life. The reduction of these losses will reverse the current negative impact the permanent residents experience because of more frequent home repairs. Although not a project purpose, the project will also enhance visitor’s use of the area by increasing the amount of available beach and their aesthetic pleasure from being in the area. Finally, the project will increase the economic gain to the island’s tourist industry, while reducing outlays for property repairs.

From a fish and wildlife perspective, the restoration of a protective beach and dune system along the coast of this island should enhance the opportunities for use by the Federally listed Piping plover (T) and state listed Wilson’s plover (T) and Least tern (T). The additional beach area will provide more room for loafing and feeding. There are also occasional visits by Ground doves (under consideration for state listing as threatened) and this work will most likely provide additional habitat for their use. Habitat conditions on South Carolina sea islands and beaches are now critical for this species, and these islands support the largest number of Common Ground Doves in the state.

In addition, opportunities for sea turtle nesting will be increased and it is expected that the number of loggerheads utilizing the area will rise, although the increase is likely to be gradual and realized over a long period of time. If we look at the four years before and the four years after the last nourishment work done in Dec. 1998 to Mar. 1999, there was nearly a 10% increase in the overall nesting on the island, therefore, we can expect that a similar modest increase will occur in the southern study reach. Reference the following table:

Table 1
Total Number of Loggerheads Nesting on the Island from 1991 to 2002

	Entire Island	<u>Known Nesting Origins</u>		
		Area of Corps Project	Island Mid Section	Island Northern Reach
2002	6 Nests	2 Nests	0 Nests	0 Nests
2001	3 Nests	2 Nests	1 Nests	0 Nests
2000	13 Nests	6 Nests	7 Nests	0 Nests
1999	12 Nests	7 Nests	3 Nests	2 Nests
1998	10 Nests	5 Nests	0 Nests	0 Nests
1997	6 Nests	0 Nests	2 Nests	0 Nests
1996	7 Nests	0 Nests	2 Nests	1 Nests
1995	8 Nests	N/A	N/A	N/A
1994	20 Nests	N/A	N/A	N/A
1993	1 Nests	N/A	N/A	N/A

1992	10 Nests	N/A	N/A	N/A
1991	12 Nests	N/A	N/A	N/A
Totals	108 Nests	22 Nests	15 Nests	3 Nests

From 1991 to 2002, the entire length of Pawleys Island had 108 nests, or an average of 9 nests per year overall. All nest location data was not collected from 1991 to 1995, and some additional nests were not located thereafter. There are, however, at least 40 nests clearly marked from 1996 to 2002; and using these numbers as a basis, there are currently an average of 5.7 nests per year. If the whole length of the island were to be protected there would be at least a 10% increase the first year following construction. Statistics for the project reach, however, only show a total of 22 nests out of 40, so the project area would incorporate 55% of the overall increase in nesting activity (or the increase should affect 55% of the islands nesting activity).

Another way to examine the turtle nesting improvements/opportunities is to assess the existing condition beach profiles and compare them to the with-project beach profiles and the projected improvement will provide an additional 25 acres of berm and beach area in the southern reach.

This data assumes an increased berm width through the project area following construction. The improved beach berm should not only improve the success rate for the natural nests currently being laid here, but also should eliminate most false crawls and further raise the number of nests. The approximate existing areas (in acres) of the areas proposed for sand placement are as follows:

- Dry Beach (i.e. above high tide) - approximately 15 acres
- Intertidal - approximately 25 acres
- Subtidal - approximately 40 acres

Upon completion of the project, the acreages of dry beach and intertidal zone will be as shown below. (Note: Due to erosion these acreages will change over time until being restored during periodic nourishments.) The total acreage of subtidal zone will not change; however, the location of this subtidal zone will be shifted seaward approximately 100 feet (see Figure 3).

- Dry Beach - approximately 40 acres
- Intertidal - approximately 15 acres

If the net improvement is then incrementally analyzed to support a determination of Federal interest, it can show a significant value. This procedure would be consistent with work done by the Corps of Engineers, Wilmington District at Long Beach, NC for a Section 1135 study (i.e., ecosystem restoration study) to support turtle nesting, in which they realized a net output of 27.5 acres of suitable nesting habitat at a cost of \$9,823,000, or \$357,200/acre. That could reflect a benefit of about \$8,500,000, however, we don't need these benefits to justify Federal interest.

Sea-beach amaranth is a threatened species that could benefit from this nourishment effort. This plant has disappeared from most of the islands along the coast of South Carolina.

However, with the additional dune area created in the more southern portion of the Island, state resource agencies could re-introduce cuttings into the dune environment and they would have an opportunity to re-colonize a portion of the island (see Figure 6).

VI. UNAVOIDABLE ADVERSE ENVIRONMENTAL CONSEQUENCES

Adverse environmental impacts associated with this project are as follows:

1. There would be a temporary increase in noise and air pollution during the construction phase of this project.
2. A temporary increase in turbidity during construction may occur.
3. Organisms utilizing the construction areas will be displaced by the project.

VII. CONCLUSIONS

The proposed action does not constitute a major Federal action significantly affecting the quality of the human environment; therefore, the preparation of an Environmental Impact Statement (EIS) provided for under Section 102(c) of the National Environmental Policy Act of 1969 is not required.

VIII. FEDERAL, STATE, AND LOCAL AGENCY COORDINATION

A list of agencies with which this report is being coordinated as well as pertinent correspondence, is contained in the Appendices.

IX. FINDING OF NO SIGNIFICANT IMPACT FOR THE PAWLEYS ISLAND GENERAL INVESTIGATION STUDY OF STORM DAMAGE PROTECTION GEORGETOWN COUNTY, SOUTH CAROLINA

Based on the attached Environmental Assessment and a consideration of other pertinent documents, I conclude that the environmental effects of the proposed hurricane damage protection GI study along the 7,500-foot long southern reach of Pawleys Island, from groin #12 south to the southern terminal groin, where continued erosion is threatening the structural integrity of many dwellings, are not significant and the preparation of an Environmental Impact Statement is not warranted. Specific factors considered in making the determination include the following:

- a. Water quality would not be affected.
- b. Wetlands would not be adversely affected, since there are none where the work would take place.
- c. Cultural resources would not be affected.
- d. Endangered species would not be significantly affected.
- e. No significant land use changes would occur.
- f. Air and noise quality would not be significantly affected.
- g. Fish and wildlife would not be significantly affected.
- h. Aesthetics would not be significantly affected.
- i. Flood plain values would be improved.
- j. Benthic invertebrate communities would not be significantly affected.
- k. Construction activity would be short term and would not affect navigation or recreational boating.

Date _____

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Charleston