

**DRAFT
ENVIRONMENTAL ASSESSMENT
FOR
WALTON COUNTY, FLORIDA HURRICANE AND
STORM DAMAGE REDUCTION PROJECT
WALTON COUNTY, FLORIDA**



January 2010

DRAFT ENVIRONMENTAL ASSESSMENT

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DRAFT ENVIRONMENTAL ASSESSMENT

WALTON COUNTY HURRICANE AND STORM DAMAGE REDUCTION PROJECT WALTON COUNTY, FLORIDA

1.0 INTRODUCTION

Walton County's shoreline located in the Florida's panhandle is receding; the protective dunes and high bluffs are being destroyed by hurricane and storm forces that are occurring more frequently than before. The impacts of these storms to property and infrastructure are considerable and can possibly be reduced through a beach restoration and stabilization project which also includes environmental restoration opportunities associated with the beach and dune system. Behind the dune system, upland drainage feeds several freshwater lakes that intermittently breach the dune system and discharge directly into the Gulf. Primary dune elevations range from 11.5 to 44.5 feet NAVD88 and average 25.5 feet National Geodetic Vertical Datum (NGVD).

During the late 1990s, the area endured several strong hurricanes resulting in extensive shoreline erosion (Taylor Engineering, 2003). In 2004 the area was affected severely by Hurricane Ivan (Sep 04) and early into the 2005 hurricane season it was impacted by Hurricanes Arlene (June 05) and Dennis (July 05).

1.1 AUTHORITY

This study was authorized by a resolution of both the United States Senate and House of Representatives, which reads as follows:

Resolution Adopted July 15, 2002, by The United States Senate:

“Resolved by the Committee on Environment and Public Works of the United States Senate, That in accordance with Section 110 of the Rivers and Harbors Act of 1962, the Secretary of the Army is requested to review the feasibility of providing beach nourishment, shore protection and related improvements in Walton County, Florida, in the interest of protecting and restoring the environmental resources on and behind the beach, including the feasibility of providing shoreline and erosion protection and related improvements consistent with the unique characteristics of the existing beach sand, and with consideration of the need to develop a comprehensive body of knowledge, information, and data on coastal area changes and processes as well as impacts from federally constructed projects in the vicinity of Walton County, Florida.”

Resolution Adopted July 24, 2002, by The United States House of Representatives:

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That in accordance with Section 110 of the Rivers and Harbors Act of 1962, the Secretary of the Army is requested to review the feasibility of providing beach nourishment, shore protection and environmental restoration and protection in the vicinity of Walton County, Florida.

The non-Federal sponsor is the Walton County Board of Commissioners. Their central point of contact is the Director of Beach Management for the Walton County Tourist Development Council (TDC).

1.2 LOCATION OF STUDY AREA

Walton County is located approximately 103 miles east of Pensacola, Florida and 98 miles west of Tallahassee, Florida. The beaches of Walton County encompass approximately 26 miles of shoreline extending from the City of Destin in Okaloosa County, Florida (about six miles to the east of East Pass) to the Walton/Bay County line near Phillips Inlet (**Figure 1**). The western two-thirds of Walton County are comprised of a coastal peninsula extending from the mainland, and the eastern third is comprised of mainland beaches. Choctawhatchee Bay lies north of the peninsula. Walton County includes 11.9 miles of state-designated critically eroding areas and three State of Florida park areas that cover approximately six miles of the 26-mile shoreline.

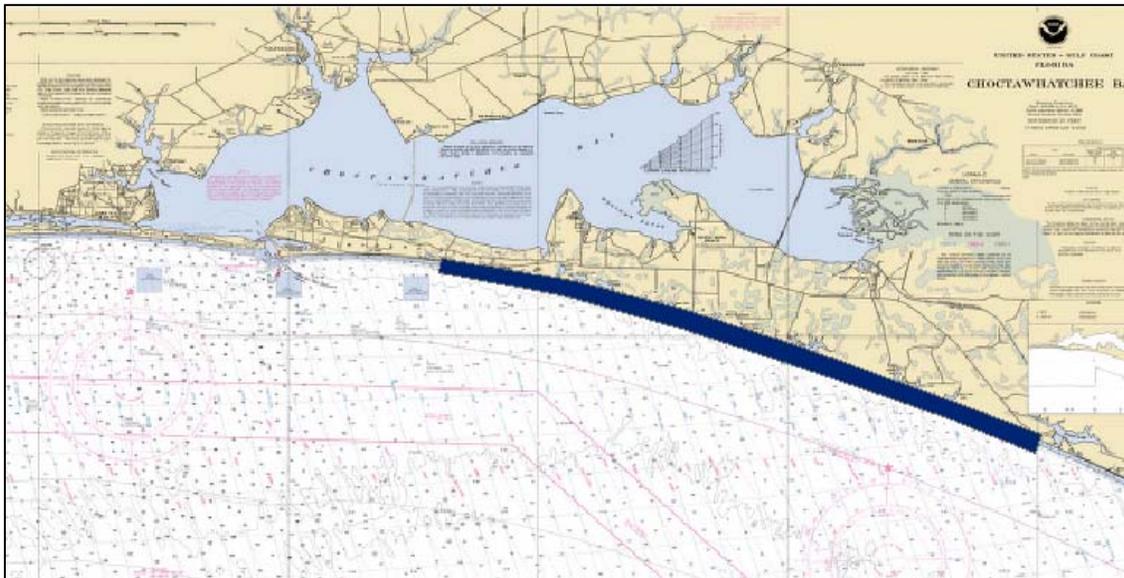


Figure 1. Location of Walton County project area

1.3 PURPOSE AND NEED

The purpose of this study is to assess the needs for hurricane and storm damage protection and opportunities for environmental restoration and protection along the Gulf Coast of Walton County, Florida. The purpose of this report is to document the environmental considerations completed to formulate a shore protection project for Walton County, Florida, which will reduce the damaging effects of hurricanes and severe storms to properties and environmental resources along the coast and stabilize or restore the shoreline by eliminating long-term erosion. The project is constructible, acceptable to the public, environmentally sustainable, and justified by an economic evaluation.

In addition to storm damage protection the proposed action provides environmental restoration opportunities. A report produced by the State of Florida following Hurricane Ivan (2004) to assess damages and recovery plan as a result of the storm, the state recommends an assisted recovery plan to implement beach and dune restoration and re-vegetation for the critical areas in Walton County. Such action would restore valuable dune and beach habitat including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat supporting various flora and fauna and general beach ecosystem functions. Restoring a beach-dune system allows greater stability and sustainability of the coastal environment once it has become established. Restoring the beach habitat that supports a variety of associated flora and fauna contribute to the success and continual survival of several threatened or endangered species. The restoration effort will also contribute to the well being of various other flora and fauna that naturally occur in the immediate vicinity as well as providing continued sustainability to the fragile ecosystems of the dune lakes that exists in the area. Future conditions associated with not restoring the beach and dune system would result in the continued absence of a valuable beach ecosystem and loss of these types of habitats and associated benefits. The already damaged habitats would remain particularly vulnerable to wave and storm activity that continually threaten and prevent the re-establishment of valuable natural resources.

1.4 SCOPE

This Environmental Assessment (EA) was prepared in accordance with Engineer Regulation (ER) 200-2-2, *Procedures for Implementing the National Environmental Policy Act (NEPA)* and the Council on Environmental Quality (CEQ) *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 Code of Federal Regulations (CFR) Pts. 1500-1508). The objective of the EA is to determine the magnitude of the environmental impacts of the proposed storm protection and restoration actions. If such impacts are relatively minor, a Finding of No Significant Impact (FONSI) would be issued and the Mobile District, U.S. Army Corps of Engineers will proceed with the Federal action. If the environmental impacts are significant

according to CEQ's criteria (40 CFR Pt. 1508.27), an Environmental Impact Statement (EIS) would be prepared before a decision is reached to implement the proposed action.

Applicable laws under which these impacts will be evaluated include the National Environmental Policy Act (NEPA), Endangered Species Act, the Clean Water Act, the Clean Air Act, the U.S. Fish and Wildlife Coordination Act, National Historic Preservation Act, Coastal Barrier Resources Act, Magnuson – Stevens Fishery Conservation and Management Act, and Coastal Zone Management Act.

1.5 ENVIRONMENTAL ASSUMPTIONS

The general environmental criteria for projects of this nature are identified in Federal environmental statutes, executive orders, planning guidelines, and the USACE Environmental Operating Principles (EOP). It is the national policy that ecosystem restoration, particularly that which results in conservation of fish and wildlife resources, be given equal consideration with other study purposes in the formulation and evaluation of alternative plans. The basic guidance during planning studies is to assure that care is taken to preserve and protect significant ecological and cultural resources, and to conserve natural resources. These efforts also should provide the means to maintain and restore, as applicable, the desirable qualities of the human and natural environment. Formulation of alternative plans should avoid damaging the environment to the extent practicable and contain measures to minimize or mitigate unavoidable environmental damages. Consistent with laws and policy, alternative plans formulated should avoid damaging the environment to the extent practicable and contain measures to minimize or mitigate unavoidable environmental impacts.

EOPs have been established for evaluation of water resource projects. Throughout the study process to ensure conservation, environmental preservation, and restoration is considered at the same level as economic issues. These principles are: 1) Strive to achieve environmental sustainability, 2) Consider environmental consequences, 3) Seek balance and synergy, 4) Accept responsibility, 5) Mitigate impacts, 6) Understand the environment, and 7) Respect other views. The following criteria were used to address environmental impacts during the evaluation of alternatives:

- Protection, preservation, and improvement of the existing fish and wildlife resources along with the protection and preservation of coastal and offshore habitat and water quality;
- Consideration in the project design of the least disruptive construction techniques and methods;

- Protection and preservation of endangered and/or threatened species, critical habitat, and EFH; and
- Preservation of significant historical and archeological resources through avoidance, if possible, or data recordation if destruction of the resources is necessary.

1.6 APPLICABLE ENVIRONMENTAL LAWS AND REGULATIONS

Of primary concern is compliance with the Clean Water Act. Potential water quality impacts associated with the borrowing and placement of fill material associated with beach nourishment operations must be considered. Such activities include evaluation of sediment from identified borrow sources for placement within the littoral zone throughout the study area. Sediment characteristics of concern are sediment grain size and color. Borrow sediments identified as suitable must match, as closely as possible, the sediment characteristics at the nourishment site. This information will be utilized in the preparation of the Section 404(b)(1) evaluation report and also in developing the management requirements to minimize impacts to threatened and/or endangered species under Section 7 of the Endangered Species Act.

Additional issues to be addressed include coordination with the U.S. Fish and Wildlife Service (FWS) on six Coastal Barrier Resource System Units. The Coastal Barrier Resources Act (CBRA) limits the expenditure of Federal funds in designated system units so that expenditure would not enhance future/further development of the area. The activities proposed within these units will provide enhancement of fish and wildlife resources and habitats which may be allowable under CBRA. The Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) identified habitats within the marine and estuarine areas of the U.S. that were essential to the management of certain specific fin and shellfish. Areas identified by the Gulf of Mexico Fishery Management Council as essential fish habitat (EFH) include all the marine and estuarine areas of Walton County. Consultation with the National Marine Fisheries Service (NMFS) focused on activities to minimize impacts to EFH. Of particular concern has been avoidance or minimization of impacts or the enhancement of EFH. Coordination with the FWS and NMFS concerning potential impacts to listed species is required and has been initiated for the selected Federal plan. Efforts have been made to include actions that would benefit the recovery of listed species.

All Federal activities affecting any land, water use, or natural resources of the coastal zone shall be carried out in a manner which is consistent, to the maximum extent practicable, with the enforceable policies of the Florida coastal management program. These activities have been evaluated to assess coastal zone management compliance. In addition, water quality certification (WQC) from the State of Florida is required for all actions to be implemented. A WQC/CZC application has been submitted to the state to obtain the necessary

certifications. The feasibility study of the critically eroded shoreline been conducted and found consistent with State of Florida’s beach management plan.

2.0 PROPOSED PROJECT DESCRIPTION

The Walton County upland cross section is defined by dune elevations ranging from +9.5 to + 33 feet NAVD88 and a natural berm elevation of +5.5 feet NAVD88. The study region was divided into five study reaches based on structural development and state park areas as illustrated in **Figure 2**. The historical and 2004 beach surveys were used to develop 11 representative profiles which characterize the existing condition for the five study reaches. The representative profiles were identified based on similarity in shape of the upper beach profile (dune height and width, berm width, foreshore beach slope, and profile volume) and shape of the offshore profile. Because significant erosion occurred due to Hurricane Ivan in September 2004, the representative profiles were revised using the post-Ivan data to characterize the upper portion of the beach and to include the post-Ivan data in the submerged portion of the beach.

Modeling using a model called Beach-*fx* was used to simplify beach profiles representing a single trapezoidal dune, with a horizontal berm as shown in **Figure 3**. The submerged profile is represented by a series of points or an approximate functional representation. The beach variables which change with storms are dune width, dune height, berm width, and upland elevation. Constant values are upland elevation, dune slope, berm height, foreslope, and shape of the submerged profile. Thus, in response to a given storm, the berm can be eroded or accreted; the dune height and/or width can change and translate landward or seaward.

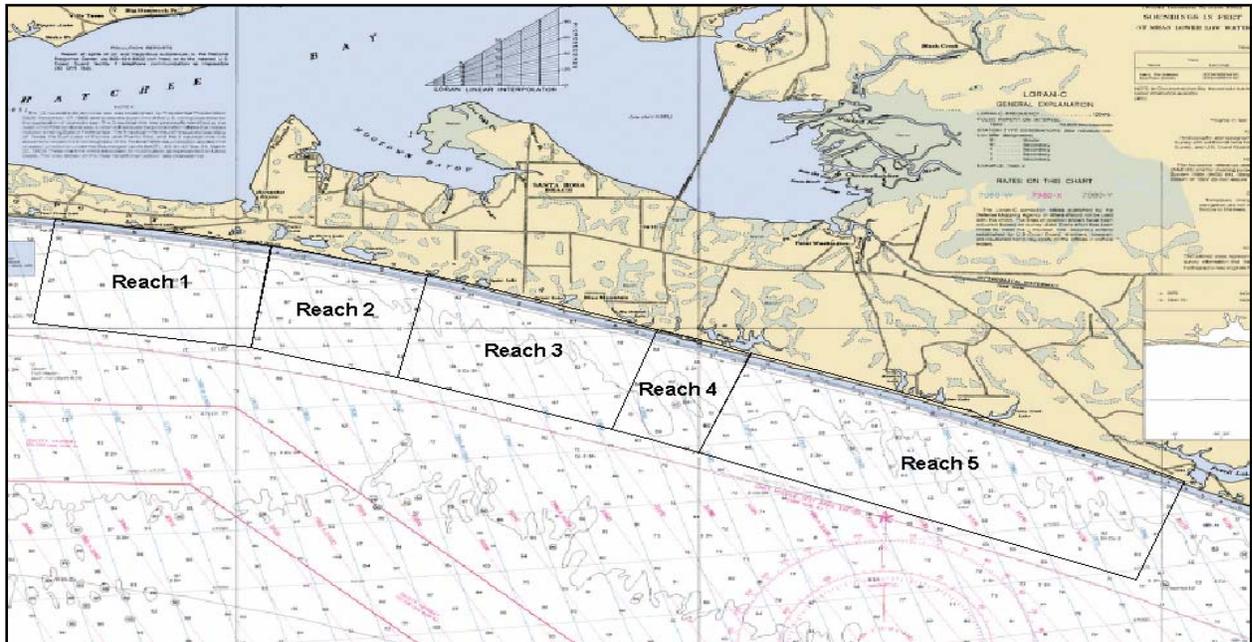


Figure 2. Location of the 5 construction reaches within the project area.

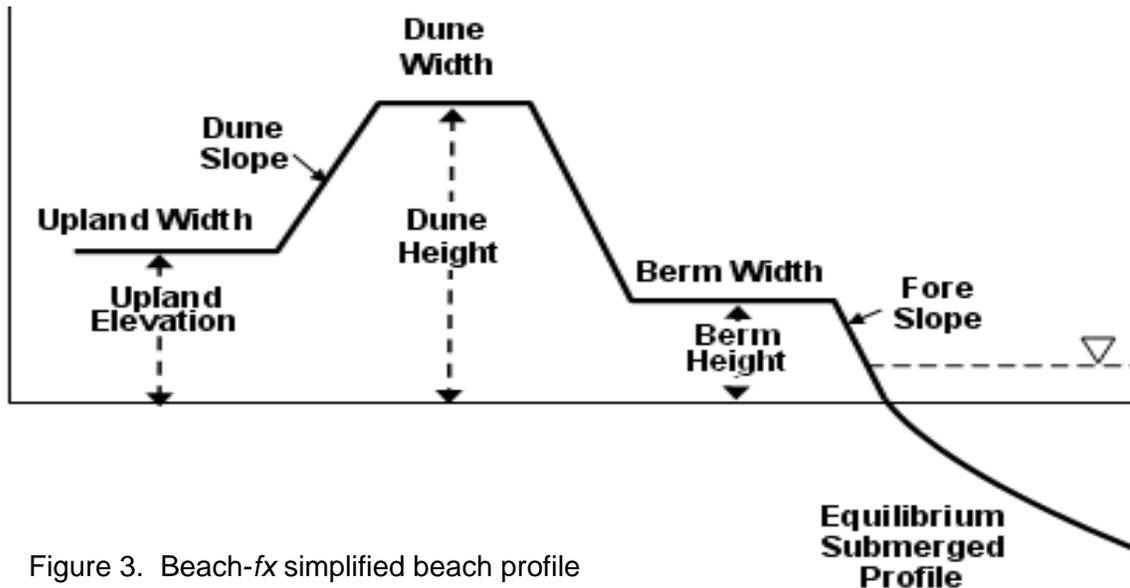


Figure 3. Beach-fx simplified beach profile

Eleven simplified beach profiles were modified for various berm and dune configurations. Maximum dune and berm widths were determined based on volumes provided by the Federal Emergency Management Agency (FEMA) post-Hurricane Ivan emergency beach nourishment. Other modeling was conducted using SBEACH to predict the response of each dune and berm configuration to the 552 storms developed for this study. Approximately 240,000 SBEACH simulations were conducted to develop the shoreline responses for the Beach-fx storm response database.

2.1 ALTERNATIVES

2.1.1 No Action. This alternative involves no restoration activity.

2.1.2 Structural Measures. In addition to the fact that the use of coastal structures in this case would not be consistent with state policy for a shore-wide solution for Walton County and not considered as a permissible alternative by the state, it is believed that the use of hard structures would have a negative impact on listed species inhabiting the area.

It has been demonstrated that a loss of nesting habitat related to placement of coastal structures has had an impact on nesting sea turtles in Florida. Structures not only cause the loss of suitable nesting habitat, but can result in the disruption of coastal processes accelerating erosion and interrupting the natural shoreline migration. Because of the effects on sea turtle nesting habitat believed to be caused by coastal structures, the continued vulnerability of remaining nesting habitat to frequent or successive severe weather events, may impact ability of sea turtle populations to survive and recover. In response to periodic storms, the beach itself moves landward,

construction or persistence of structures at their pre-storm locations can result in a major loss of nesting habitat. In addition, the presence of hard coastal structures may interfere with nesting turtle access to the beach, result in a change in beach profile and width (downdrift erosion, loss of sandy berms, and escarpment formation), trap hatchlings, and concentrate predatory fishes, resulting in higher probabilities of hatchling predation. The combination of habitat loss and nesting opportunities resulting from beachfront development and subsequent use of coastal structures such as seawalls, bulkheads, and groins is believed to be a threat to sea turtle survival and recovery and should be avoided where possible.

Coastal structures are known to have a similar affect on beach mouse habitat and various shorebirds known to exist along the project area. The use of seawalls, bulkheads, and groins disrupt the natural dune and beach building processes that are critical to the survival of endangered beach mouse populations and shorebirds. Because of the limited remaining habitat such structures could compromise the ability of certain populations to survive and recover. As with sea turtles, the combination of habitat loss to beachfront development and subsequent use of persistent coastal structures to stabilize the shorelines at their pre-storm locations has resulted in an increased threat to species survival and recovery. In order to preserve the survival and recovery of these species, it is recommended that the use of such coastal structures be avoided.

2.1.3 Beach Restoration Alternatives

A process was followed for initial screening of alternatives and resulted in the recommendation of a set of preliminary alternatives to further evaluate in feasibility. The design looked at both historical and current dune heights and dune widths and berm heights and berm widths over the study area as defined in each representative profile. In Reaches 1, 3, and 5 the dune height is preserved as a result of the emergency nourishment action. Because emergency nourishment is only applied to the dune, the erosion is most significant to the berm. It was then determined that the project alternatives for evaluation generally would vary the berm width in 50-, 75-, 100-, and 125-foot increments. The optimized section was found to be a 50 foot berm with a set dune height and width against the existing dune. Added dune width alternatives of 0, 10, 20 and 30 feet were run with the optimized berm width alternative of 25 feet (Optimized berm template of 50 feet, 25 berm width plus 25 feet of advanced nourishment). **Table 1** above summarizes the optimum added dune width within the five construction reaches by representative profile. The necessary beach fill requirements have been shown to be 3,000,000 cubic yards (cy) and 3,350,000 cy. Re-nourishments will be on a 12 year cycle but the renourishment volumes will increase to approximately 2,000,000 cy.

**TABLE 1
OPTIMUM ADDED DUNE WIDTH – REPRESENTATIVE PROFILE**

Construction Reach	Representative Profile	Existing Dune Width	Optimum Added Dune Width
CR1	R1P1	55	+10
	R1P2	100	+30
CR2	R3P1	76	+10 & +30
	R3P2	45	+10
CR3	R4P1	50	+10
	R4P2	85	+10
CR4	R5P1	185	+10
	R5P2	65	+10
	R5P3	50	+10
CR5	R5P1	185	+10
	R5P2	65	+10
	R5P3	50	+10

2.1.4 Selected Federal Plan

The selected plan recommended for construction is the LPP identified in the feasibility report which consists of five the construction reaches. The project will be composed of a 50-foot berm width, a 25-foot berm and an additional 25 feet of advanced nourishment in all construction reaches. The project will also feature added dune width in all construction reaches of either 10 or 30 feet. The modeling efforts have predicted fill requirements of 2,400,000 cy. This plan extends the coverage area to the westernmost limits of the county where the NED Plan could not justify the coverage. The model assumes an annual erosion rate of 100,000 cy annually lost to the system, thereby creating a renourishment cycle every 12 years requiring 1,200,000 cy of placement. However, recent surveys have shown that the erosion during a period of non-storm event activity has produced an initial placement of 2,980,000 cy. If this condition can be extrapolated to the predicted construction timeframe of FY10 or FY11, then the necessary beach fill requirements will be 3,350,000 cy. Re-nourishments will still be on a 12-year cycle but the renourishment volumes will increase to approximately 2,000,000 cy. Approved borrow sources lie offshore within the State of Florida waters and are described below. The typical cross sections for the selected plan illustrated in **Figure 4**. When dune construction is complete, the dune will be planted with at least three species of dune vegetation as described under Section 2.3.

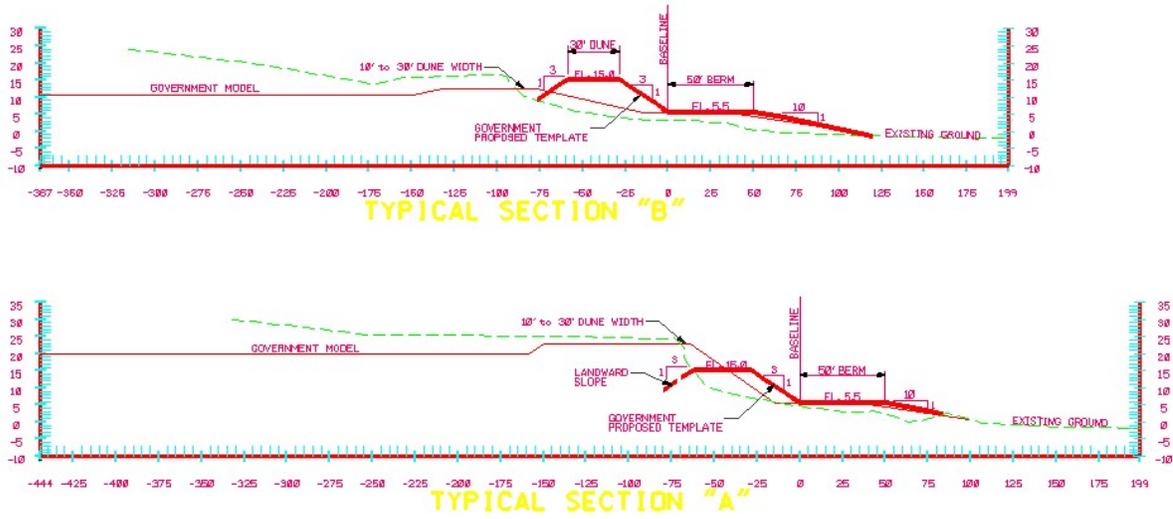


Figure 4. Selected plan typical cross sections to be constructed

2.1.5 Local Plan

It should be recognized that the local sponsor proceeded with pursuing a beach restoration plan of their own. Their local project area lays the length of Walton County. The proposed local plan includes a berm design that on average exhibits a construction profile that has a 207-ft wide berm measured from the existing 9.5 ft NAVD contour with a 10-ft wide dune crest. The proposed plan view and profiles totally encompasses the selected Federal plan and uses the same borrow site. Subsequently, the County has already completed the process of applying for the state WQC/CZC. They have also completed coordination for threatened and endangered species as required by the ESA, initiated coordination on essential fish habitat (EFH), completed cultural resources coordination, and prepared a draft EA. The local sponsor has requested that their efforts be considered as in-kind services toward their cost share requirement. Although their efforts are for a larger area, the same coordinations will be required for the selected Federal plan but has provided a level confidence that the same outcome will be achieved for the selected Federal plan. Much of the information already generated from the local plan is being used for the selected Federal plan.

2.2 BORROW AREAS

Recent offshore studies to include geological and geophysical interpretation to identify a suitable offshore borrow area has been performed by Taylor Engineering, Inc. (2003) in the Walton County Destin Beach Management Feasibility Study Final Report under contract to the local sponsor, which initially concentrated on the East Pass area southwest of Destin and the eastern most

end of Okaloosa County and the westernmost end of Walton County. Subsequent investigations looked at the entire coastline to assess locations with sufficient quantities for borrow development for the initial beach placement and future re-nourishments.

While initial prospective borrow sites appeared promising, additional geotechnical and geophysical work was conducted in these areas and further offshore and within the eastern end of Walton County to assess sources for the entire beach nourishment project. The initial data indicated pockets of viable sand bodies along the study site. The west flank of the study area in Okaloosa County has high quality sand associated with the eastern part of the Destin East Pass ebb-tide delta. Alternate sites that deserved additional reconnaissance were located offshore in approximately 65 to 70 feet of water.

A large scale reconnaissance level geophysical, lithological, and granulometric (grain size) investigation was undertaken off Walton County, Florida. Sub-bottom profiles were used initially to locate prospective core locations to identify high quality sand sources for beach nourishment. Vibracores and selected seismic records were interpreted in an attempt to confirm the presence and quality of sand off Walton County. The borrow area investigation locations are shown in **Figure 5**.

The proposed borrow area sediments are typically well sorted medium sand (1-2 phi). Monitoring of the borrow discharges will be a constant requirement for compliance with color and grain size criteria. Borrow area B-4 shown on **Figure 5** is the most promising site with some 10,000,000 cubic yards proven by these initial investigations. This volume covers the recommended locally preferred plan placement and the four planned subsequent re-nourishments for the next 50 years. The B-4 borrow area is centrally located and offers the best source for now and in the future. Based on the extensive geotechnical investigations, this borrow site has been demonstrated to be the most suitable source, has sand of color, size, and composition generally similar to that of the native beach. All materials used for beach nourishment will be excavated by hopper dredge, transported to the placement area offshore and pumped into the beach template. Small bulldozers will be used on land to shape the material to the prescribed template.

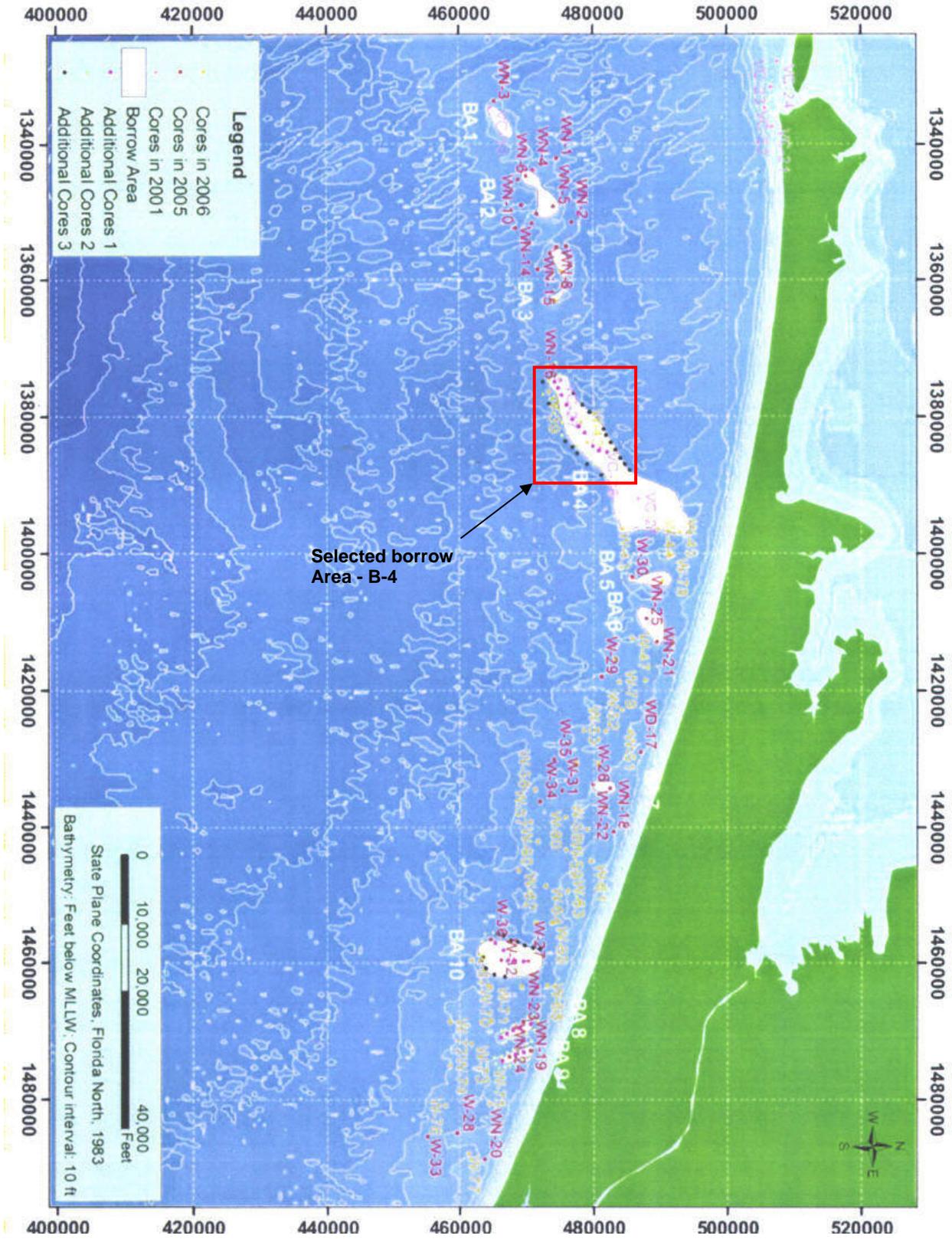


Figure 5. Borrow area investigation locations and selected borrow site

2.3 ENVIRONMENTAL RESTORATION OPPORTUNITIES

Coastal ecological resources throughout Walton County have consistently been diminished due to the high shoreline recession rates exhibited in this region. The result has been the loss of valuable habitat including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat supporting various flora and fauna, and general beach ecosystem functions. Restoring a beach-dune system allows greater stability and sustainability of the coastal environment once it has become established. Restoring the beach habitat that supports a variety of associated flora and fauna contribute to the success and continual survival of several threatened or endangered species. The restoration effort will also contribute to the well being of various other flora and fauna that naturally occur along the northern Gulf beaches.

There is currently little beach within the project area which reduces the capabilities of this area of supporting sea turtle nesting activities. By restoring berm width there will be increased opportunities towards protecting and enhancing sea turtle nesting opportunities. The enhanced berm creates additional habitat beneficial to a variety of shore birds as well as other inhabitants of the coastal environment. Wider beaches augment natural dune creation and maintenance, which will be beneficial for dune dwelling organisms and threatened and endangered species such as the Choctawatchee beach mouse and the Gulf coast lupine.

The storm activities of recent years have left the fragile coastal dune lakes found throughout Walton County vulnerable to future damages and catastrophic breaching. The lakes support a variety of coastal wildlife with natural communities unique to this region. Coastal dune lakes are important breeding areas for insects and crustaceans. Many birds and mammals also utilize coastal dune lakes for food and habitat. Restoring a beach-dune system in the areas adjacent to the dune lake resources will provide for continued sustainability to the fragile ecosystems of the lakes.

When dune construction is complete, the dune will be planted with at least three species of dune vegetation. Sand dunes are dynamic coastal features, which are formed and maintained by the accumulation of wind blown sand. The dune restoration activities will be designed to create a dune that matches the surrounding natural dune patterns in the area. Upon reconstruction immediate steps will be taken to plant and stabilize the dune for rapid stabilization. This will be accomplished through the use of sand fences and dune plants. The dune plants will be planted to cover 60-80% of the total area. Plantings will occur across the entire dune on approximate two-foot spacing. The vegetation will consist of local dominant species that populate nearby natural dune systems. The selection of the dune vegetation will consist of species that are most widely used for dune restoration and are readily available from local nurseries and suppliers. The selection will be coordinated with local environmental experts

familiar with dune ecosystems in the immediate area. Dune plant species being considered are:

- sea oats (*Uniola paniculata*)
- bitter panic grass (*Panicum ararum*)
- sea rocket (*Cakile constricta*)
- beach morning glory (*Ipomoea imperati*)
- railroad vine (*Ipomea pes-caprae*)
- blue stem (*Schizachyrium scoparium*)
- blanket flower (*Gaillardia pulchella*)

3.0 AFFECTED ENVIRONMENT

3.1 GENERAL ENVIRONMENTAL SETTING

Coastal Walton County consists of approximately 26 miles of both developed and undeveloped beach and dune systems including six miles of state parks and nine miles of state-designated critical eroding areas. The county's coastline also supports a number of coastal dune lakes considered rare worldwide and unique to the northern Gulf of Mexico the United States. The existing coastal resources within the study area range from natural pristine systems found within state park recreational areas to severely disturbed systems found within the more developed areas. The dune systems fronting developed areas range from little or no dune to larger relatively healthy dune systems. North of the county's coastal areas lies Choctawhatchee Bay. The ecosystem associated with Choctawhatchee Bay is typical of northern gulf coast estuaries including wetlands consistent with adjacent estuaries and submerged aquatic vegetation. It is not expected that the Bay will be affected by the proposed beach restoration and will not be considered further in this evaluation.

The area has been further characterized by a previous study conducted by Taylor Engineering, Inc. (2003), under contract to the local sponsor, as a coastal peninsula extending west from the mainland defining the western two-thirds of the coastline and mainland beaches characterizing the eastern third. Behind the county dune system, upland drainage feeds the coastal dune lakes that intermittently breach the dune system and discharge directly into the Gulf of Mexico. The area supports a variety of coastal wildlife with natural communities consistent with that of the northern Gulf of Mexico. The proposed beach restoration effort may potentially affect three beach zones which define the natural communities within the placement and borrow areas. These zones, addressed in this evaluation, are classified as coastal beach and dune, intertidal swash, and nearshore.

The study conducted by Taylor Engineering (2003) evaluated the native beach characteristics of Walton County and found that the sand in the beach system was fairly uniform throughout the study area. The beach system

sediments consist of medium-grained sand with minor amounts of carbonate material. A color analysis determined the Munsell color classification of the native beach sand. Generally, the native sand is described as white with slight variations in localized areas.

3.2 PHYSICAL CHARACTERISTICS

3.2.1 Tides. Taylor Engineering, Inc. (2003) determined single values for MHW and MLW representative of the entire project area by averaging the tidal datum elevations at several representative locations. The studies have determined that MHW lies at +0.65 ft NAVD and MLW lies at -0.62 ft NAVD in Walton County.

3.2.2 Waves. Waves provide important sediment transport mechanisms along the open coast of Walton County. Waves are primarily driven by local wind patterns, transport sand cross-shore (approximately north-south) and longshore (approximately east-west) within the subaqueous regions. Independent of wave direction, wave heights and periods of one foot and three seconds characterize the predominant waves, occurring nearly 30% of the time. Locally generated waves or sea conditions characterize these waves. Swell waves of higher wave height and wave period occur less frequently. On average, higher wave heights occur during the winter months and smaller wave heights occur during the summer months. However, absolute maximum wave heights indicate that extreme wave heights, associated with hurricanes and tropical storms, can occur during the summer months.

3.2.3 Littoral Transport. Littoral transport analyses indicate primarily westerly net longshore transport along the project area. Net longshore transport rates, reaching 63,000 cy/yr and 58,000 cy/yr reveal an accretive trend. However, Taylor Engineering, Inc. (2003) has shown that the Walton County beaches have had insufficient recovery times between storms resulting in the present unhealthy beach conditions.

3.2.4 Winds. Winds provide the primary wave-generating mechanism and directly transport sand on and off the dry beach. Winds blow from a wide variety of directions with the highest percentage of time (10.4%) from the east. Overall, winds blow less than 25 mph 90 – 95% of the time (Taylor Engineering, Inc., 2003).

3.2.5 Aeolian (wind) Sand Transport. Aeolian transport can remove and redistribute sand within the littoral zone. Onshore winds can carry sand from the beach and deposit it behind dunes (essentially removing it from the littoral system) and offshore winds can carry sand into the ocean (redistributing it within the littoral system). Taylor Engineering, Inc. (2003) reports that onshore aeolian transport rates range from 0.1 – 2.2 cubic yards per year

per linear foot of beach. These rates translate into approximately 6,300 cy/yr of sand lost from the littoral sediment via aeolian transport over the project area.

3.2.6 Native Beach Sediment. An average grain size, derived from 34 samples in the project area, of 0.26 millimeters (mm) characterizes the native beach sediments. The Unified Soils and Wentworth Classifications classify the Walton County beach sand as fine and medium-to-fine sand with less than one percent shell content.

3.2.7 Offshore Borrow Area Sediment. The proposed 1,558-acre borrow area consists of several cells with different excavation depths. Analysis of sediment data obtained from 51, 20-ft vibracores defined the horizontal and vertical boundaries which determined the limits of beach compatible sand according to color, composition, and grain size compared to the native beach sand. The average grain size and composition of the borrow area consists of sand 0.30 (mm) and classified as fine to medium-to-fine sand that contains less than one percent shell content.

3.3 ENVIRONMENTAL CHARACTERISTICS

3.3.1 Beach and Dune Areas. A prominent feature characterizing portions of the Walton County shoreline is the high dune elevations. This is partly attributed to the presence of Pleistocene bluffs formed as a result of an exposed submarine berm formed during inundation of the Florida panhandle during that period. However, natural dunes occur in isolated pockets with some of the dunes occurring at beachfront development. In some developed areas the dunes exhibit little relief and limited habitat value. In these areas, dune enhancements are common and typically contain planted vegetation such as sea oats (*Uniola paniculata*) to promote stabilization and growth. Some pioneer vegetation such as beach morning glory (*Ipomoea imperati*), railroad vine (*Ipomoea pes-caprae*), beach grass (*Ammophila breviligulata*) and sea rocket (*Cakile edentula*) have become established within the enhanced dune areas.

Topsail Hill State Preserve, Grayton Beach State Recreation Area, and Deer Lake State Recreation Area all feature relatively unaltered beach and dune ecosystems. In some instances the primary dune crests reach over 30 ft in height. Pioneer species including sea oats, beach morning glory, railroad vine, sea rocket, beach elder (*Iva imbricata*), camphor weed (*Heterotheca subaxillaris*), and bitter panicum (*Panicum amarum*) grow on the low primary dunes facing the ocean while Gulf bluestem (*Schizachyrium maritimum*), Cruise's golden aster (*Chrysopsis gossypina*), annual jointweed (*Polygonella articulata*), and the endangered Gulf coast lupine (*Lupinus westianus*) are found on the more stabilized dunes.

The natural dunes described above provide optimal habitat for the Choctawhatchee beach mouse (CBM) throughout the primary and secondary

dunes and occasionally scrub and interdunal areas. This nocturnal species feeds primarily on the seeds and fruits of dune vegetation such as bluestem, sea oats, and evening primrose (*Oenothera humifusa*). The decline of the populations results from five key factors: habitat loss and fragmentation primarily due to beachfront development, disease, predation, competition from exotic species, and loss of genetic diversity (USFWS, 1987).

The beaches (sub-aerial portions of the beaches above the water) are typical of beaches throughout the northern Gulf of Mexico. Beaches are a dynamic environment that changes drastically as a function of weather and wave conditions. The direction of the longshore transport along this region is from east to west. The constantly shifting sand does not allow vegetation to become established in the unconsolidated sandy substrate. The dynamic nature of the beach is generally a harsh unstable environment providing low animal and plant densities. The wildlife that does inhabit the beaches and dunes include sea turtles (for nesting), shorebirds (for foraging and resting), crustaceans such as ghost crabs (*Ocypode quadrata*), reptiles such as six-lined racerunners (*Cnemidophorus sexlineatus*), and various predators such as raccoons (*Procyon lotor*) and snakes. Beaches are important wintering areas for shorebirds such as sanderling (*Calidria alba*), dunlin (*Calidris alpina*), short and long-billed dowitchers (*Limnodromus griseus* and *Limnodromus scolopaceus*), plovers (*Charadrius spp.* and *Pluvialis spp.*), and willet (*Catoptrophorus semipalmatus*). Beaches and dunes are also important nesting sites for birds including terns (*Sterna spp.*), black skimmer (*Rhynchops niger*), and plovers.

3.3.2 Intertidal/Swash Zone. The sandy substrate of the intertidal swash zone provides habitat for benthic and infaunal communities characterized by low species diversity. Saloman and Naughton (1978) investigated benthic macroinvertebrate assemblages inhabiting the swash zone at Panama City Beach, Florida. Sampling data showed four dominant species representing four families: *Donax texasianus*, a burrowing bivalve; *Scolecopsis squamata*, a polychaete worm; *Haustorius sp.*, an amphipod; and *Emerita talpoida*, an anomuran crab. Saloman and Naughton concluded that benthic communities inhabiting the swash zone of Panama City Beach were typical of other sandy Gulf of Mexico beaches. Similar benthic communities in this zone should exist along the beaches of Walton County. This portion of the beach also provides foraging and resting habitat for numerous seabirds and shorebirds such as terns, gulls (*Larus spp.*), sandpipers (*Tringa*, *Calidris*, and *Actitis spp.*), plovers, skimmers, and oystercatchers (*Haematopus spp.*). Fish and invertebrates within the intertidal zone are the staple diet for these avian species.

3.3.3 Nearshore. As typical of the sandy panhandle beaches, the nearshore zone along Walton County consists of two distinct longshore sandbars. For Florida panhandle beaches, the first and second sandbars are typically located approximately 50 to 80 feet and 425 to 460 feet offshore (Wolfe et al., 1988). These sandbars and associated troughs provide habitat for a

diverse benthic community. Saloman (1976) investigated benthic faunal populations inhabiting the nearshore zone off Panama City Beach, Florida. A variety of crabs, marine worms, clams, cumaceas, and sand hoppers dominate the nearshore zone. *Donax texasianus*, a burrowing bivalve, commonly occurred on both sandbars and troughs in between. Other dominant species found on the first offshore bar include *Haustorius sp.* (an amphipod), *Mancocuma sp.* (a cumacea), and *Scolelepis squamata* (a polychaete worm). Additional dominant species found on the second sandbar and adjacent landward trough includes the haustoriid amphipods *Acanthohaustorius n. sp.*, *Protohaustorius n. sp.*, and *Pseudohaustorius n. sp.* The assumption that similar benthic communities exist in the nearshore marine zone off Walton County is reasonable. Many commercially, recreationally, and ecologically important fish species are known to inhabit the nearshore area of Florida’s northern gulf coast. **Table 2** lists abundant fish species likely to occur in the nearshore marine waters of Walton County

3.3.4 Dune Lakes. An unusual attribute of the Walton County’s coastal beach and dune community is the presence of coastal dune lakes. There are a number of dune lakes throughout the Walton County coast as shown in **Figure 6**. Coastal dune lakes are relatively small bodies of water that occur in coastal communities along the northern Gulf of Mexico. The lakes are typically

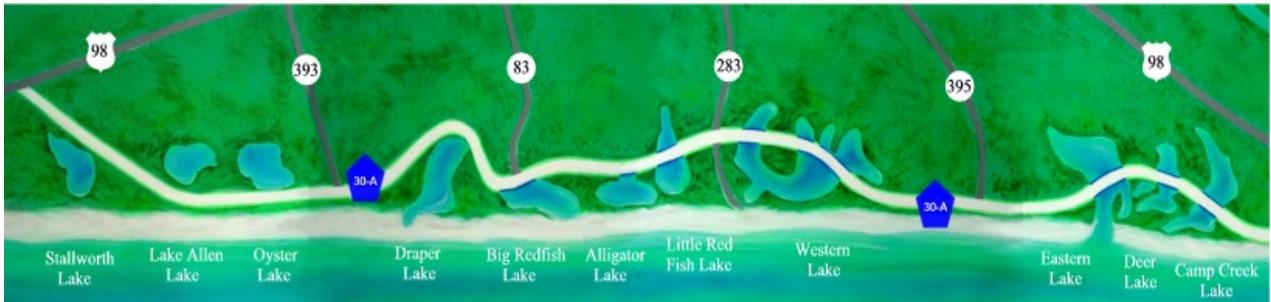


Figure 6. Approximate locations of coastal dune lakes throughout Walton County

separated from the Gulf by a barrier beach and dune system which may be intermittent with or without a meandering tidal outlet and example of which is shown in **Figure 7**. Some of the coastal dune lakes have dune systems 500 feet wide and ridges extending 10-30 feet high. The intermittent connection to the Gulf is what distinguishes these lakes as rare. The Florida Natural Areas Inventory designates the coastal dune lakes as “critically



Figure 7. Example of the coastal dune lakes in Walton County.

impaired in Florida because of extreme rarity.”

Coastal dune lakes are important breeding areas for insects and crustaceans. Many birds and mammals also utilize coastal dune lakes for food and habitat. The rapid rise of development in the South Walton area, including around the coastal dune lakes, raises the concern that nutrient runoff and sedimentation may impact the fragile ecosystems of the lakes. The lakes generally

TABLE 2. COMMON NEARSHORE FISH SPECIES FOUND IN WALTON COUNTY

Common Name	Scientific Name
Sheepshead <i>Archosargus probatocephalus</i>	Pinfish <i>Lagodon rhomboides</i>
Silver perch <i>Bairdiella chrysura</i>	Spotted seatrout <i>Cynoscion nebulosus</i>
Bull shark <i>Carcharhinus leucas</i>	Bonnethead <i>Sphyrna tiburo</i>
Sand seatrout <i>Cynoscion arenarius</i>	Silver seatrout <i>Cynoscion nothus</i>
Bluntnose stingray <i>Dasyatis sayi</i>	Ladyfish <i>Elops saurus</i>
Speckled worm eel <i>Myrophis punctatus</i>	Atlantic croaker <i>Micropogon undulates</i>
Southern kingfish <i>Menticirrhus americanus</i>	Scaled sardine <i>Harengula pensacolae</i>
Striped anchovy <i>Anchoa hepsetus</i>	Gulf kingfish <i>Menticirrhus littoralis</i>
Minkfish <i>Menticirrhus focaliger</i>	Bay anchovy <i>Anchoa mitchilli</i>
Dusky anchovy <i>Anchoa lyolepis</i>	Silver anchovy <i>Engraulis eurystole</i>
Scaled sardine <i>Harengula jaguana</i>	Sea catfish <i>Arius felis</i>
Gulf toadfish <i>Opsanus beta</i>	Halfbeak <i>Hyporhamphus unifasciatus</i>
Atlantic needlefish <i>Strongylura marina</i>	Redfin needlefish <i>Strongylura notata</i>
Sheepshead minnow <i>Cyprinodon variegates</i>	Longnose killifish <i>Fundulus grandis</i>
Rough silverside <i>Membras martinica</i>	Tidewater silverside <i>Menidia beryllina</i>
Gulf pipefish <i>Syngnathus scovelli</i>	Bluefish <i>Pomatomus saltatrix</i>
Cobia <i>Rachycentron canadum</i>	Northern sennet <i>Sphyrna borealis</i>
Crevalle jack <i>Caranx hippos</i>	Yellow jack <i>Caranx bartholomaei</i>
Atlantic bumper <i>Chloroscombrus chrysurus</i>	Leatherjacket <i>Oligoplites saurus</i>
Florida pompano <i>Trachinotus carolinus</i>	Spotfin mojarra <i>Eucinostomus argenteus</i>
Silver jenny <i>Eucinostomus gula</i>	Pigfish <i>Orthopristis chrysoptera</i>
Sheepshead <i>Archosargus probatocephalus</i>	Pinfish <i>Lagodon rhomboides</i>
Silver perch <i>Bairdiella chrysura</i>	Spotted seatrout <i>Cynoscion nebulosus</i>
Sand seatrout <i>Cynoscion arenarius</i>	Silver seatrout <i>Cynoscion nothus</i>
Spot <i>Leiostomus xanthurus</i>	Atlantic croaker <i>Micropogon undulates</i>
Southern kingfish <i>Menticirrhus americanus</i>	Gulf kingfish <i>Menticirrhus littoralis</i>
Minkfish <i>Menticirrhus focaliger</i>	Black drum <i>Pogonius cromis</i>
Atlantic spadefish <i>Chaetodipterus faber</i>	Striped mullet <i>Mugil cephalus</i>
White mullet <i>Mugil curema</i>	Atlantic threadfin <i>Polydactylus octonemus</i>
Southern stargazer <i>Astroscopus y-graecum</i>	Leopard searobin <i>Prionotus scitulus</i>
Spotted whiff <i>Citharichthys macrops</i>	Gulf flounder <i>Paralichthys albigutta</i>
Planehead filefish <i>Monacanthus ciliatus</i>	Striped burrfish <i>Chilomycterus schoepfi</i>
Permit <i>Trachinotus falcatus</i>	Lizardfish <i>Synodus foetens</i>
Bull shark <i>Carcharhinus leucas</i>	Bonnethead <i>Sphyrna tiburo</i>
Bluntnose stingray <i>Dasyatis sayi</i>	Ladyfish <i>Elops saurus</i>
Speckled worm eel <i>Myrophis punctatus</i>	Scaled sardine <i>Harengula pensacolae</i>
Striped anchovy <i>Anchoa hepsetus</i>	Bay anchovy <i>Anchoa mitchilli</i>
Dusky anchovy <i>Anchoa lyolepis</i>	Silver anchovy <i>Engraulis eurystole</i>
Scaled sardine <i>Harengula jaguana</i>	Sea catfish <i>Arius felis</i>
Gulf toadfish <i>Opsanus beta</i>	Halfbeak <i>Hyporhamphus unifasciatus</i>
Atlantic needlefish <i>Strongylura marina</i>	Redfin needlefish <i>Strongylura notata</i>
Sheepshead minnow <i>Cyprinodon variegates</i>	Longnose killifish <i>Fundulus grandis</i>
Rough silverside <i>Membras martinica</i>	Tidewater silverside <i>Menidia beryllina</i>
Gulf pipefish <i>Syngnathus scovelli</i>	Bluefish <i>Pomatomus saltatrix</i>
Cobia <i>Rachycentron canadum</i>	Northern sennet <i>Sphyrna borealis</i>
Crevalle jack <i>Caranx hippos</i>	Yellow jack <i>Caranx bartholomaei</i>
Atlantic bumper <i>Chloroscombrus chrysurus</i>	Leatherjacket <i>Oligoplites saurus</i>
Florida pompano <i>Trachinotus carolinus</i>	Spotfin mojarra <i>Eucinostomus argenteus</i>
Silver jenny <i>Eucinostomus gula</i>	Pigfish <i>Orthopristis chrysoptera</i>

acquire water through lateral groundwater seepage and are shallow with depths typically around five feet. The most distinct characteristic of these lakes is their intermittent connection with the Gulf of Mexico. During periods of high water, caused by rainfall, runoff, groundwater seepage, or other inflow, water levels will sometimes reach a critical height causing a lake to “blow out” and connect with the gulf allowing for the exchange of fresh and salt water. The result is an unusual brackish environment that hosts a very diverse biological community.

Vegetation may be largely restricted to a narrow band along the shore, composed of various grasses and herbs or a dense shrub thicket, depending on fire frequency and/or water fluctuations. Shallow, gradually sloping shorelines may have much broader bands of emergent vegetation with submersed aquatic plants occasionally dominating much of the surface. Typical plants include rushes, sedges, marsh pennywort, cattail, sawgrass, water lilies, water shield, royal fern, marsh fleabane, marsh elder, salt myrtle, and black willow. Typical animals associated with this community include mosquitofish, sailfin molly, American alligator, mud turtle, saltmarsh snake, little blue heron, coot, and otter.

The substrate of the coastal dune lakes is primarily composed of sands with organic deposits increasing with water depth. Coastal dune Lakes characteristically have slightly acidic, hard water with high mineral content, predominately sodium and chloride. Salinity levels often vary greatly, depending on local rainfall and storms. Storms occasionally provide large inputs of salt water and salinities vary dramatically over the long term.

3.3.5 Protected and Endangered Species. This section addresses listed species known to exist in the specific project areas. The presence of these species necessitates coordination with the appropriate agencies as required by the Endangered Species Act. **Table 3** contains a more general list of State and Federal Protected Species in the Walton County area.

Florida’s panhandle beaches provide nesting grounds for federally listed (threatened and endangered) marine turtles. Marine turtle nesting season in this area spans from May 1 through October 31. The threatened Atlantic loggerhead turtle (*Caretta caretta*) and the endangered green turtle (*Chelonia mydas mydas*) frequently nest on the beaches of Walton County and Destin. The endangered leatherback (*Dermochelys coriacea*), Kemp’s ridley (*Lepidochelys kempi*), and hawksbill (*Eretmochelys imbricata*) sea turtles may also occasionally nest on northwest Florida’s beaches.

The swash and nearshore zone is host to the endangered Gulf sturgeon (*Acipenser oxyrinchus*) during certain times of the year and has been determined as sturgeon wintering feeding ground from the Yellow River, Choctawhatchee River, and Apalachicola River subpopulations. The project areas from the Mean High Water (MHW) line of the mainland shoreline extending seaward one nautical mile is designated as Gulf sturgeon critical habitat.

TABLE 3. LIST OF PROTECTED SPECIES IN THE WALTON COUNTY AREA

Common Name	Scientific Name	State	Federal
Fish			
Gulf Sturgeon	<i>Acipenser oxyrinchus desotoi</i>	SSC	T
Reptiles			
American alligator	<i>Alligator mississippiensis</i>	SSC	T (s/a)
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Atlantic loggerhead turtle	<i>Caretta caretta</i>	T	T
leatherback turtle	<i>Dermochelys coriacea</i>	E	E
Kemp's ridley	<i>Lepidochelys kempii</i>	E	E
Green sea turtle	<i>Chelonia mydas mydas</i>	E	E
Hawksbill turtle	<i>Eretmochelys imbricata imbricata</i>	E	E
Birds			
Arctic peregrine falcon	<i>Falco peregrinus tundrius</i>	CE	CE
Wakulla seaside sparrow	<i>Ammodramus maritimus junciculus</i>	SSC	n/a
bald eagle	<i>Haliaeetus leucocephalus</i>	**	**
brown pelican	<i>Pelecanus occidentalis</i>	SSC	n/a
least tern	<i>Sterna antillarum</i>	T	n/a
Southeastern American kestrel	<i>Falco sparverius paulus</i>	T	n/a
black skimmer	<i>Rynchops niger</i>	SSC	n/a
Southeastern snowy plover	<i>Charadrius alexandrinus tenuirostris</i>	T	n/a
snowy egret	<i>Egretta thula</i>	SSC	n/a
reddish egret	<i>Egretta rufescens</i>	SSC	SSC
tricolored heron	<i>Egretta tricolor</i>	SSC	n/a
little blue heron	<i>Egretta caerulea</i>	SSC	n/a
piping plover	<i>Charadrius melodus</i>	T	T
American oystercatcher	<i>Haematopus palliatus</i>	SSC	n/a
white ibis	<i>Eudocimus albus</i>	SSC	n/a
seaside sparrow	<i>Ammodramus maritimus</i>	SSC	n/a
grasshopper sparrow	<i>Ammodramous savannarum</i>	E	E
Florida sandhill crane	<i>Grus canadensis pratensis</i>	T	n/a
marsh wren	<i>Cistothorus palustris</i>	SSC	n/a
Mammals			
West Indian manatee	<i>Trichechus manatus floridanus</i>	E	E
Choctawhatchee beach mouse	<i>Peromyscus polionotus allophrys</i>	E	E
Plants			
Gulf coast lupine	<i>Lupinus westianus</i>	T	n/a

E= Endangered. T= Threatened. T (s/a)= Threatened due to similarity in appearance. SSC= Species of Special Concern. UR= Under review. CE= Consideration Encouraged, n/a= information not available or no designation listed. ** Protected under the Bald and Golden Eagle Protection Act.

The Choctawhatchee beach mouse (CMB), a federally listed endangered species, inhabits the coastal dune communities along portions of the northern gulf coast. This endemic subspecies once had a historic range from East Pass in Okaloosa County to Shell Island in Bay County. Today, only three main populations exist in Topsail Hill State Preserve and Grayton Beach State Recreation Area in Walton County, and Shell Island in Bay County. The U.S. Fish and Wildlife Service (FWS) designated all three areas as critical habitat for the CBM. In Walton County, Topsail Hill State Preserve comprises about 200 acres of critical habitat along 2.7 miles of coastline. Critical habitat within Grayton Beach State Recreation Area consists of 67 acres along 1.7 miles of coastline. The Florida Department of Environmental Protection manages these areas. The population at Grayton Beach State Recreation Area exists only as a result of a translocation program in cooperation with the Florida Fish and Wildlife Conservation Commission (FWCC) and the Florida Department of Environmental Protection.

Several protected bird species use beach habitat for foraging, resting, or nesting. The black skimmer, least tern (*Sterna antillarum*), and southeastern snowy plover (*Charadrius alexandrinustenuirostris*) have all used portions of the beach within Walton County. In Florida, migratory bird nesting season spans from April 1 through August 31.

The piping plover (*Charadrius melodus*) nests well to the north, but winters in different areas of Florida including the gulf coast. The State of Florida designates the black skimmer as a species of special concern, and the southeastern snowy plover and least tern as threatened species. Both Federal and state entities consider the piping plover a threatened species.

The endangered Gulf coast lupine (*Lupinus westianus*) is a plant that inhabits the coastal dunes of Walton County. This species is specific to the coastal areas of the eastern and northern Gulf of Mexico. Coastal development and storm induced dune erosion has a direct impact towards sustaining suitable habitat for this species.

3.3.6 Essential Fish Habitat (EFH). EFH is defined as those waters and substrates necessary to fish for spawning, breeding, feeding, or growth to maturity and include aquatic areas and their associated physical, chemical, and biological properties that are used by fish, and may include aquatic areas historically used by fish where appropriate. The near and offshore areas of the Walton County project reaches supports a variety of fish species, primarily small species and juveniles of larger fish species. EFH for many of these species occurs within the project area and include such species managed under the purview of the NMFS and identified in **Table 4**.

The Magnuson-Stevens Fishery Conservation and Management Act (MSFCA) require that federal agencies assess potential impacts to EFH for

NMFS managed commercial fisheries. In accordance with the MSFCA, any federal action that has the potential to adversely affect EFH requires consultation with the NMFS. As defined by the MSFCA, fish includes finfish, mollusks, crustaceans, and all other forms of marine animal and plant life. EFH communities range from naturally occurring hard-bottom areas and artificial reefs to floating mats of *Sargassum sp.* (brown- algae). Fish habitat utilized by a species can change with life history stage, abundance of the species and

Table 4. Essential Fish Habitat for Managed Species within the Project Area

Species	Life Stage	Habitat
Brown Shrimp	Adult	Soft bottom; estuarine dependent
Cobia	Adult, juveniles/subadults, larvae, eggs	Pelagic; drifting or stationary floating objects
Dolphin (Mahi)	Adult, juveniles/subadults, larvae, eggs	Pelagic; floating objects
Greater Amberjack	Adult, juveniles/subadults, larvae, eggs	Pelagic and epibenthic; reefs and wrecks; to 400m
Gray Snapper	Adult	All bottom types; 0 to 130m
King Mackerel	Adult	Pelagic
Lesser Amberjack	Adult, juveniles/subadults, larvae, eggs	Pelagic
Lane Snapper	Adult, juveniles/subadults, larvae, eggs	Soft and hard bottom; 0 to 130m
Little Tunny	Adult, juveniles/subadults, larvae, eggs	Pelagic
Pink Shrimp	Adult	Soft, hard bottom; inshore to 65m
Brown Shrimp	Adults (year-round)	Year-round in water depth >14 m; soft bottom
Red Drum	Adult	Soft bottom, oyster reefs, estuarine to 40 m
Stone Crab	Adult	Soft, hard, or vegetated bottom
Spanish Mackerel	Adult, juveniles/subadults, larvae, eggs	Pelagic; inshore to 200 m
Tilefish	Adult	Soft bottom, steep slopes; 80 to 540m
White Shrimp	Adult juveniles/subadults, larvae, eggs	Soft bottom; inshore to 40m

competition from other species, and environmental variability in time and space. The type of habitat available, its attributes, and its functions are important to species productivity and societal benefits. Some potential threats to habitat include certain fishing practices, marina construction, navigation projects, dredging, alteration of freshwater input into estuaries, and runoff. The Gulf of Mexico Fishery Management Council identified and described EFH for all life stages of 26 species within the northern Gulf of Mexico.

3.4 WATER QUALITY

The FDEP classifies the coastal water in the project area as Class III, defined as waters suitable for recreation and propagation of fish and wildlife. The

FDEP sets water quality standards and requires monitoring of water quality during sand excavation and beach placement operations. A water quality certification must be obtained for the activities with the borrow area and beach placement areas associated with this project.

3.5 SEDIMENT QUALITY

A compatibility analysis was conducted by Taylor Engineering (2003). Borrow area and beach samples were taken to compare provide a comparison between the beach and proposed borrow area. Walton County Beaches as well as in the submerged active profile. The sediment characteristics of both the beach and borrow area are presented in sections 3.2.6 and 3.2.7 respectively. The proposed borrow area contains sediments that have been approved by the State of Florida as being similar and compatible to the existing beach sands in both grain size and color characteristics.

3.6 HAZARDOUS, TOXIC, AND RADIO ACTIVE WASTE

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

3.7 AIR QUALITY

The FDEP operates air quality monitors in various counties throughout the state (FDEP, 2003). Although there are no ambient monitors in Okaloosa County, there are monitors in neighboring Santa Rosa and Bay Counties. USEPA has classified all counties within the state of Florida as “attainment” for criteria pollutants per FDEP. Non-point sources such as vehicular traffic exist within the area; however, air quality along the Walton County beaches is good due to the presence of either on or offshore breezes that readily disperse airborne pollutants. Walton County is classified as an attainment area for all Federal Air Quality Standards.

The Air Quality Index (AQI) is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country. AQI ratings for the areas throughout the Florida panhandle fall consistently within the highest quality rating of “good” for all the pollutants regulated by EPA.

3.8 NOISE

Noise is sound that interferes with normal activities or that otherwise diminishes the quality of the environment. It may be intermittent or continuous, steady or impulsive, stationary or transient. Stationary sources are normally related to specific land uses (for example, a factory). Transient noise sources move through the environment, either along relatively established paths (for example, highways and railroads), or randomly. There is wide diversity in responses to noise that not only vary according to the type of noise and the characteristics of the sound source, but also according to the sensitivity of the receptor (a person or animal), the time of day, and the distance between the noise source and the receptor.

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

3.9 AESTHETICS

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

3.10 RECREATION

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

3.11 HISTORIC AND CULTURAL RESOURCES

The Walton County shoreline has been the site of numerous cultural resources investigations since the 1940s. Over forty archaeological and historical sites are known to exist within one mile inland of the current beachfront with at least two of those sites considered potentially eligible or eligible for the National Register of Historic Places. Known archaeological sites suggest that humans have occupied the area as far back as 8500 BC, beginning with the Archaic period. The Walton County coast has been continually although sparsely inhabited up to the present.

In order to fully assess the study area for cultural resources that may be impacted by the proposed beach re-nourishment project, a more defined area of potential effect has to be established. The area of potential effect will primarily be defined by the property, both terrestrial and submerged, that is directly

impacted by project activities including access roads, staging areas, borrow areas, and temporary dikes that might be constructed to contain sand. Once clearly defined, the Florida State Site Files and other appropriate background records will be consulted regarding the locations of known archaeological sites within the impact area. Areas found to possess a medium or high potential for intact resources have been systematically investigated in a cultural resource survey. The locations of offshore impact areas have been investigated for the presence of submerged cultural resources through systematic remote sensing surveys.

In accordance with Section 106 of the National Historic Preservation Act and other relevant cultural resource laws, recommendations and actions have been coordinated with the Florida State Historic Preservation Officer (FLSHPO). Mobile District cultural resources staff has provided the appropriate narratives for the National Environmental Policy Act (NEPA) documentation summarizing the results of the cultural resources investigations and coordination. No significant cultural resources have been identified. More detailed information pertaining the cultural resources survey and Section 106 coordination is presented in Sections 4.17 and 5.6.

3.12 SOCIO-ECONOMIC CONSIDERATIONS

3.12.1 Demographics. Walton County is located in the State of Florida. Today the county incorporates 1,238 square miles and more than 40,000 people. Walton County is one of the fastest growing counties in Florida. According to the U.S. Census Bureau in 2000, there are 40,601 people and 16,548 households residing in the county. The population density is 38 persons per square mile. There are 29,083 housing units at an average density of 28 per square mile. The racial makeup of the county is 88.41 percent white, 6.98 percent African American, 1.28 percent Native American, 0.45 percent Asian, 0.04 percent Pacific Islander, 0.75 percent from other races, and 2.09 percent from two or more races. Slightly over two percent of the population is Hispanic or Latino of any race. Because the Gulf of Mexico borders Walton County to the south, the county along with neighboring counties share over 200 miles of quality beaches. The other counties included in the Florida panhandle include Escambia, Santa Rosa, Okaloosa, Bay, and Gulf Counties.

3.12.2 Population. The panhandle counties experienced population growth from 1980 to 2000. Combined the Florida panhandle grew by about 65.9 percent, surpassing the growth rate of Florida for that same time frame. Out of the five counties, Okaloosa County has the highest population and Gulf County the lowest. Most of the growth took place in Santa Rosa and Walton Counties. Santa Rosa County led in growth from 1980 to 1990 by increasing over 45 percent, but Walton County led in growth from 1990 to 2000 with over a 46 percent increase. Despite Walton County's tremendous population

growth, the county is second to last in persons per square mile when compared to the remaining five counties with Gulf County being the lowest.

3.12.3 Employment. The number of persons in the labor force increased for panhandle counties from 1990 to 2000. Total civilian labor force for the five counties out grew Florida civilian labor force in percentage terms. With an increase of over 42 percent, Santa Rosa County saw the biggest increase in the number of civil persons in the labor force. However, despite out growing Florida civilian labor force, in 2000, the counties had a higher unemployment rate than Florida. Gulf County had the highest rate of unemployment at 7.3 percent, while Walton County had the lowest at 3.2 percent.

3.12.4 Households. All five counties experienced a household increase from 1990 to 2000. With an increase of over 46 percent, Santa Rosa and Walton Counties had the highest percentage increase in the number of households. Out of the five counties, Okaloosa had the highest number of households with 66,269 households in 2000. The median household income also increased from 1989 to 1997 for the five counties. Of the five counties, Santa Rosa County had the highest median household income in 1997, and also the greatest percentage increase from 1989 to 1997. The median household income for Santa Rosa and Okaloosa Counties both were higher than that of the State of Florida in 1997.

4.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

4.1 NO ACTION

Future conditions associated with not restoring the beach and dune system would result in the continued absence of a valuable beach ecosystem and loss of these types of habitats and associated benefits. The already damaged habitats would remain particularly vulnerable to wave and storm activity that continually threaten and prevent the re-establishment of valuable natural resources. Opportunities would be lost to implement beach and dune restoration and re-vegetation for the critical areas in Walton County. Degradation of valuable dune and beach habitat including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat that supports various flora and fauna, and general beach ecosystem functions would persist as the area continues to be vulnerable to even minor storm activity. A no-action scenario would not provide the much needed stability and sustainability that a healthy coastal environment could offer to the area. The already damaged habitats would remain particularly vulnerable to wave and storm activity that continually threaten and prevent the re-establishment of valuable natural resources.

4.2 BEACH RESOURCES

The proposed work would create disturbance to fauna species; such as crabs and shorebirds utilizing the terrestrial habitats within the project limits. This

would mainly involve short-term disturbance from equipment, vehicles and personnel movements for the duration of work. However, these species are mobile and would generally avoid the site during construction. Some loss of beach flora may occur during nourishment; however this is expected to be minimal. Based on previous coordination with the State and USFWS, a number of conservation measures associated with the protection of shorebirds will be incorporated into the project. These include: shorebird and shorebird nesting surveys for construction work conducted between February and September and buffer zones around identified shorebird courtship or nesting behavior within the project area.

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

The material to be utilized during restoration of the beach meets the criteria set forth in 20 CFR 230.60(b). The material is characterized as clean sand which is sufficiently removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the placement areas would not be contaminated by such pollution. In addition, the material originates in the near vicinity of the placement activity and is similar to the substrate of the placement site, and receives the same overlying waters as the placement site.

4.3 OFFSHORE RESOURCES (Borrow Site)

Offshore equipment employed for borrow area excavation typically consists of a hopper dredge and possibly pipelines, equipment barges, marker buoys, and small tugs. Dredging would temporarily affect water quality by increasing local turbidity levels around the dredging sites. Increased water column turbidity during sand excavation would be temporary and localized. The spatial extent of elevated turbidity is expected to be within 1,000 meters of the operation, with turbidity levels returning to ambient conditions within a few hours after completion of the dredging activities. Therefore, no significant long-term impacts to water quality are expected to occur. Elevated turbidity levels resulting from construction should not have a significant negative effect on organisms inhabiting the area.

Given the naturally dynamic waters of the Gulf of Mexico coast, organisms inhabiting the offshore areas adapt well to reasonable environmental changes such as moderate increases in turbidity. Fish and other mobile species may temporarily leave the dredging site if turbidity becomes too great. Dredging activities would result in significant mortality of non-motile benthic organisms. No significant impacts to managed species of finfish or shellfish populations are anticipated from the borrow area excavation operations.

4.4 COASTAL DUNE LAKES

These lakes are positioned behind the dune systems throughout the county. Upland drainage feeds the coastal dune lakes that intermittently breach the dune system and discharge directly into the Gulf of Mexico. Their characteristic and sustenance is dependent upon the periodic breaching process. The lakes support a variety of coastal wildlife with natural communities unique to this region. Engineering design for the shoreline restoration must be cognizant of the dune lake processes. Breaching conditions are dependent upon fronting beach elevation rather than beach width. Any berm and dune placement in the vicinity of the lakes must be conducted in a manner that will preserve the intermittent breaching processes. Beach placement design will be such as to not increase berm elevations in the immediate vicinity of the dune lake outfalls.

To avoid impacts to the natural dune lake breaching process, construction of the selected Federal plan does not include placement of dunes or berm in front of the coastal lake outfalls. The proposed beach fill design for the sponsor's local plan discussed in Section 2.1.4 includes maintaining the natural berm elevations and providing a 100-ft buffer east and west of the existing outfall channel banks with a fill shall slope 1V:15H from the design elevations of the construction template to the existing grade at the buffer zone locations. The avoidance of placing material in front of the lake outfalls was determined to be an acceptable solution by the Florida DEP in the completed Joint Coastal Permit (JCP) application package that was submitted and coordinated for the local plan by the local sponsor. This solution has also been accepted by the other supporting agencies as part of the completed coordinations. Since the proposed NED plan and LPP is considerably smaller and falls completely within the local plan, this same avoidance design has been adopted for the selected Federal plan and has been included in Federal JCP permit application and all other required coordinations.

4.5 SEDIMENT COMATIBILITY

Shoreline storm protection and restoration activities that artificially place sand on the beach from remote sources must use sand similar to the native beach sand in order to preserve the beach's natural characteristics to the maximum extent practicable. The physical characteristics of the borrowed

material including mineral composition, grain size, and color must be matched as closely as possible with the native beach sand. Geotechnical investigations have been conducted to identify and select a suitable borrow site that contains the necessary volumes and exhibit the required characteristics of the Walton County beach systems. Analysis of native beach sand samples were used to determine the grain size distributions, composition, and compaction characteristics at representative locations. Such beach sand characteristics have been identified as important turtle-nesting parameters.

The geotechnical investigations also involve a two-phased sand source investigation, which explored the offshore sediments and identified the borrow area for use by both the local and Federal plans. The first phase, reconnaissance level, searched three areas that included region-wide offshore areas, an offshore sand ridge, and a potential source in a nearby ebb tidal shoal. The results of these investigations were used to define selected borrow area for the Walton County beach restoration activities.

Compatibility of the sand is expressed quantitatively in terms of size and composition of the borrow area sediments with the native beach sediments in terms of an adjustment or overfill factor which is defined as the volume of material required to produce a unit volume of stable beach with the same grain size distribution as the native beach. The method developed by Dean (2002), which applies the concept of equilibrium beach profiles, computed an overfill ratio of 1.0. The overfill ratio between the borrowed and beach sand indicates that the borrow material and the native beach have very similar characteristics in composition and mean grain size, which is about 0.30 mm (Taylor Engineering, 2003). Because the same borrow site investigated for the local plan is being used for the selected Federal plan and placement areas are essentially the same, this analysis directly applies and has been used for the compatibility determination for the selected Federal Plan and included in the Federal JCP application package.

As discussed in Section 4.2 above, the material to be utilized during restoration of the beach meets the criteria set forth in 20 CFR 230.60(b) as clean sand which is sufficiently removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the material would not be contaminated by such pollution. Hence, no further physical, biological, or chemical testing is required pursuant to the 404(b)(1) Guidelines. More specific details pertaining to sediment quality is included in the 404(b)(1) Evaluation Report included in EA-APPENDIX A.

It must be considered that any proposed borrow areas located within the outer continental shelf (i.e., 3 miles offshore) will require authorization from the Department of Interior, Minerals Management Service (MMS). However, no borrow areas are being considered that fall under MMS jurisdiction. Results of

the geotechnical investigations are presented in Appendix D of the AFB Main Report.

4.6 THREATENED AND ENDANGERED SPECIES

Construction of the project will likely be conducted using hopper dredging equipment and/or hydraulic pipeline equipment. Coordination for using hopper dredging operations has already been analyzed and coordination for the Gulf of Mexico in the November 19, 2003 Regional Biological Opinion (RBO) entitled "Dredging of the Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges (Consultation Number F/SER/2000/01287). Another related programmatic biological opinion (PBO) is pending for placement of sand on Florida beaches and anticipated to be in place in early 2010. This PBO, however, will not include a determination for the piping plover which will require separate coordination. Dredging and placement activities associated with the selected Federal plan will be conducted in accordance with these biological opinions.

Until the PBO mentioned above is in place, coordination with the FWS is required and has been initiated in accordance with the Endangered Species Act (ESA). Species of concern within the project area include sea turtles, Gulf sturgeon, Florida manatee, Choctawhatchee beach mouse, and piping plover (as well as other avian species).

As mentioned earlier in Section 2.1.5 the local sponsor for this project has proceeded with pursuing beach restoration on their own with a local plan that totally envelopes the selected Federal plan. Subsequently, the sponsor has already initiated the processes of coordinating for threatened and endangered species. As a result of their formal consultation, a biological opinion (BO) has been issued from the FWS in accordance with Section 7 of the ESA for their local plan. The determination and conditions specified in the BO are consistent with and typical of other beach restoration projects in the area. This existing BO for the local plan has made the following determinations that the proposed local plan is not likely to:

- jeopardize the continued existence of sea turtle
- jeopardize the continued existence of the Choctawhatchee beach mouse (CBM)
- destroy or adversely modify CBM critical habitat
- jeopardize the continued existence of non-breeding piping plover

The local sponsor also completed formal Section 7 consultation with the NMFS and has received a letter of concurrence which states that the proposed local plan:

- Should observe and adhere to the terms and conditions of the RBO for hopper dredging
- Is not likely to adversely affect sea turtles and Gulf sturgeon
- Is not likely to adversely affect modify Gulf sturgeon critical habitat
- In not likely to adversely affect any other listed species under the NMFS purview

Although the coordination efforts already conducted by the sponsor for the local plan that totally encompasses the selected Federal plan, the Corps has, in addition, initiated formal Section 7 consultation with the FWS and NMFS. A biological assessment (BA) has been prepared using much of the same information generated by the local sponsor addressing the potential impacts to the listed species and/or critical habitats within the selected Federal plan. It is expected that the same activities will be required to avoid or minimize impacts to these species or where possible to provide activities that may enhance the species continued survival or critical habitat. Given the results of the coordinations by the local sponsor, no additional issues are expected associated with the selected Federal plan.

In addition to the formal ESA consultations being conducted, the Fish and Wildlife Coordination Act (FWCA) requires that federal agencies consult with the USFWS with regarding fish and wildlife resources in the project area. Such coordination will result in a Fish and Wildlife Coordination Act Report. This consultation has been initiated for the selected Federal plan.

4.6.1 Sea Turtles. The effects of beach disposal and impacts on nesting sea turtles has been extensively documented and indicate that, in nesting success rates may decrease the year following beach placement as a result of escarpments, altered beach profiles, and sand compaction. All efforts will be made to conduct the proposed dredging and placement activities outside of the sea turtle nesting window. Additionally, the conservation measures and recommendations specified in the RBO for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges will be followed to the maximum extent practicable. However, it is inevitable that some of the placed sand will remain on the beach during subsequent nesting seasons. Given these considerations it is determined that the proposed action may adversely affect sea turtles and the pending PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.6.2 Gulf sturgeon. Effects to Gulf sturgeon resulting from the proposed dredging and disposal activities would be confined to direct impacts associated with the dredge equipment at the offshore borrow site. Effects resulting from the use of hopper dredges were considered in the RBO. Mobile District will abide by the reasonable and prudent measures set forth in that opinion. No effects to Gulf Sturgeon are anticipated with the use of a hydraulic cutter-head dredge, as they are not known to impact Gulf Sturgeon. The pending

PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.6.3 West Indian Manatee. Manatees may be occasionally found in the shallow waters of the project area during the warmer months of the year. Given their slow-moving and low visibility nature, it is possible that manatees could wander into close proximity of the dredging and placement operations. To minimize contact and potential injury to manatees, the Manatee Construction Conservation Measures as specified by the FWS will be strictly observed. In addition, there will be NMFS approved observers on board all hopper dredge operations. The pending PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.6.4 Piping Plover. The beach placement proposed during this action may actually enhance beach habitat and even potentially restore lost habitat in the long term. However, short-term impacts to foraging and roosting habitat may occur during beach construction operations. Since piping plovers do not nest in Florida, construction activities will not impact breeding and nesting activities. Wintering habitat for roosting and foraging may be impacted; however, project construction limits will avoid areas designated as critical habitat area to the maximum extent practicable. Direct short-term foraging habitat losses may occur during the placement of sediment on the beach and associated construction operations. Since only a small portion of the foraging habitat is directly affected at and around the discharge site, adjacent habitat is still available and the overall direct loss of foraging habitat will be minimal and short-term. However, the placement of sediment on the beach may temporarily impact foraging, sheltering, and roosting habitat. The terms and conditions resulting from formal consultation for the selected Federal plan will be observed.

4.6.5 Choctawhatchee Beach Mouse (CBM). Direct beach placement of compatible sand may enhance existing habitat or establish new habitat for beach mice. However, recent hurricane activity has eroded a significant portion of the primary dune and bluff systems throughout Walton County. It is not known at this time where dune vegetation is beginning to re-establish itself prior to construction of the project. With these considerations in mind and the uncertainties associated with the direct beach and dune placement there may be some impacts to the CBM during project construction. The pending PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.7 CRITICAL HABITATS

4.7.1 Gulf sturgeon. The proposed beach restoration area falls within the designated Gulf sturgeon Florida Nearshore Gulf of Mexico critical habitat. This area falls under the jurisdiction of the National Marine Fisheries Service (NMFS). Consultation with NMFS regarding the effects of the proposed

action on Gulf sturgeon and subsequent potential modification to Gulf sturgeon critical habitat has been initiated for the selected Federal plan. Direct placement of beach material will increase shoreline width and extend into the critical habitat area. The increased width is intended to restore the shoreline position to pre-hurricane positions and believed not to have an effect on critical habitat areas. The pending PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.7.2 Choctawhatchee Beach Mouse (CBM). The direct dune and beach placement is adjacent to designated critical habitat for the Choctawhatchee beach mouse. The placement of sediment directly on the beach and seaward of the toe of the existing primary dune line would not generally impact existing habitat. Pipeline routes for beach construction will typically avoid identified primary constituent elements for critical habitat. Considering that much of the mature coastal barrier sand dunes and scrub dune habitat on the Gulf and Atlantic coasts of Florida have been lost and populations of beach mice have declined as a result, the development of new habitat or enhancement of existing habitat is beneficial to the recovery goals of beach mice. Dune restoration activities allows for the availability of materials for the natural formation and growth of primary and secondary dunes. Such processes would help in the development of new beach mouse habitat and may aid in the enhancement and expansion of existing populations by stabilizing and enhancing existing dune communities with available sand and associated aeolian transport processes. This in turn promotes natural recruitment of native dune vegetation that contributes to the primary constituent elements for critical habitat by providing food resources for beach mice. Consultation with FWS regarding the effects of the selected Federal plan on CBM critical habitat has been initiated. The pending PBO for sand placement on Florida beaches or other resulting BO's will be observed for the selected Federal plan.

4.8 ESSENTIAL FISH HABITAT

As discussed in Section 3.0, the proposed borrow and placement areas serve as habitat various species identified in **Table 3**. It is believed that the proposed action will not fill or destroy habitat considered necessary to sustain these species. Coordination with the NMFS, Protected Species Management Branch in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) has been initiated involving the dredging and placement activities for selected Federal plan. Activities have been undertaken to assure that plans identified for this study are not in conflict with existing Federal fishery management plans or do not result in unacceptable impacts to the habitats of managed species.

Material will be removed from the selected borrow area via hopper dredge and pumped onto the beach to create the desired template. This method is preferable in terms of turbidity reduction and minimizing the potential impact to

fish and wildlife. Most of the motile benthic and pelagic fauna, such as crab, shrimp, and fish, should be able to avoid the disturbed area and should recover shortly after the activity is completed. The selected borrow area is characterized as sandy bottom and does not contain any hard-bottoms, coral reefs, oyster beds, or seagrasses. No long-term direct impacts to managed species are anticipated. However, it is reasonable to anticipate some non-motile and motile invertebrate species will be physically affected through the dredging and placement operations. These species are expected to recover rapidly soon after the disposal operations are complete.

4.9 COASTAL BARRIER RESOURCES

The Coastal Barrier Resources Act of 1982 (PL 97-348) restricts Federal expenditures and financial assistance within designated CBRA zones in the Gulf and Atlantic Coasts. Several CBRA units are located within the project area. Those CBRA units include FL-94, FL-96, FL-95P, FL-93P, P32, and P31A as illustrated in **Figure 8**. Coordination with the FWS concerning the consistency of the selected Federal plan in accordance with the requirements of CBRA for the six system units has been initiated to ensure that the expenditure of Federal funds does not enhance the potential for development within these units. It is believed that the activities within these units are considered as protective measures to fish and wildlife resources which are exempt under CBRA.

4.10 WATER QUALITY

Some silty material will be associated with the dredging and placement operations and its suspension may result in a slight localized increase in turbidity at the dredging and disposal sites. The direct placement of material on the beach will consist of beach quality sandy and no significant long-term elevation of turbidity is expected. The State of Florida's water quality standards would not be significantly affected and water clarity would return to ambient conditions shortly after sediment placement at the dredge and disposal sites. As required by the Clean Water Act, a Section 404 (b)(1) evaluation report for the borrow and placement of sediment at the proposed beach placement areas has been prepared and can be found in EA-APPENDIX A.

4.11 SEDIMENT QUALITY

As discussed in Section 4.2 above, the material to be utilized during restoration of the beach meets the criteria set forth in 20 CFR 230.60(b) as clean sand which is sufficiently removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the material would not be contaminated by such pollution. Hence, no further physical, biological, or chemical testing is required pursuant to the 404(b)(1) Guidelines. More specific details pertaining to sediment quality is included in the 404(b)(1) Evaluation Report included in EA-APPENDIX A.

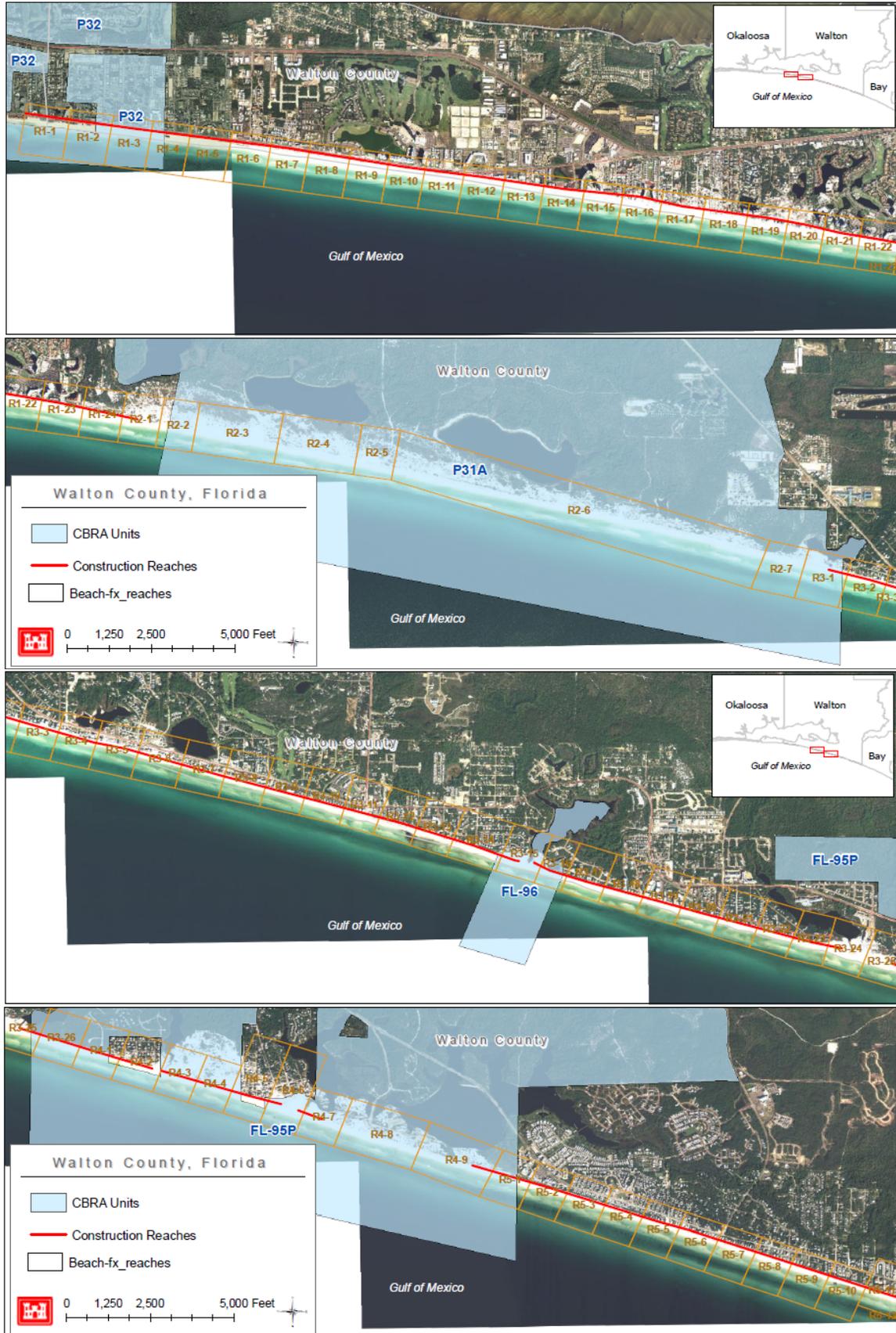


Figure 8. Locations of CBRA Units P32, P31A, FL-96 and FL-95P in relation to the project area.



Figure 8 (continued) - Locations of CBRA Units FL-94 and FL-93P in relation to the project area.

As stated in Section 3.5, a compatibility analysis was conducted by Taylor Engineering (2003). Borrow area and beach samples were taken to compare provide a comparison between the beach and proposed borrow area. Compatibility is expressed by the quantitative characteristics (size and composition) of the borrow area sediments with the native beach sediments in terms of an adjustment or overfill factor. This overfill factor is defined as the volume of material required to produce a unit volume of stable beach with the same grain size distribution as the native beach. The method developed by Dean (2002), which applies the concept of equilibrium beach profiles, computed an overfill ratio of 1.0. The analysis indicates that the borrow material and the native beach have equal mean grain sizes (0.30 mm).

4.12 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE

No known hazardous, toxic or radioactive waste concerns are known to exist within the confines of the project area. Nor would any be added as a result of the proposed activities. The material to be excavated are naturally occurring marine sands in areas of high current activity and far removed from sources of pollution, thus providing reasonable assurance that the material is not contaminated. The material to be utilized during restoration of the beach meets the criteria set forth in 20 CFR 230.60(b) as clean sand which is sufficiently

removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the material would not be contaminated by such pollution. Hence, no further physical, biological, or chemical testing is required pursuant to the 404(b)(1) Guidelines. More specific details pertaining to sediment quality is included in the 404(b)(1) Evaluation Report included in EA-APPENDIX A.

4.13 AIR QUALITY

Air quality would be temporarily and insignificantly affected by the proposed action in Walton County. Emissions are expected to occur and would result from the operation of the dredge, land-based equipment, and any other support equipment which may be on or adjacent to the construction areas. The project area in Walton County is currently in attainment with National Ambient Air Quality Standards parameters. The proposed action would not affect the attainment status of the project area or region. A State Implementation Plan conformity determination (42 United States Code 7506 (c)) is not required since the project area is in attainment for all criteria pollutants.

4.14 NOISE

Noise from the dredge and other associated support equipment would be evident in the project area. Noise levels would be typical of what is already commonly accepted and occurring at the Corps' dredging operation sites. While this noise would be evident to those workers on the job, residents, and bystanders in close proximity of the project, it would be short-term and insignificant. No long-term increase in noise would occur in or around the project area. Normal noise levels would be achieved at the end of the construction period.

4.15 AESTHETICS

Esthetics would be degraded in the project area during the dredging and disposal operations, due to the physical presence of the dredge and pipeline used to transport the dredged material as well as the presence of other land-based equipment. Some minor increases in turbidity may be noted in the immediate vicinity of excavation and placement activities but these increases would be minor and short term in nature. Some discoloration of the sand would occur following placement due to the fact that the sands to be placed on the beach are coming from an anaerobic environment. Bleaching of the sand should occur within one to two months. Rainfall and wave action would act to filter out the fine grained materials from the restored beaches and increase the compatibility of the nourishment sands with those presently on the beach. These impacts would be temporary and insignificant in nature.

4.16 RECREATION

For a short time, the construction process would limit the recreational activities, especially near the dredge pipe and equipment staging areas. Once completed, the project would provide an aesthetically pleasing larger beaches and vegetated dunes which would supply more area for active and passive recreational activities as attracting coastal wildlife.

4.17 HISTORIC AND CULTURAL RESOURCES

In accordance with Section 106 of the National Historic Preservation Act and other relevant cultural resource laws, recommendations and actions will be coordinated with the FLSHPO and appropriate Federally recognized American Indian tribes. Plans to avoid or conduct more intensive evaluations of any cultural resources identified during the surveys will be developed and coordinated.

Sonographics, Inc under contract to the county conducted a cultural resource survey and detail phase sub-bottom seismic survey for the offshore areas and proposed borrow sites of Walton County in June 2007. Potential identified cultural resources were investigated using qualitative visual observations. It was determined that none of the anomalies detected appeared to represent any type of cultural resources and a determination was made that the activities associated with this project are unlikely to affect any historic or cultural resources. The county subsequently initiated coordination with the Florida Division of Historic Resources presenting this determination. In a letter dated December 11, 2008, concurrence was issued by the Florida Division of Historic Resources for the local project. A copy of this letter is included in **EA - EA-APPENDIX B**. It should be understood that this determination issued for the local plan covers the same areas as the selected Federal plan.

4.18 SOCIO-ECONOMIC IMPACTS

The selected Federal plan would not require business or residential relocations. The proposed action would likely have a negligible effect on population growth trends within Walton County. As a result of the proposed action is not expected to increase demands for community facilities, services, and housing other what would be expected as consistent with the projected population growth for Walton County and would not result in potentially significant impacts.

4.19 CUMULATIVE EFFECTS SUMMARY

Cumulative impacts are those impacts on the environment that result from the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or

non-federal) or person undertakes such other actions. This section analyzes the proposed action as well as any connected, cumulative, and similar existing and potential actions occurring in the area surrounding the site.

No projects are known to be interdependent upon this project. It is likely that renourishment events in the action area would occur in the future to maintain the beach design profile and additional sand sources would be used. Renourishment is expected to occur at regular intervals with increasing occurrence if the area is impacted by tropical storm events. Several other known beach renourishment are occurring, have recently occurred or are expected to occur within the Florida Panhandle. These include: Pensacola Beach Restoration (8.2 miles of shoreline), Navarre Beach and Dune (3.6 miles of shoreline), and City of Destin Beach renourishment (6.9 miles of shoreline and a 210 acre borrow area). In addition there is a proposed sand bypassing unit for the Mexico Beach Canal which is currently within the FDEP permitting process. This project, if approved, would consist of annual bypassing of sand via a hydraulic dredge from a 1.6 acre beach site west of the pass to a 4,500 foot stretch of beach to the east. The combined footprint is approximately 514 acres of seafloor and 37 miles of the shoreline. Not all of these projects are expected to occur within the same renourishment cycle (year), thus providing time for the natural system to recover. Cumulative impacts that would arise from renourishment efforts are anticipated to be remote due to the conservation measures typically incorporated into beach nourishment projects and the dynamic nature of the nearshore zone and the rapid recovery time of the benthic assemblages.

5.0 STATUS OF ENVIRONMENTAL COMPLIANCE

5.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA) OF 1969

Environmental information on the selected Federal plan has been compiled and this EA has been prepared in accordance with the NEPA. Upon finalization of this EA a determination will be made as to the significance of the impacts resulting from this project. If it is found that the total impacts are not considered significant, a Findings of No Significant Impacts (FONSI) will be prepared. If impacts are determined to be major, an EIS will be initiated. See Section 6.0 referencing the determination for the preparation of an EA. A public notice as required under NEPA has been prepared and distributed for the selected Federal plan.

5.2 ENDANGERED SPECIES ACT OF 1973

The selected Federal plan as described in Section 2.1.4 is in the process of formal consultation in accordance with the USFWS and NMFS as required under Section 7 of the ESA. Although the coordination efforts already conducted by the sponsor for the local plan that totally encompasses the selected Federal plan, the Corps has, in addition, initiated formal Section 7 consultation with the

FWS and NMFS. A BA have been prepared for consultation with both the FWS and NMFS prepared using much of the same information generated by the local sponsor addressing the potential impacts to the listed species and/or critical habitats within the selected Federal plan. A copy of the BA's is included in EA-APPENDIX B. It is expected that the same activities will be required to avoid or minimize impacts to these species or where possible to provide activities that may enhance the species continued survival or critical habitat.

Based on the evaluation for species and critical habitats under the purview of the FWS for the selected Federal plan described in the BA, it is the Corps' assessment that the actions may have an adverse affect on sea turtles, piping plovers, and CBM. Upon further consideration of the previous BO issued for the local Walton County Beach Nourishment Project, it is the FWS's opinion that the effects of the proposed activities are not likely to jeopardize the continued existence of these species and not likely to destroy or adversely modify designated critical habitat for the CBM. Given the results of the coordinations by the local sponsor, no additional issues are expected associated with the selected Federal plan.

Based on the evaluation for species and critical habitats under the purview of the NMFS for the selected Federal plan described in the BA, it is the Corps' assessment that the actions may have an adverse affect on sea turtles and Gulf sturgeon but not likely to jeopardize their continued existence and is not likely to adversely modify Gulf sturgeon critical habitat. This determination is consistent with the completed consultation conducted for the local plan in which NMFS has concurred in a letter dated August 13, 2008. A copy of this letter is included in EA-APPENDIX B. The Corps is therefore requesting that consideration be given to applying that coordination to the selected Federal plan. Given the results of the coordinations already completed by the local sponsor, no additional issues are expected associated with the selected Federal plan.

In addition to the coordinations described above, hopper dredging operations have already been analyzed in the RBO and amendments. Another related biological opinion is pending for placement of sand on Florida beaches and is anticipated to be in place by the time this project is constructed.

5.3 COASTAL ZONE MANAGEMENT ACT OF 1972

As previously stated, the sponsor proceeded with pursuing the beach restoration and has selected a local plan that totally envelops the selected Federal Plan. The County has applied for the state WQC/CZC in which the Florida DEP has deemed their application complete but the final permit has not been issued. The state has indicated that since the local plan in larger than and totally encompasses the selected Federal plan that ownership of the completed WQC/CZC application can be transferred to the Corps. A letter of transfer of the application must be submitted to the state by the local sponsor and the Corps. The only thing that would be necessary is to replace the project description for

the local plan with the selected Federal plan. The Corps is currently coordinating this effort with the local sponsor.

The Corps determined that the proposed action is consistent with the Florida Coastal Management Program to the maximum extent practicable. The effect of this project on the coastal zone would be to enhance the zone's appearance and suitability for beach-type recreation and to restore some of the coastal zone's ability to provide protection against storms and flooding. Restoration of the State's beaches is a policy statement with the state Coastal Zone Management Plan Chapter 161 (Coastal Construction). A Coastal Zone Consistency (CZC) request is included in the Federal JCP application package that has been prepared and will be issued along with the JCP permit. This application has been prepared utilizing much of the information generated by the sponsor for the local plan and submitted to the State of Florida for final consideration.

5.4 CLEAN AIR ACT OF 1972

No air quality permits are required for this project.

5.5 CLEAN WATER ACT OF 1972

A Section 401 water quality certification has been requested from the Florida Department of Environmental Protection (FDEP) for the selected Federal plan. A Section 404 (b)(1) evaluation report is included in this EA under EA-APPENDIX A.

As already discussed, the sponsor proceeded with pursuing the beach restoration and has selected a local plan that totally envelops the selected Federal Plan. The state has indicated that since the local plan is larger than and totally encompasses the selected Federal plan that ownership of the completed WQC/CZC application can be transferred to the Corps. A letter of transfer of the application must be submitted to the state by the local sponsor and the Corps. The Corps is currently coordinating this effort with the FDEP and local sponsor.

5.6 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (PL 89-665, THE ARCHEOLOGY AND HISTORIC PRESERVATION ACT (PL 93-291), AND EXECUTIVE ORDER 11593)

Archival research and field work has been initiated by the local sponsor. Sonographics, Inc conducted a cultural resource survey and detail phase sub-bottom seismic survey in June 2007. Potential identified cultural resources were investigated using qualitative visual observations. It was determined that none of the anomalies detected appeared to represent any type of cultural resources and a determination was made that the activities associated with this project are unlikely to affect any historic or cultural resources. The county subsequently initiated coordination with the Florida Division of Historic Resources presenting

this determination. In a letter dated December 11, 2008, concurrence was issued by the Florida Division of Historic Resources for the project. This determination covers the same areas as the selected Federal plan. Section 106 consultation has been initiated for the Federal plan using this existing information.

In accordance with Section 106 of the National Historic Preservation Act and other relevant cultural resource laws, recommendations and actions have been coordinated with the FLSHPO. The Mobile District's cultural resources staff has composed a letter indicating that the Mobile District has reviewed the aforementioned cultural resources survey and review by the FLSHPO. Based on this information, and the nature of the project, the Mobile District, as lead Federal agency, has determined that the selected Federal plan will have no effect on historic properties as per 36 CFR 800.4(d)(1). A copy of this coordination is included in EA-APPENDIX B.

5.7 MIGRATORY BIRD TREATY ACT

No migratory birds would be adversely affected by project activities.

5.8 COASTAL BARRIER RESOURCES ACT (CBRA) AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

The CBRA Units that are within the project limits include FL-94, FL-96, FL-95P, FL-93P, P32, and P31A. Coordination with the FWS concerning the consistency of the selected Federal plan in accordance with the requirements of CBRA for the six system units has been initiated to ensure that the expenditure of Federal funds does not enhance the potential for development within these units. A copy of the coordination document is included in EA-APPENDIX B.

CBRA units 95P and FL-93P are considered as otherwise protected areas (OPA) and only applies to Federal flood insurance which does not apply to this project. CBRA unit P32 falls within a segment of the project that cannot be justified for Federal funding and will be 100% locally funded, which is exempt from CBRA requirements. The Corps believes that the selected Federal plan qualifies for an exemption under Section 6 Exemptions for CBRA units P31A, FL-96, and FL-94. Section 6(a)(6)(A) identifies projects relating to the study, management, protection, or enhancement of fish and wildlife resources and habitats, including recreational projects. Section 6(a)(6)(G) also exempts nonstructural projects for shoreline stabilization that are designed to mimic, enhance, or restore natural stabilization systems.

5.9 MAGNUSON FISHERY CONSERVATION AND MANAGEMENT ACT

Coordination with the NMFS, Habitat Conservation Division in accordance with the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) has been initiated involving the dredging and placement activities for selected Federal plan. Activities have been undertaken to assure that plans identified for this study are not in conflict with existing Federal fishery management plans or do not result in unacceptable impacts to the habitats of managed species.

The Corps will be adhering to water quality requirements under the conditions specified by the Florida Department of Environmental Protection (DEP) to further reduce impacts to EFH. Consultation with the NMFS, Habitat Conservation Division concerning EFH has been initiated for the selected Federal plan pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (PL 94-265). A copy of the coordination documentation is included in EA-APPENDIX B. Based on the Corps' assessment of the project in relation to impacts to fisheries resources, the overall impact to identified species is considered negligible given the relatively small area and will not result in significant impacts to EFH.

5.10 FISH AND WILDLIFE COORDINATION ACT OF 1958, AS AMENDED

Although the local sponsor has conducted the coordination required by the ESA, the Fish and Wildlife Coordination Act (FWCA) requires that federal agencies consult with the USFWS regarding fish and wildlife resources in the project area. Such coordination will result in a Fish and Wildlife Coordination Act Report. This coordination has been initiated with the FWS for the selected Federal plan in accordance with the FWCA of 1958 regarding impacts to significant fish and wildlife resources and impacts to federally listed or proposed species or their designated or proposed critical habitat, which is in accordance with Section 7 of the Endangered Species Act of 1973. A copy of the coordination letter is included in EA-APPENDIX B. Such activities will be undertaken through a transfer of funds agreement. The Mobile District staff is currently working with the FWS to prepare a scope of work for these required efforts. Such a scope would include a project description, schedule, and level of funding.

5.11 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

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

5.12 E.O. 11988, PROTECTION OF CHILDREN

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

5.13 E.O. 11990, ENVIRONMENTAL JUSTICE

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

6.0 PREVIOUS INTERAGENCY COORDINATION

On 29 June 2004, an interagency scoping meeting was held at the Walton County, Tourist Development Council facility in Santa Rosa Beach, Florida. The purpose of the meeting was to initiate environmental coordination with the interagency team involved in the permitting and environmental compliance processes for the Walton County Shore Protection Feasibility Study. The meeting’s primary objects were to identify and discuss environmental issues and opportunities, permitting issues, and environmental compliance requirements associated with the proposed Walton County project. In attendance were representatives from the Corps, Walton County, FWS, FDEP, and Florida Fish and Wildlife Conservation Commission (FWCC). It should be noted that representatives from the NMFS were invited to participate. Communications with the NMFS, Habitat Conservation Division expressed that the project did not raise issues that would require their representation. Representatives from the NMFS, Protected Resources Division did not respond. A Memorandum for Record (MFR) summarizing the meeting was prepared and distributed. A copy of the MFR is included in EA-APPENDIX B.

An important topic of discussion at the interagency meeting dealt with the NEPA process that should be conducted for the Walton County project, specifically whether the project would require an Environmental Assessment (EA) or Environmental Impact Statement (EIS). The FWS expressed that their agency is not viewing this project as one that would require an EIS. Although the project area encompasses some 26 miles of shoreline, the activities will be comprised of segmented beach nourishment and/or dune restoration. The group in attendance felt that given the project characteristics, low level of controversy, and

precedent set by other local beach projects that an EA would be the appropriate level of environmental documentation for the Walton County project. However, an EA must adequately address the cumulative impacts of the entire project and may be subject to future change into an EIS should any major issues and controversy arise. If the EA results in a finding that no significant resources would be impacted by the proposed actions, a FONSI will be prepared.

The Corps has reopened communications with the interagency team to reaffirm this determination. Reaffirmation has been received from the team that their position is that an EA would still be the appropriate level of NEPA documentation. The FWS, in an email dated December 9, 2009 concurs that with the information available an EA is still the appropriate level of NEPA documentation. Also in an email dated December 9, 2009, Florida DEP has indicated that they feel the determination as to the appropriate level of NEPA documentation is the Corps' decision as long as it adequately addresses the information outlined in the JCP application package. A conference call was held on December 16, 2009 between Corps representatives and Ntale Kajumba and Paul Gagliano from EPA Region IV. After describing the project and answering several questions the EPA representatives felt that the Corps was justified in the determination to generate an EA. They also confirmed that this decision is the responsibility of the Corps. However, the information contained in the EA must support the determination for the FONSI. If the EA reveals significant impacts, then an EIS must be initiated.

The Mobile District maintains the position that based on project characteristics, low level of controversy, absence of chemical contamination, and precedent set by other local beach projects that an EA would be the appropriate level of NEPA documentation for the Walton County project.

7.0 CONCLUSIONS

All reports, documents, and coordination efforts to date have been reviewed by the Mobile District to ensure that they are in total compliance with Federal requirements including the guidelines set forth under the Environmental Operating Procedures (EOP) and the processes in ER 110502-100. Upon verification that all requirements are met and a determination has been made that the project will not result in significant environmental impacts, a FONSI will be prepared by the Mobile District for inclusion in the final feasibility report.

Based on the above discussion of the minor impacts, which would result from the implementation of the proposed action and due to the lack of long-term adverse impacts, it is believed that no significant cumulative impacts for the proposed downdrift disposal site and adjacent shoreline would occur. Upon finalization of this EA a Findings of No Significant Impacts (FONSI) will be prepared.

REFERENCES

Cutler, J.K. and Mahadevan, S. 1982. *Long-Term Effects of Beach Nourishment on the Benthic Fauna of Panama City Beach, Florida*. Miscellaneous Report No. 82-2. U.S. Army Corps of Engineers Coastal Engineering Research Center, Fort Belvoir, VA.

Dean, R.G. 2002. *Beach Nourishment, Theory and Practice*. World Scientific, River Edge, NJ.

Florida Environmental Protection, Bureau of Beaches and Coastal Systems. 2004. *Beach and Dune Erosion and Structural Damage Assessment and Post-storm Recovery Plan for the Panhandle Coast of Florida*, Report, Tallahassee, Florida.

Saloman, C.H. and Naughton, S.P. 1984. *Beach Restoration with Offshore Dredged Sand: Effects on Nearshore Macroinfauna*. Technical Memorandum NMFS-SEFC-133. National Oceanic and Atmospheric Administration, Washington, D.C.

Saloman, C.H. 1976. *The Benthic Fauna and Sediments of the Nearshore Zone off Panama City Beach, Florida*. Miscellaneous Report No. 76-10. U.S. Army Corps of Engineers Coastal Engineering Research Center, Fort Belvoir, VA.

Taylor Engineering, Inc. 2005. *Beach Management Feasibility Study for Walton County and Destin, Florida*, Report for Walton County and Destin Florida, Jacksonville, Florida

U.S. Fish and Wildlife Service. 1987. *Choctawhatchee Beach Mouse, Perdido Key Beach Mouse, and Alabama Beach Mouse Recovery Plan*. U.S. Fish and Wildlife Service, Atlanta, GA.

Wolfe, S.H., Reindenauer, J.A., and Means, D.B. 1988. *An Ecological Characterization of the Florida Panhandle*. U.S. Fish and Wildlife Service Biological Report 88(12); Minerals Management Service OCS Study/MMS 88-0063.

EA-APPENDIX A

**DRAFT 404(b)(1) EVALUATION REPORT
FOR
WALTON COUNTY, FLORIDA HURRICANE AND
STORM DAMAGE REDUCTION PROJECT
WALTON COUNTY, FLORIDA**

**404(b)(1) EVALUATION REPORT
FOR
WALTON COUNTY, FLORIDA HURRICANE AND
STORM DAMAGE REDUCTION PROJECT
WALTON COUNTY, FLORIDA**

I. PROJECT DESCRIPTION

Please refer to the figures included in the environmental assessment to which this evaluation is appended.

a. Location. Walton County is located approximately 103 miles east of Pensacola, Florida and 98 miles west of Tallahassee, Florida. The beaches of Walton County encompass approximately 26 miles of shoreline extending from the City of Destin in Okaloosa County, Florida (about six miles to the east of East Pass) to the Walton/Bay County line near Phillips Inlet (**Figure 1** in EA). The western two-thirds of Walton County are comprised of a coastal peninsula extending from the mainland, and the eastern third is comprised of mainland beaches. Choctawhatchee Bay lies north of the peninsula. Walton County includes 11.9 miles of state-designated critically eroding areas and three Florida State Park areas that cover approximately six miles of the 26-mile shoreline.

b. General Description of Proposed Preferred Plan. The Walton County upland cross section is defined by dune elevations ranging from +9.5 to + 33 feet NAVD88 and a natural berm elevation of +5.5 feet NAVD88. The study region was divided into five study reaches based on structural development and state park areas as illustrated in **Figure 2** in the EA. The historical and 2004 beach surveys were used to develop 11 representative profiles, which characterize the existing condition for the five study reaches. The representative profiles were identified based on similarity in shape of the upper beach profile (dune height and width, berm width, foreshore beach slope, and profile volume) and shape of the offshore profile. Because significant erosion occurred due to Hurricane Ivan in September 2004, the representative profiles were revised using the post-Ivan data to characterize the upper portion of the beach and to include the post-Ivan data in the submerged portion of the beach.

Modeling using a model called Beach-*fx* was used to simplify beach profiles representing a single trapezoidal dune, with a horizontal berm as shown in **Figure 3** in the EA. The submerged profile is represented by a series of points or an approximate functional representation. The beach variables which change with storms are dune width, dune height, berm width, and upland elevation. Constant values are upland elevation, dune slope, berm height, foreslope, and shape of the submerged profile. Thus, in response to a given storm, the berm can be eroded or accreted; the dune height and/or width can change and translate landward or seaward.

Eleven simplified beach profiles were modified for various berm and dune configurations. Maximum dune and berm widths were determined based on volumes provided by the Federal Emergency Management Agency (FEMA) post-Hurricane Ivan emergency beach nourishment. Other modeling was conducted using SBEACH to predict the response of each dune and berm configuration to the 552 storms developed for this study. Approximately 240,000 SBEACH simulations were conducted to develop the shoreline responses for the Beach-*fx* storm response database.

c. Authority and Purpose. This study was authorized by a resolution of both the United States Senate and House of Representatives, which reads as follows:

Resolution Adopted July 15, 2002, by The United States Senate:

“Resolved by the Committee on Environment and Public Works of the United States Senate, That in accordance with Section 110 of the Rivers and Harbors Act of 1962, the Secretary of the Army is requested to review the feasibility of providing beach nourishment, shore protection and related improvements in Walton County, Florida, in the interest of protecting and restoring the environmental resources on and behind the beach, including the feasibility of providing shoreline and erosion protection and related improvements consistent with the unique characteristics of the existing beach sand, and with consideration of the need to develop a comprehensive body of knowledge, information, and data on coastal area changes and processes as well as impacts from federally constructed projects in the vicinity of Walton County, Florida.

Resolution Adopted July 24, 2002, by The United States House of Representatives:

“Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That in accordance with Section 110 of the Rivers and Harbors Act of 1962, the Secretary of the Army is requested to review the feasibility of providing beach nourishment, shore protection and environmental restoration and protection in the vicinity of Walton County, Florida.

The non-Federal sponsor is the Walton County Board of Commissioners. Their central point of contact is the Director of Beach Management for the Walton County Tourist Development Council (TDC).

The purpose of this study is to assess the needs for hurricane and storm damage protection and opportunities for environmental restoration and protection along the Gulf Coast of Walton County, Florida. The purpose of this report is to document the economic investigations, engineering analyses, and environmental considerations completed to formulate a shore protection project for Walton County, Florida, which will reduce the damaging effects of hurricanes and severe storms to properties along the coast and stabilize or restore the shoreline by eliminating long-term erosion. The project will be constructible, acceptable to the public, environmentally sustainable and justified by an economic evaluation.

In addition to storm damage protection the proposed action provides environmental restoration opportunities. A report produced by the State of Florida following Hurricane Ivan (2004) to assess damages and recovery plan as a result of the storm, the state recommends an assisted recovery plan to implement beach and dune restoration and re-vegetation for the critical areas in Walton County. Such action would restore valuable dune and beach habitat including sea turtle nesting habitat, shorebird foraging and roosting areas, dune habitat supporting various flora and fauna and general beach ecosystem functions. Restoring a beach-dune system allows greater stability and sustainability of the coastal environment once it has become established. Restoring the beach habitat that supports a variety of associated flora and fauna contribute to the success and continual survival of several threatened or endangered species. The restoration effort will also contribute to the well being of various other flora and fauna that naturally occur in the immediate vicinity. Future conditions associated with not restoring the beach and dune system would result in the continued absence of a valuable beach ecosystem and loss of these types of habitats and associated benefits. The already damaged habitats would remain particularly vulnerable to wave and storm activity that continually threaten and prevent the re-establishment of valuable natural resources.

d. General Description of Borrow Material.

(1) General Characteristics of Material. The proposed borrow area sediments are typically well sorted medium sand (0.25 - 0.50 mm). The borrow area is centrally located and offers the best source for now and in the future. All materials used for beach nourishment will be excavated by hopper dredge, transported to the placement area offshore and pumped into the beach template.

(2) Quantity of Material. The proposed borrow area is believed to contain approximately 10,000,000 cubic yards proven by the initial investigations. This volume covers the initial locally preferred plan placement and the four planned subsequent re-nourishments for the next 50 years.

(3) Source of Material. Borrow area B-4 shown on Figure 5 in the EA is the most promising site.

e. General Description of Discharge Sites.

(1) Location. The proposed Walton County placement sites are located approximately 103 miles east of Pensacola, Florida and 98 miles west of Tallahassee, Florida. The beaches of Walton County encompass approximately 26 miles of shoreline extending from the City of Destin in Okaloosa County, Florida (about six miles to the east of East Pass) to the Walton/Bay County line near Phillips Inlet (Figure 1 in EA).

(2) Type of Site. The beach placement sites are typical of Florida panhandle coastal beaches and the nearshore Gulf of Mexico with predominately marine sand substrate.

(4) Types of Habitat. The beach and nearshore area at the proposed Walton County project site support a highly variable marine environment that is typical of the nearshore zones of the northwest Florida Gulf of Mexico as described in the EA. These areas are characterized by clean white sands and clear blue-green ocean waters.

(5) Timing and Duration of Discharge. Timing of project construction is not known at this time. Once constructed, however, renourishment activities are expected to be conducted at predefined intervals or as necessary depending upon storm activity. Renourishment activities would be scheduled as much as possible to coincide with environmental windows to avoid conflicts with sea turtles, shorebirds, and other protected species and critical habitats.

f. Description of Discharge Methods. All materials used for beach nourishment will be excavated by hopper dredge, transported to the placement area offshore and hydraulically pumped into the beach template. Heavy earth moving equipment such as bulldozers would be utilized to achieve the final design template. The use of hopper dredge equipment will adhere to the terms and conditions set forth within the Biological Opinions (BO) on hopper dredging in the U.S. South Atlantic and Gulf of Mexico waters (most recently, January 9, 2007, regional biological opinion (RBO) to the Corps' four Gulf of Mexico districts) would be implemented to minimize the potential of sea turtles and Gulf sturgeon take as a result of entrainment in the dredge. Placement of material on the proposed beach sites will adhere to the negotiated terms and conditions BO's resulting from the formal consultation processes and possibly already negotiated conditions specified under the Programmatic Biological Opinion (PBO) for Beach Placement and Shore Protection for the State of Florida. This PBO is not yet final but is expected to be implemented in 2010.

II. FACTUAL DETERMINATIONS (SECTION 230.11)

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The placement of material on the beach and in the nearshore areas would be accomplished in such a manner as to replicate the existing beach elevation/slope but at a distance seaward of the existing mean high water elevation as specified by the approved preferred plan. After placement, the beach fill would be subject to modifying effects of the natural wave climate of the Gulf of Mexico and within 6 months should reach equilibrium. This short term change in natural elevation and slope would not pose a significant impact to the resources of the area or circulation in the nearshore Gulf of Mexico.

(2) Sediment Type. The material to be utilized in the beach renourishment project is predominantly medium sized sand (0.25 - .50 mm) with some shell hash and less than 10 percent fine grained material. This material is compatible with the sand on the Walton County beaches and nearshore littoral zone. Mineral composition and particle size of the substrate would not be significantly altered.

(3) Dredged/Fill Material Movement. Some of the fill material is expected to be transported westward along the shoreface in the littoral drift system. This movement however, would not have any adverse impact on the area as the littoral drift is a natural occurrence and the quantity of material expected to be lost to this system is minimal compared to that which is currently in circulation.

(4) Physical Effects on Benthos. The placement of the fill material would bury the benthos of the shoreface and to some extent that of the nearshore area. These communities are well adapted to this type of phenomena and should reestablish within 6 to 12 months after placement.

(5) Other effects. No other effects are anticipated.

(6) Actions Taken to Minimize Impacts (Subpart H). Since the material to be placed is naturally occurring sand similar to the substrate of the beach nourishment site, no further actions are deemed necessary.

b. Water Column Determinations

(1) Salinity. There would be no changes in gradients or patterns.

(2) Water Chemistry (pH, etc.). The material proposed for placement is medium grained marine sand as described in the EA. These areas are far removed from any known sources of contaminants. Also, the material is primarily composed of unconsolidated quartz sand which is considered inert and in areas of high current and wave energy conditions. Such materials under high energy conditions are considered most likely free of contaminants. Based on 40 CFR 230.60, no testing for contaminants will be necessary. This sandy material is relict beach sand, and is similar to the sand found on the proposed beach disposal site.

(3) Clarity. The discharging of effluent is expected to create some degree of construction-related turbidity in excess of the natural condition in the proximity of the placement site and the borrow area. These impacts are expected to be temporary, with suspended particles settling out within a short time without measurable effects on water quality. During construction, turbidity levels would be monitored at the dredge and the beach sites, to ensure compliance with FDEP's Water Quality Certification.

(4) Color. The color of the proposed borrow sand matches that of the beach sand to the extent acceptable by the State of Florida's Sand Quality Control (QC) and Quality Assurance (QA) required by paragraph 62B-41.008 (1) (k) (4b) F.A.C.

(5) Odor. No effect.

(6) Taste. No effect.

(7) Dissolved Gas Levels. No significant effect.

(8) Nutrients. No significant effect.

(9) Eutrophication. No effects.

c. Water Circulation, Fluctuation, and Salinity Determinations

(1) Current Patterns and Circulation.

(a) Current Patterns and Flow. Neither the placement of material on the beach nor the proposed excavation is expected to result in significant changes in current patterns or circulations. In the area of proposed excavation currents would be slightly modified due to the increase depth.

(b) Velocity. No significant effects.

(2) Stratification. No significant effects.

(3) Hydrologic Regime. See (a) and (b) above. No significant effects.

(4) Normal Water Level Fluctuations. No effects.

(5) Salinity Gradient. No significant effects.

d. Suspended Particulate/Turbidity Determination.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Placement Site. The discharging of effluent is expected to create some degree of construction-related turbidity in excess of the natural condition in the proximity of the placement site and the borrow area. These impacts are expected to be temporary, with suspended particles settling out within a short time without measurable effects on water quality. During construction, turbidity levels would be monitored at the dredge and the beach sites, to ensure compliance with Florida Department of Environmental Protection's Water Quality Certification.

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

(a) Light Penetration. Slight decreases in the degree of light penetration may occur during placement activities. These impacts would be temporary in nature and restricted to the immediate area of placement.

(b) Dissolved Oxygen. No significant effects.

(c) Toxic Metals and Organics. No effects.

(d) Pathogens. No effects.

(e) Aesthetics. Only temporary degradation to the aesthetic environment would occur as a result of excavation and placement operations. Impacts would primarily occur as a result of the physical presence of heavy equipment. Some minor increases in turbidity may be observed in the immediate vicinity of excavation and placement activities but these increases would be minor and short term in nature.

(3) Effects on Biota.

(a) Primary Production Photosynthesis. No long-term significant impacts are expected to occur due to the physical nature of the material to be excavated. No submerged aquatic vegetation is located within the area of dredging or sand placement.

(b) Suspension/Filter Feeders. No significant effects. No oyster reefs, worm reefs, significant clam communities are known to be prominent within the vicinity of the project.

(c) Sight Feeders. No significant effects.

(4) Actions Taken to Minimize Impacts (Subpart H). No further actions are deemed appropriate.

e. Contaminant Determinations. The material to be utilized during restoration of the beach meets the criteria set forth in 20 CFR 230.60(b). The material is characterized as clean sand which is sufficiently removed from sources of pollution and is located in areas of high current velocities to provide reasonable assurance that the material would not be contaminated by such pollution. In addition, the material originates in the near vicinity of the placement activity and is similar to the substrate of the placement site, and receives the same overlying waters as the placement site. Hence, no further physical, biological, or chemical testing is required pursuant to the 404(b)(1) Guidelines.

f. Aquatic Ecosystem and Organism Determinations. No significant effects.

(1) Effects on Plankton. Placement of nourishment material on the Walton County beaches and the nearshore area would destroy some phytoplankton and zooplankton, and could reduce light penetration which may tend to have an effect on the primary production by the phytoplankton. Due to the nature of the materials to be placed and the duration of the placement operations, these impacts would be short-term in nature and restricted to the general vicinity of the construction activity. Total impacts to the planktonic community would not be significant.

(2) Effects on Benthos. Temporary disruption of the aquatic community is anticipated by the excavation and placement activities. The excavation and direct placement of sands from the borrow sites would result in the mortality of some percentage of the existing benthic assemblages. Non-motile benthic fauna within the area

may be destroyed by the proposed work, but should repopulate within several months after completion. Some of the motile benthic and pelagic fauna, such as crabs, shrimp, and fishes, are able to avoid the disturbed area and should return shortly after the activity is completed. Larval and juvenile stages of these forms may not be able to avoid the activity due to limited mobility.

(3) Effects on Nekton. Some fish within and in close proximity of the excavation and placement area would likely leave the area until condition return to be more favorable. However, it is not anticipated that all such organisms would vacate the area. It is logical to speculate that many organisms would avoid an area of disruption such as that associated with the placement of fill material. Some nektonic filter feeders may be killed as a result of being in the affected area and other organisms less capable of movement, such as larval forms, may be physically stressed by the placement of sand. Generally, however; most organisms would avoid the area and later return to the area. Total impacts to the nektonic community would quickly recover are not considered significant.

(4) Effects on Aquatic Food Web. No significant effects.

(5) Effects on Special Aquatic Sites. No significant effects.

(a) Sanctuaries and Refuges. Not applicable.

(b) Wetlands. Not applicable.

(c) Mud Flats. Not applicable.

(d) Vegetated Shallows. Not applicable

(e) Coral Reefs. Not applicable.

(f) Riffle and Pool Complexes. Not applicable.

(6) Effects on Threatened and Endangered Species. Pursuant to Section 7 of the Endangered Species Act, the proposed Federal action is being coordinated with the U.S. Department of the Interior, Fish and Wildlife Service, and the U.S. Department of Commerce, National Marine Fisheries Service. Such coordination has been completed for the larger local plan. The information used in this coordination has been used to conduct the consultations required for the selected Federal project. The project is located within Gulf sturgeon designated critical habitat and adjacent to critical habitats of the Piping plover and beach mice. The proposed project would not result in the likelihood of destruction or adverse modification of any critical habitat of these species. In addition to the Gulf sturgeon, Piping plover and beach mice, the surrounding area is known to support the West Indian manatee and various species of listed threatened and endangered sea turtles. The proposed project is not expected to have an effect on the beach mice and is not likely have an adverse effect on the Piping plover or Florida Manatee. The Mobile District would use Standard Manatee Protection Conditions during construction and survey for Piping plovers is expected to occur. To minimize the potential of sea turtles and Gulf sturgeon take during construction the Mobile District would continue to abide

by the terms and conditions of the following: (1) GRBO for Dredging of Gulf of Mexico Navigation Channels and Sand Mining Areas Using Hopper Dredges by COE Galveston, New Orleans, Mobile, and Jacksonville Districts, dated November 19, 2003, as amended; pending Programmatic Biological Opinion (PBO) for Beach Placement and Shore Protection for the State of Florida; and other BO's and coordination documents that will result for this effort.

(7) Effects on Other Wildlife. No significant effect.

(8) Actions to Minimize Impacts. All reasonable and prudent measures recommended by the FWS and NMFS would be initiated during excavation and placement activities.

g. Proposed Disposal Site Determinations.

(1) Mixing Zone Determination. The proposed action would comply with the zone of mixing as determined by the State of Florida. In the case of placement of material on the beach and a variance from the state mixing zone to cover specific climatic instances when the turbidity standard might be violated and will be incorporated into the WQC permit. A variance from the state mixing zone at the placement sites may be requested as part of the permitting process.

(2) Determination of Compliance with Applicable Water Quality Standards. As a result of previous WQC application activities, it is believed that the proposed Federal action would comply with applicable water quality standards. Water quality certification and consistency determination with the state coastal management plan was requested from Florida Department of Environmental Protection for a larger local plan. The state has deemed that all requirements pertaining to the application is complete and that turbidity requirements would meet the State's WQC standards

(3) Potential Effects on Human Use Characteristics.

(a) Municipal and Private Water Supply. No impacts would occur to any water supply.

(b) Recreational and Commercial Fisheries. Minor impacts to recreational and commercial fisheries could occur during the construction period. These impacts would be short term and restricted to the immediate area of construction activities.

(c) Water Related Recreation. Restoration of the beach would increase the area available for beach related water recreation. Restrictions of water-related recreational activities in the immediate areas of construction and dredging would result in short term losses of such opportunities. It has been determined that the benefits associated with the restoration of the beach outweigh these losses.

(d) Aesthetics. Only temporary degradation to the aesthetic environment

would occur as a result of the proposed action. Impact would primarily be a result of the physical presence of heavy equipment. Conducting work in late fall and early spring would miss the peak recreational season, however, it is impossible to completely avoid all impacts to the aesthetic appeal of the area. The presence of the dredge, dredge pipe, and associated water and land based equipment would be evident and would temporarily degrade aesthetic quantities of the area. Some discoloration of the sand would occur following placement due to the fact that the sands to be placed on the beach are coming from an anaerobic environment. Bleaching of the sand should occur within one to two months. Rainfall and wave action would act to filter out the fine grained materials from the restored beaches and increase the compatibility of the nourishment sands with those presently on the beach.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves. No adverse impacts are expected to occur and any of these resources.

(f) Other Effects. No effect.

h. Determination of Cumulative Effects on the Aquatic Ecosystem. The proposed action is not expected to have significant cumulative adverse impacts. The action would have cumulative beneficial impacts due to erosion attenuation.

i. Determination of Secondary Effects of the Aquatic Ecosystem. The proposed action is not expected to have any significant secondary adverse effects on the aquatic ecosystem.

III. FINDING OF COMPLIANCE

a. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

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

c. After consideration of placement site dilution and dispersion, the placement fill material along the beach and nearshore zone would not cause or contribute to, violations of any applicable State water quality standards for Class III waters. A variance for an expanded mixing zone has been requested for the local project during the JCP application process. It is expected that information generated for the local plan will be used to request a variance for the proposed Federal project.

d. As required by the Coastal Zone Management Act, the proposed action is consistent with the Florida Coastal Zone Management Program to the maximum extent practicable.

e. The proposed excavation and beach restoration would not jeopardize the continued existence of any species listed as threatened or endangered or result in the likelihood of destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973, as amended.

f. The proposed excavation and beach restoration would not result in significant adverse effects on human health and welfare, including municipal and private water supplies; recreation and commercial fishing; life stages of organisms dependent upon the aquatic ecosystem; ecosystem diversity, productivity and stability; or recreational, aesthetic or economic values.

g. Appropriate and practicable steps to minimize potential adverse impacts on the aquatic ecosystem have been included in this evaluation.

h. On the basis of the guidelines, the proposed site for placement of fill materials is specified as complying with the requirements of these guidelines with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

DATE _____

Byron G. Jorns
Colonel, Corps of Engineers
District Commander

EA-APPENDIX B

**Previous Coordination Documents by Local Sponsor
SECTION I**

and

**Coordination Documents for the Selected Federal Plan
SECTION II**