

Final

Project Plan & Environmental Assessment

**Raccoon Island
Shoreline Protection/Marsh Creation Project
TE-48
Terrebonne Parish, Louisiana**

**United States Department of Agriculture
Natural Resources Conservation Service**

March 2005



3737 Government Street

Alexandria, LA 71302



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Project Plan
And
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for
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TE-48
Terrebonne Parish, Louisiana**

**UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE**

March 2005

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Raccoon Island Shore Protection/Marsh Creation Project
(TE-48)
Terrebonne Parish, Louisiana
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Abstract

This document describes the proposed plan to protect and restore a portion of the westernmost barrier island in the Isles Dernieres chain in Terrebonne Parish, Louisiana, referred to as Raccoon Island. The project will protect the Raccoon Island rookery and seabird colonies threatened by a retreating shoreline by reducing the rate of erosion along the western end of the island and creating more land and avian habitat along the northern shoreline. The recommended plan consists of installing eight segmented rock breakwaters immediately west of the existing Raccoon Island Breakwater Demonstration Project (TE-29); installing an eastern terminal groin structure extending to existing breakwater 0; and create approximately 60 acres of new habitat for bird species on the northeast portion of the island by backfilling an open water area with suitable dredged material.

This document has been prepared under authority of the Coastal Wetlands Planning Protection, and Restoration Act of 28 November 1990, House Document 646, 101st Congress. The document is intended to fulfill the requirements of the National Environmental Policy Act for the project to be funded under the authorization of Public Law 101-646.

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SUMMARY OF PLAN/EA

Project Name: Raccoon Island Shore Protection/Marsh Creation (TE-48)

Parish: Terrebonne Parish

State: Louisiana

Description of Recommended Plan:

The recommended plan will reduce the rate of shoreline erosion by lessening the direct impact of offshore wave energy south of the island and provide a buffer from wind generated waves in bayside areas by restoring dune and supratidal wetlands north of the island. Approximately 60 acres of new habitat for bird species will also be created.

Resource Information:

Size of Project Approximately 502 Acres

Land Ownership Public (100 Percent)

Wetlands Beach, Shrub, and Saline Marsh

Threatened and Endangered Species

Right whale	Kemp's ridley turtle	Piping plover
Sperm whale	Green turtle	E. brown pelican
Sei whale	Hawksbill turtle	
Finback whale	Leatherback turtle	
Humpback whale	Loggerhead turtle	

Cultural Resources Project will have no effect on significant cultural resources.

Problem Identification:

Loss of coastal shoreline and vegetated wetlands due to:

Shoreline erosion
Subsidence
Gulf Related Storm Events

Alternative Plans Considered:

No Action
Shoreline Protection
Shore Protection/Marsh Creation

Project Purpose:

Protect the Raccoon Island rookery and seabird colonies from an encroaching shoreline and create additional avian habitat for the nesting, staging, resting and feeding of local species.

Project Measures:

Eight (8) segmented rock breakwaters
An eastern terminal groin extending to existing breakwater 0
Create 60 acres of subaerial wetland area
Planting of woody and herbaceous plant species

Project Benefits:

Primary:

Prevent the loss of 62 acres of beach and saline marsh
Create 78 acres of dune, supratidal, and intertidal habitat

Secondary:

Encourage littoral sediment deposition and accretion landward of the breakwaters to further reduce wave energy impacts
Improve support of wildlife populations by enlarging habitat areas
Substantially improve the recovery potential of lost resources due to severe tropical storm events

Potential Adverse Impacts:

Short-term impacts may include temporary, localized increase in turbidity and suspended solids during the construction period, localized destruction of some non-motile benthic organisms and their habitat in the vicinity of the proposed measures, and potential wave climate changes associated with offshore borrow area excavation.

No long-term adverse impacts to adjacent islands, wetlands, water quality, threatened or endangered species, species managed by Gulf of Mexico Fishery Management Council or their essential habitat, other fish and wildlife resources, recreational or socio-economic resources, or cultural resources are expected.

The construction of offshore, segmented breakwaters is anticipated to disrupt longshore and cross-shore transport of sediments within their footprint. There is speculation that short and/or long-term adverse impacts may result to downdrift areas immediately west of the breakwaters.

Introduction

The primary objective of the Raccoon Island Shore Protection/Marsh Creation Project (TE-48) is to prolong the longevity of rookery habitat and seabird colonies on the island by reducing the rate of gulf and bayside shoreline retreat. Raccoon Island is one of the only barrier islands along the Isle Dernieres chain with a fairly extensive wooded habitat still remaining and as such is an important nesting area for many species including the brown pelican (*Pelecanus occidentalis*). The project objective will be accomplished by using offshore segmented breakwaters to reduce wave energy and impact on the gulf shoreline and by creating a wetland buffer area with dredged material on the northern shoreline. A secondary objective is to utilize the newly created buffer area as additional avian habitat by planting woody and herbaceous plant species on dune and supratidal areas. The proposed project consists of constructing eight (8) segmented rock breakwaters, addition of a terminal groin extending from the eastern end of the island to breakwater 0, and creation of approximately 60 acres of dune/supratidal/intertidal habitat and plant accordingly.

Federal funds to be used for planning and implementing projects, which create, protect, restore, and enhance wetlands in coastal Louisiana, are provided by the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) of 28 November, 1990, House Document 646 101st Congress. The Act calls for formation of the Louisiana Coastal Wetlands Conservation and Restoration Task Force (Task Force) to consist of the Secretary of the Army, the Administrator of the Environmental Protection Agency (EPA), the Governor of Louisiana, the Secretary of Interior, the Secretary of Agriculture, and the Secretary of Commerce. The Louisiana Department of Natural Resources (LDNR) typically serves as the local cost share partner for projects.

The Raccoon Island Shore Protection/Marsh Creation Project (TE-48) was approved for planning, engineering, design, and pre-construction monitoring on the Eleventh Priority Project List submitted to Congress in April 2002. Once planning, engineering, and design are substantially complete, the project will be submitted to the Task Force for the funding of construction, maintenance, rehabilitation, and post-construction monitoring.

Under CWPPRA specifications, the project must be cost-shared between the federal sponsoring agency and the State of Louisiana. Pursuant to approval of the Louisiana Coastal Wetlands Conservation Plan, the federal government provides 85 percent of the project cost and the State of Louisiana contributes the remaining 15 percent. The United States Department of Agriculture (USDA), through the Natural Resources Conservation Service (NRCS), acts as the federal sponsor for this project and the State of Louisiana has indicated its willingness to cost-share on the proposed action.

This Project Plan/Environmental Assessment (Plan/EA) has been prepared to fulfill the requirements of the National Environmental Policy Act of 1969 (NEPA). This Plan/EA describes problems affecting the area, significant resources, alternatives, the recommended alternative and its impacts, and public participation.

Project Setting

Location

The Raccoon Island Shore Protection/Marsh Creation Project area lies within the Terrebonne Hydrologic Basin in Terrebonne Parish, Louisiana. The project area is located central to a point approximately twenty-one miles southwest of the community of Cocodrie (Figure 1). The island is the westernmost barrier island in the Isles Dernieres chain and falls within Region 3 of the Coast 2050 Management Plan. The project encompasses approximately 502 acres of beach, shrub, saline marsh, and open water.

Climate

The climate in southern Louisiana is influenced by its subtropical latitude and its proximity to the Gulf of Mexico. The project area is characterized by long, hot, humid summers with areas adjacent to the coast frequently being cooled by sea breezes. The average daily maximum temperature is 78.4°F and the average daily minimum temperature is 58.8°F. The winters are mild with only a few cold days. The average frost-free period of 264 days extends from February 22 to November 18.

Average rainfall is 62 inches. Even though the rainfall is fairly evenly distributed throughout the year, it is heaviest from June through September.

Geologic Setting

Raccoon Island is a remnant of a transgressive barrier island arc of the Lafourche subdelta complex of the Mississippi River Delta Plain. The substrate is composed of Holocene deltaic sediments that overlie Pleistocene deposits at depths of approximately 400 feet. Compaction of these Holocene sediments, combined with structural movements related to geosynclinal settling and faulting, results in high rates of subsidence. Only the introduction and retention of sediments offset subsidence.

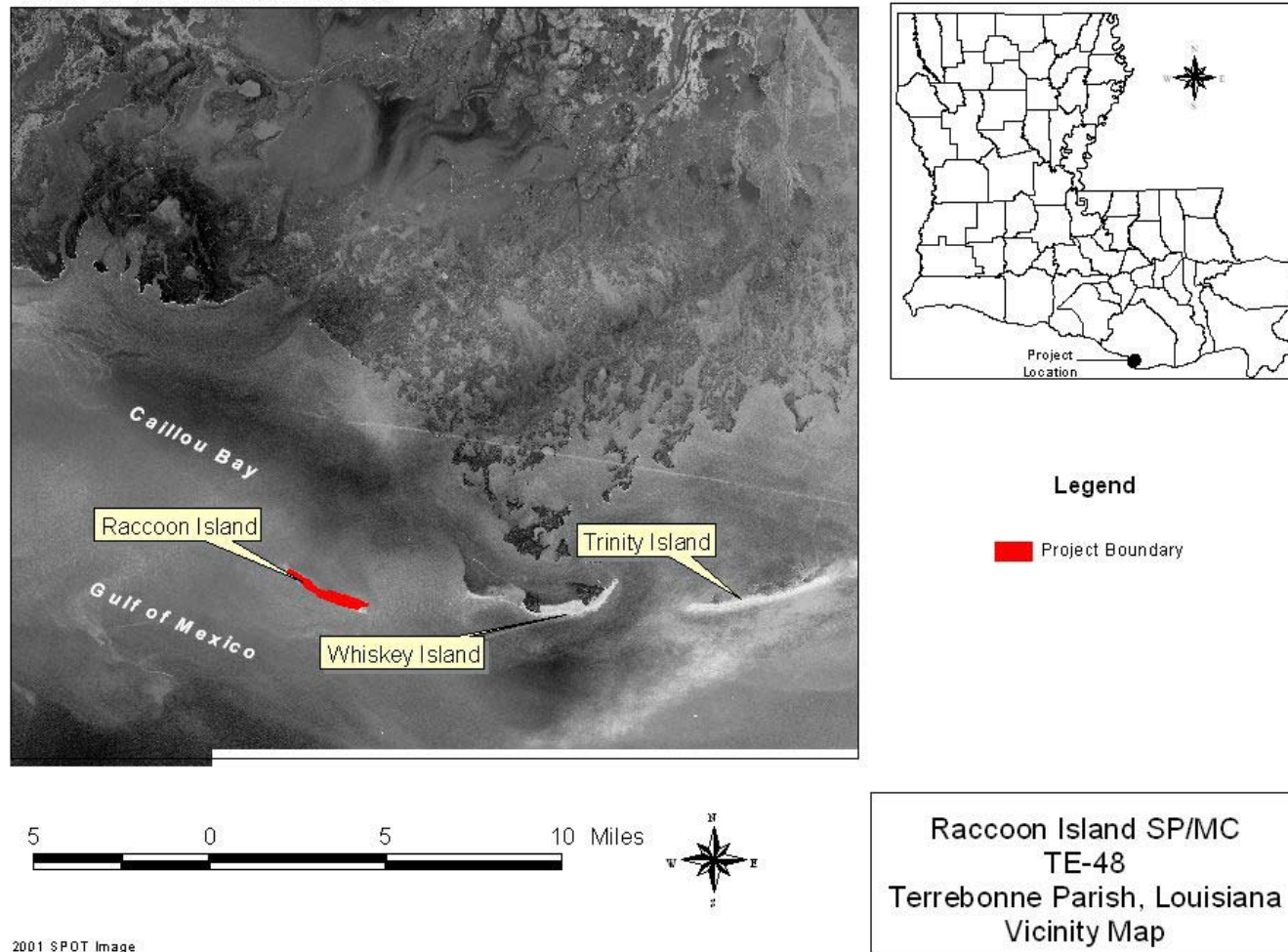
Raccoon Island is located on the western end of the Isles Dernieres barrier island arc. The Isles Dernieres barrier island chain has been documented to be one of the most rapidly deteriorating barrier shorelines in the United States (McBride and Byrnes 1997). This has led to the rapid landward migration (often referred to as barrier island rollover) and disintegration of the islands. The Isles Dernieres formed 500 years ago as a result of the abandonment of the Caillou headland (part of the Lafourche delta complex) by the Mississippi River (Frazier 1967). The barrier island arc is segmented into four islands: East Island, Trinity Island, Whiskey Island, and Raccoon Island, which is located at the western extent.

It was the inland and westward transport and deposition of sand loamy sediments of the abandoned Lafourche subdelta that formed the island. The movement of sediment inland and westward continues today with coarser sandy material deposits forming the gulfside beaches and the overwashing clayey and mucky sediments depositing on the lee side of the island that form a platform for marshes and scrub-shrub habitat. Detailed analysis of sediment transport dynamics as it relates to the island's formation, development, and management are provided in Stone et al. 2003 and Thomson et al. 2004.

Figure 1. Project Area Vicinity Map



Figure 1. Project Area Vicinity Map



Historically, most of Louisiana's barrier island shorelines have been in a chronic stage of deterioration resulting from the complex interaction of natural and human influences. As the fragmented islands have become smaller and less geologically stable, the effects of storms have increasingly become more devastating and threaten complete loss of smaller islands like Raccoon Island. For example, Hurricane Andrew in 1992 resulted in the loss of nearly half of the island area. In fact, the devastation of Hurricane Andrew on Raccoon Island is what necessitated the beginning of human intervention in order to sustain what remains of the island today.

Distribution and Soil Types

The soils found in the project area have been recently mapped as Felicity and Scatlake soils (Figure 2) (Appendix A). Felicity soil formed in the sandy beach rim/dune complex along the Gulf of Mexico shoreline. The Scatlake soil formed on the level lee side of the island in remnant intratidal deltaic marsh sediment consisting of clay and muck, with washover of sand and loam. Both soils formed in a saline environment.

Felicity loamy fine sand, 1 to 3 percent slopes, frequently flooded (FCA)

This level to gently sloping, somewhat poorly drained, very rapidly permeable soil is located on the convex beaches along the Gulf shorefront. The soil is frequently flooded by high tides and storm surges. Washover causes the soil to be subject to scouring and deposition by sediment. Typically the surface layer is grayish brown, loamy fine sand about nine inches thick. The underlying material to a depth of 60 inches is a dark grayish brown, very dark gray or olive gray, loamy sand.

Scatlake muck, tidal (SCA)

This level, very poorly drained, very fluid mineral soil is in saline coastal marshes. The surface layer is dark gray muck. The underlying layer, to a depth of 75 inches, ranges from dark gray muck to a gray, very fluid clay. The soil is inundated daily by saline tidal water. Typically the surface layer is a dark gray, very fluid muck about eight (8) inches thick. Some areas are overlain by sandy and loamy sediment due to tidal washover. Tidal channels dissect many areas.

Emergent and Submerged Aquatic Vegetation

Vegetation plays several critical roles in the stabilization and function of barrier islands. Plants colonize and protect newly deposited material from erosion and provide the physical structure necessary to trap and retain wind and water borne sediment that is essential for dune formation and vertical maintenance. Accumulating detrital material from decomposing plants contributes to soil nutrients and structure and forms the basic trophic level of the food chain. Vegetation also provides a diversity of habitat functions. The Raccoon Island plant communities furnish vital resting habitat to neotropical migratory birds during their transgulf migration and nesting areas for colonial waterbirds. Plant structures have also been found to support a vigorous epiphytic population of algae as well as a diverse population of diatoms (Stowe 1982).

As previously discussed, Raccoon Island was once part of the continuous Isle Dernieres barrier island arc. Positioned in the interface between estuarine and marine processes, Raccoon Island is subject to the extremely dynamic environmental conditions that generate considerable spatial and temporal variation in barrier island structure and habitat. An example of the highly dynamic conditions of the island can be seen in Figure 3, which

Figure 2. Project Area Soils Map

Figure 2. Project Area Soils Map.

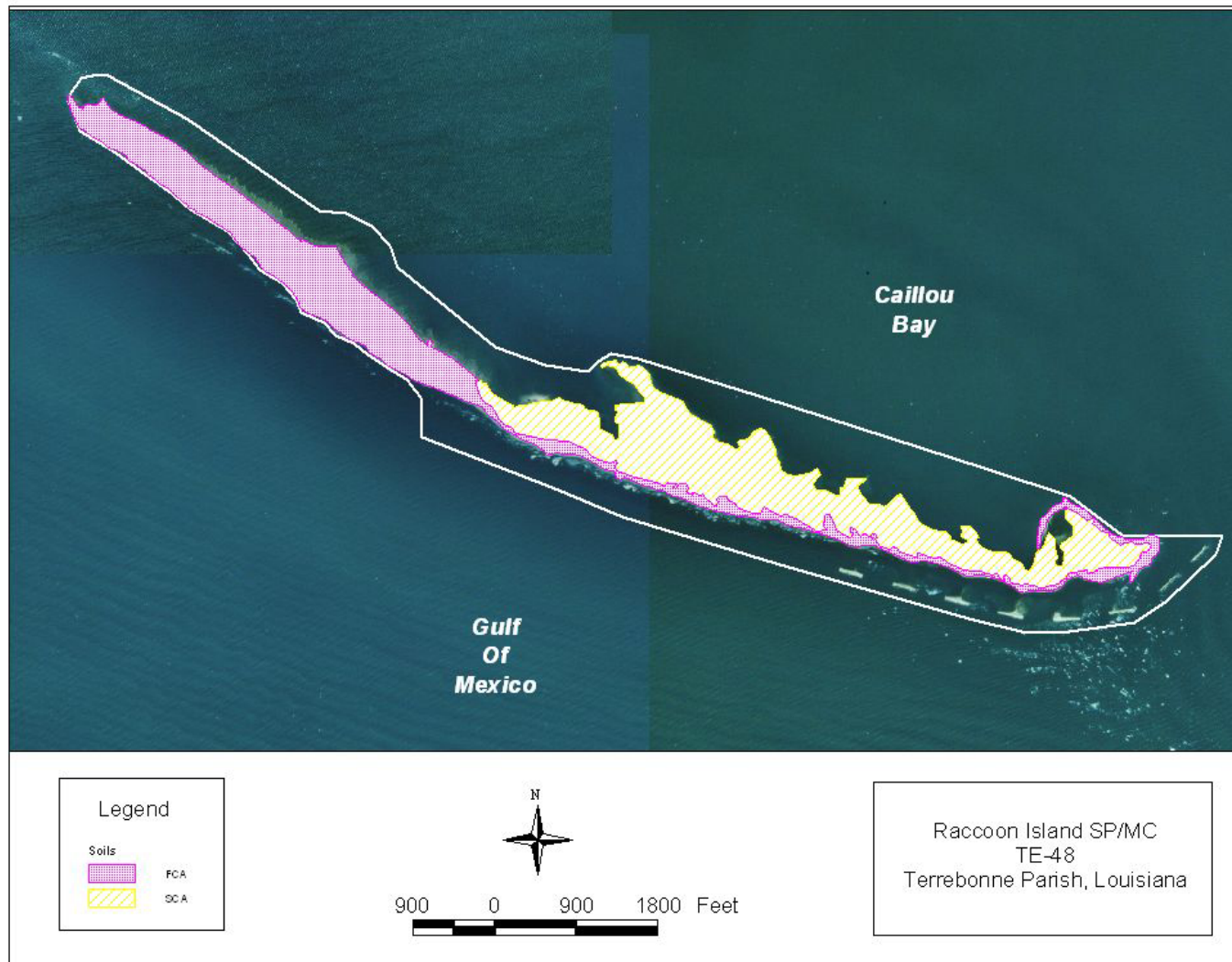
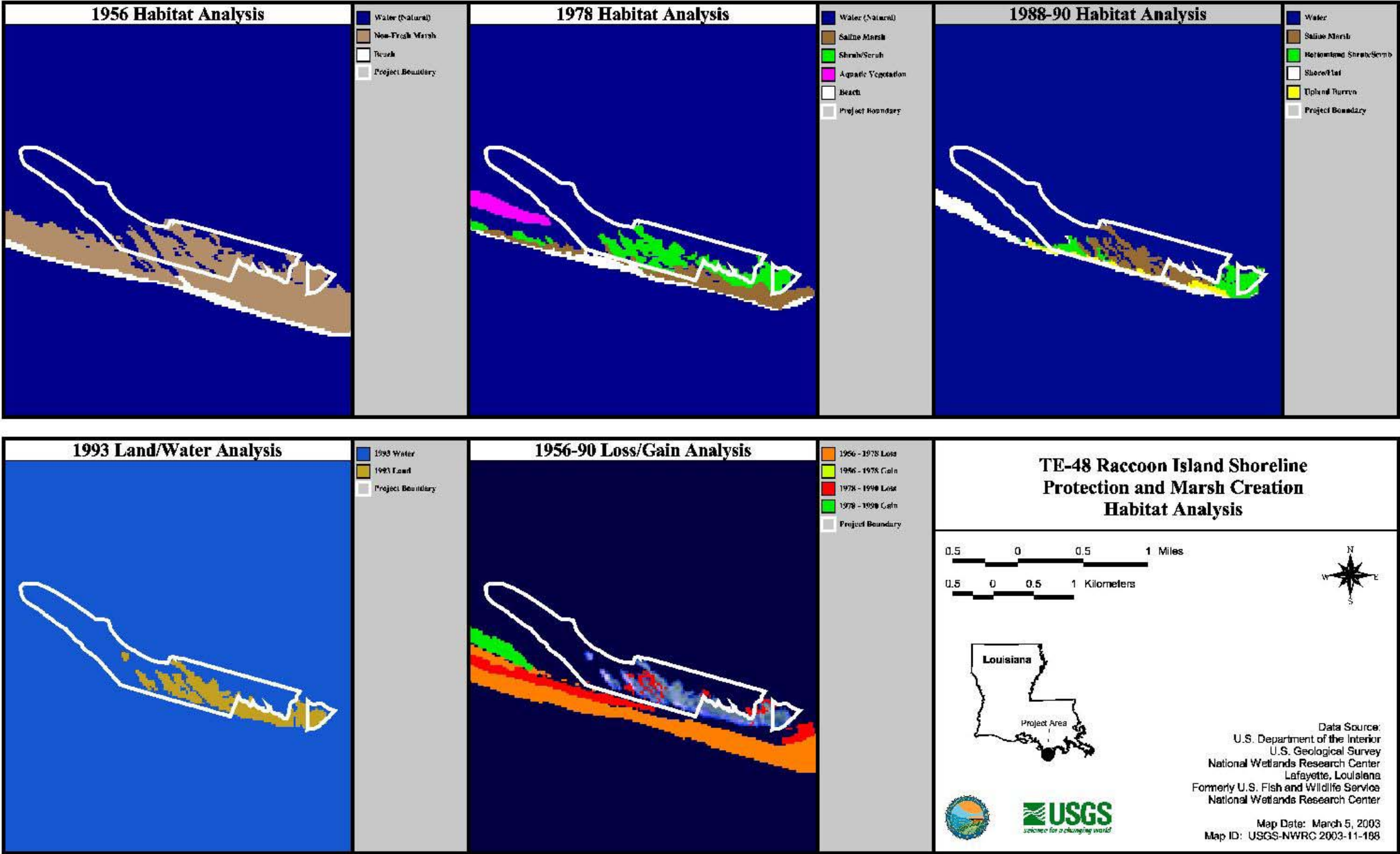


Figure 3. Project Area Habitat/Land Loss Maps.

Figure 3. Project Area Habitat/Land Loss Maps.



includes USGS habitat and land/water analyses for various time periods. Changes in the species composition and distribution of plant communities are a reflection of the processes impacting Raccoon Island. The occurrence and arrangement of barrier island vegetation communities are associated with substrate elevation and the degree of exposure to tidal inundation and salt spray. Disturbances that change these conditions, and therefore affect the distribution and persistence of plant species, typically include overwash, erosion, or accretion associated with storm events, sediment deprivation, subsidence, and sea level rise.

Early accounts of Isle Dernieres depict it as a single wooded island fronted by a broad beach (Silas 1890) and a “myrtle-shadowed village at the island’s western tip” was described by Deutschman (1949). The presence of wooded areas and wax myrtle (*Morella cerifera*) certainly indicate that the area now called Raccoon Island was part of a relatively higher and wider, more stable barrier island system than at present. Wax myrtle typically grows in fresh conditions, but tolerates very low salinities and is not uncommon in barrier island and headland habitats, where sufficient protection is provided from salt spray and tidal events. Raccoon Island has experienced a tremendous amount of narrowing, loss of elevation, and fragmentation due to erosion and overwash events, as have all of the Louisiana barrier islands in the last century (McBride et al. 1992). Areas remaining on barrier islands with conditions suitable for wax myrtle are minimal. Presently, wax myrtle thicket (synonym of coastal dune shrub thicket), as classified by the Louisiana Natural Heritage Program (LNHP), is listed as a rare community because of its limited extent throughout Louisiana due to the relatively poorly-developed coastal dunes remaining in the state (Craig et al. 1987).

More recently, during a study initiated in 1994 (Visser and Sasser 1998), six distinct vegetation communities were identified on Raccoon Island. These six communities generally occurring from the beach northward were dune, overwash, mangrove, salt flat, high marsh, and marsh. Of these, the dune community occurs at the highest elevation, and in this study was found to be sparsely vegetated with marshhay cordgrass (*Spartina patens*) as the dominate species, and yellow nut flat sedge (*Cyperus esculentus*), marshelder (*Iva frutescens*) or sea ox-eye (*Borrichia frutescens*) were the most frequent other species. Marshhay cordgrass is known to primarily occur in brackish to saline marshes, low dunes and along wet tidal shores. The overwash habitat was very sparsely vegetated by sea purslane (*Sesuvium portulacastrum*), seashore dropseed (*Sporobolus virginicus*), or saltwort (*Batis maritima*). The mangrove habitat was dominated by black mangrove (*Avicennia germinans*), and often had saltwort or smooth cordgrass (*Spartina alterniflora*) as co-dominants. The salt flat habitat transitioned from old overwash that had been colonized by a mixed community of saltwort, sea ox-eye, and woody glasswort (*Salicornia virginica*). Salt flat habitat graded into high marsh habitat dominated by smooth cordgrass with saltwort as a frequent co-dominant species. The marsh areas were dominated by smooth cordgrass with no co-dominants. Wax myrtle was not included in the list of species found in this study.

The latest NRCS field investigations in 2004 revealed that black mangrove was the dominant species found in all evaluated sites that contained emergent vegetation. At more than half of the sites, black mangrove composed 80% or more of the plant community cover. Smooth cordgrass, marshhay cordgrass, and marshelder also occurred at all sites, but typically none composed more than 10% of the community cover. Other species that were listed composed less than 5% to trace amounts of the community and were sea purslane, salt grass (*Distichlis spicata*), saltwort, glasswort, sea ox-eye, seaside goldenrod (*Solidago sempervirens*), seaside heliotrope (*Heliotropium currasavicum*), and matrimony vine (*Lycium carolinianum*).

Smooth cordgrass typically grows in the brackish to saline intertidal pools, shallow lagoons, and saturated marsh areas flooded by high tides (Chabreck and Condrey 1979; Godfrey and Wooten 1979). The current overwhelming dominance of the plant community by species

that occur at the lower elevations of emergent coastal habitats is indicative of Raccoon Island's reduction in height and increasing encroachment of gulf influences.

No submerged aquatic vegetation was noted to occur during the 2004 NRCS investigation. Although the LNHP listed the bayside of the Isle Dernieres barrier islands as potential sites for marine aquatic bed (Craig et al. 1987), no record of recent occurrence is known.

Water Quality

Section 305(b) of the Louisiana Department of Environmental Quality's 2002 Water Quality Inventory report lists Caillou Bay (water body segment number – LA 120801-00) as an estuary that fully supports primary contact recreation, secondary contact recreation, and oyster production. The estuary is listed as not fully supporting fish and wildlife propagation. The suspected cause of impairment is turbidity with the natural conditions being listed as the suspected source. The Environmental Protection Agency (EPA) Consolidated Assessment and Listing Methodology (CALM) has placed this system into the 4c category. This rating is described as a waterbody which is impaired for one or more uses but a pollutant does not cause the impairment.

There are no freshwater surface waters on Raccoon Island. Caillou Bay surrounds the island on the backside and the Gulf of Mexico interfaces with the beach on the front side and crosses into Caillou Bay, where the island is breached. Due to the proximity of the Gulf of Mexico, salinities in the area are high. Coastal waters are rather turbid due to the suspended sediments in the longshore currents from Mississippi River discharge and from coastal erosion.

Air Quality

As required by LAC 33:111.1405B of the Louisiana Department of Environmental Quality air regulations, an applicability determination was made for current conditions and for the separate items of the proposed project. The applicability determination was based upon direct emissions. Indirect emissions were not considered, since no other Federal actions, such as licensing or subsequent actions relating to construction, are anticipated for this project. It is assumed that if any indirect emissions would occur they would be negligible.

Fish and Wildlife Resources

Wildlife

Barrier islands are recognized as having a plethora of fish and wildlife species associated with them. The habitats found on Raccoon Island, in addition to its relative isolation to human disturbance and lack of predators, provide for the greatest species diversity of nesting colonial waterbirds found on any barrier island in the state (Vermillion 2003, personal communication). In addition to nesting, these avian species utilize the island for feeding and resting. An example is the endangered brown pelican of which the island currently supports the largest nesting colony in the state (Hess 2003, personal communication). Also included, but not limited to, in this species diversity are colonial seabirds such as black skimmers (*Rynchops niger*), least terns (*Sterna antillarum*), sandwich terns (*Sterna sandvicensis*), wading birds such as great egrets (*Ardea alba*), reddish egrets (*Egretta rufescens*), glossy ibis (*Plegadis falcinellus*), and roseate spoonbills (*Ajaia ajaja*). Other non-nesting species, such as shorebirds, including the threatened piping plover (*Charadrius melodus*) and neotropical migrants, utilize the island during migration as a resting and feeding area.

In addition to the endangered brown pelican and threatened piping plover, which are protected under the Endangered Species Act of 1973, colonial nesting waterbirds are protected under the Migratory Bird Treaty Act. Therefore, construction activities will be coordinated with LDWF, USFWS, LDNR and NRCS, and contractors will be required to minimize habitat disturbance.

Emergent marshes, remnant dunes, and marsh ponds in the project area provide habitat for other wildlife species including reptiles, amphibians, and mammals. These species numbers are very limited due to flooding and distance of the island from the mainland. The Atlantic bottlenose dolphin (*Tursiops truncatus*) is the only marine mammal commonly found in the gulf and bay waters surrounding the island.

Fisheries

The project area is bordered by Caillou Bay to the north and the Gulf of Mexico to the south. Raccoon Island is an estuarine system composed of several small inlets, sloughs, and small ponds intertwined throughout the saline marsh, all of which are tidal. Shallow tidal sand flats, sandbars, and shallow bayside areas make up the periphery of the island edge. All of these components make for abundant saltwater fisheries in the project area and surrounding water bodies. Important recreational species include red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), sand seatrout (*Cynoscion arenarius*), and southern flounder (*Paralichthys lethostigma*). Commercial species include white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), blue crab (*Callinectes sapidus*), and gulf menhaden (*Brevoortia patronus*). Other common species include Atlantic croaker (*Micropogonias undulatus*), spot (*Leiostomus xanthurus*), bay anchovy (*Anchoa mitchilli*), striped mullet (*Mugil cephalus*), and black drum (*Pogonius cromis*). These species vary in abundance from season to season due to their migratory life cycle. Most species spawn offshore in the open Gulf of Mexico and enter the island and bay area to use the shallow bay bottoms and island marsh habitats as a nursery. Other utilization of the project area by these and other fisheries species include foraging and predation refugia.

Threatened and Endangered Species

Based on consultation with the U.S. Fish and Wildlife Service (USFWS) in 2003, there is one threatened (T) and one endangered (E) species that occur within the project boundaries. Other threatened and endangered species do occur within the adjacent gulf waters but are not likely to be found within the actual boundaries of the project. As noted previously, endangered brown pelicans nest in large numbers on Raccoon Island (4,500 nests in 2002), (Hess, 2003, personal communication). In addition to Raccoon Island, endangered brown pelicans are currently nesting on Queen Bess Island, Wine Island, and scattered locations within the Chandeleur chain. Nests are built in the late winter, spring, and summer, primarily in mangrove trees and other shrubby vegetation, but may also occur on the ground. Brown pelicans also utilize the shallow estuarine waters and open gulf for feeding, and the beach, sand flats and rock breakwaters as resting or loafing sites.

Threatened piping plovers migrate during the fall and spring through coastal Louisiana. These birds are primarily associated with the sand flats and beaches, and occur within the project area primarily during migration periods, but may be present in Louisiana for 8 to 10 months of the year. They arrive from their breeding grounds as early as late July and may remain until late March or April. Designated critical habitat of the piping plover are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes. These components include sparsely vegetated intertidal beaches and flats that occur between annual low tide and annual high tide

and associated dunes and flats above annual high tide. Roosting plovers prefer un-vegetated or sparsely vegetated sand, mud, or algal flats above high tide. Major threats to this species in Louisiana are degradation and loss of habitat.

The endangered Kemp's ridley (*Lepidochelys kempii*), hawksbill (*Eretmochelys imbricate*) and leatherback (*Dermochelys coriacea*) sea turtles as well as the threatened loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) sea turtles occur in the Gulf of Mexico. Of these five sea turtle species, the loggerhead and ridley sea turtles are relatively common in the nearshore waters of the Gulf of Mexico, where they forage, and may occur within the actual project area. Juvenile and sub-adult Kemp's ridley turtles occupy shallow coastal waters, where crabs are abundant and substrates are sand or mud. Small turtles are generally found nearshore from May through October. Adults and juveniles move offshore to deeper, warmer water during the winter.

There are five endangered species of whales that occur in the Gulf of Mexico. They include the finback (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), right (*Eubalaena glacialis*), sei (*Balaenoptera borealis*) and sperm (*Physeter catodon*) whales. Due to the extreme shallow waters within the project area, none of these species would likely occur.

Essential Fish Habitat

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) (P.L. 104-297), the Gulf of Mexico Fishery Management Council (Council) had identified portions of the project area as Essential Fish Habitat (EFH) for those species managed under its fishery management plans (Gulf of Mexico Fishery Management Council 1998). Project area wetlands provide habitat for a number of Council-managed species such as subadult white shrimp, post-larval, juvenile, and subadult brown shrimp, and red drum juveniles and subadults. Additionally, Council-managed species such as mackerels, snappers, groupers and highly migratory species such as billfish and sharks feed upon species such as seatrout, gulf menhaden, striped mullet, and blue crab that utilize project area wetlands. In the project area, the following have been identified by species, life stage, and EFH for that area.

Species	Life Stage	EFH
Brown shrimp	Postlarvae/juvenile Subadults	Marsh edge, SAV, tidal creeks, inner marsh Mud bottoms, marsh edge
White shrimp	Postlarvae/juvenile Subadults	Marsh edge, SAV, marsh ponds, inner marsh
Red drum	Postlarvae/juvenile Subadults	SAV, estuarine mud bottoms, marsh/water interface (marsh edge) Mud bottoms Estuarine mud bottoms
Spanish mackerel	Juveniles	Beach, estuaries
Bluefish	Postlarvae/juveniles Adults	Beaches, estuaries, inlets, Estuaries

Migratory Birds

In accordance with Executive Order 13186 of January 10, 2001, which requires that Federal agencies include protection of migratory bird habitat in all planning efforts, this project will not only protect existing habitat, but will also create additional acreage and vegetated habitat providing roosting and refueling areas for both spring and fall migrants. Listed migratory birds that inhabit the island include those of two major groups. Group 1 is characterized by ground nesting (i.e. seabird colonies) and Group 2 is characterized as rookery nesting species that build raised nests among the woody (mangroves) and pseudo-woody vegetation (e.g. sumpweed). Group 1 birds include sandwich tern, royal tern, black skimmer, and laughing gull. Group 2 includes tricolor heron, great egret, snowy egret, reddish egret, little blue heron, black-crowned night heron, yellow-crowned night heron, roseate spoonbill, white ibis, and brown pelican.

Other migratory birds that may use the island are neotropical migrants that are enroute during spring and fall migration periods, migrating shorebirds, including the threatened piping plover, and some waterfowl, such as the pied-billed grebe and common loon (Vermillion 2003, personal communication).

Cultural Resources

An investigation of cultural resources for CWPPRA projects is done in a three-phase process. The first phase is an investigation by NRCS of the National Registry of Historic Places and site files at the State Historic Preservation Office, Division of Archaeology. The second phase is a review by the Louisiana Division of Archaeology to determine potential impacts to any resources; followed, if necessary, by a field investigation conducted by professional archaeologists. In the event any cultural resources are found to be of significant value, then the plan will be modified to minimize or eliminate potential impacts.

An NRCS review of the State site survey files and a letter of concurrence dated July 28, 2004, from the Louisiana Department of Culture, Recreation, and Tourism, Division of Archaeology in Baton Rouge, Louisiana revealed that there are no known cultural sites or historic properties located within the Raccoon Island Project area. Therefore, there are no known sites eligible for the National Historic Register at this time.

Social and Economic Resources

The 2000 U.S. Census Bureau (Source: www.census.gov) estimated population for Terrebonne Parish is 104,500, which represents a 7.7 percent increase from 1990. Louisiana's estimated 2000 population of 4,469,000 represents a lower increase of only 5.9 percent over the 1990 census.

Overall, social and economic conditions for Terrebonne Parish residents are quite good compared to the rest of Louisiana. The per capita income for the parish is \$16,500 compared to the state average of \$16,900. Terrebonne's median household income of \$35,200 is greater than the state's median of \$32,600. Terrebonne Parish's family poverty rate of 15.8 percent is the same as the state average. The unemployment rate for Terrebonne is 3.3 percent, a full percent lower than the state unemployment rate of 4.3 percent. Terrebonne's median residential property value of \$80,500 is slightly higher than the state median value of \$80,000.

Agriculture and fishing in particular are important industries in Terrebonne Parish. Commercial fishery landings in Terrebonne Parish were reported at 3.6 million pounds worth

\$8,860,987 in 2002 (LSU Ag Center 2003). Shrimp and crab landings for Terrebonne Parish in 2002 were estimated at \$32,471,115 and 37,071,000 pounds, respectively. Freshwater landings in 2002 amounted to 1,050 pounds of catfish and 574,373 pounds of crawfish. Terrebonne Parish's marsh and wetlands are the backbone of this industry and culture. Estimates show Terrebonne Parish to be losing vital wetlands at a rate of 5,500 acres per year.

Problems and Opportunities

The Isle Dernieres barrier island chain is experiencing some of the highest rates of erosion of any coastal region in the world. This has led to the rapid landward migration (barrier island rollover) and disintegration of the Isle Dernieres, as well as a decrease in the ability of the island chain to protect the adjacent mainland marshes and wetlands from the effects of storm surge, salt water intrusion, an increased tidal prism, and energetic storm waves (McBride and Byrnes 1997). The Isles Dernieres formed approximately 500 years ago as a result of the abandonment of the Caillou headland (part of the Lafourche delta complex) by the Mississippi River (Frazier 1967). The barrier island arc became segmented into four islands: East Island, Trinity Island, Whiskey Island, and Raccoon Island.

Greer et al (1985) in a study of the Louisiana saline marsh zone from the Atchafalaya River to Mississippi state boundary looked at over 100 sites and determined that colonized islands had the following characteristics for providing good bird habitat: 1) smaller island size, 2) farther from nearest mainland, 3) farther from nearest island, 4) higher shrub percentage, and 5) lower herbaceous vegetation percentages.

In August 1992, Hurricane Andrew caused extensive damage to the island. An effort to repair this damage involved placement of dredge material (1.2 million cu. yds.) on the island (October 1993 – February 1994) and plantings in March 1994 (4,500 plants) and again in October 1994 (7,000 mangrove plantings). During the past century this reach of coast has experienced more than 32 ft. per year (9.8 m/yr) of erosion (McBride et al. 1992). As a result, interior marshes have been gradually decreasing in size. Thomson et al. (2004) estimated that an average shoreline recession rate of 54 ft/yr would occur in the area over a 20 year time span, where the breakwater field is proposed under a no action scenario.

In 1995, the State of Louisiana proposed the implementation of a near-term strategy for large-scale restoration of its barrier islands (van Heerden and DeRouen 1997). As part of the comprehensive barrier island restoration plan, the Raccoon Island Breakwaters Demonstration Project (TE-29) was initiated to demonstrate the effectiveness of segmented breakwaters in mitigating shoreline erosion along the Louisiana barrier islands, and to evaluate the potential role of breakwaters in future barrier island protection and restoration efforts. Data collected through July 1998 indicate that the segmented breakwaters on Raccoon Island have attenuated wave energy and significantly reduced the rate of shoreline retreat (Armbruster 1999). A substantial amount of sand accumulation, ranging from 40 to over 70 m³/m, was measured in the immediate vicinity of the breakwater segments, as well as in the gaps between the breakwaters during the first 12 months after construction (Stone et al. 1998). Recent photo analysis by USGS indicates that the downstream impact from breakwater construction is not as severe as other studies have indicated (Handley et al. 2005).

In September 2002, Tropical Storm Isadore, and one (1) week later in October 2002, Hurricane Lily caused moderate damage to the island. A considerable amount of accreted sand material both seaward and landward of the breakwaters was lost. In comparison to other barrier islands along the Isle Dernieres and Timbalier chain, aerial photography

indicates Raccoon Island sustained the least amount of damage mainly due to the protection afforded by the breakwaters (Linscombe 2002). In addition, the breakwaters provide the potential for a short term recovery process whereas the recovery of resources for other barrier islands are either human-dependent, long term, or perpetually lost.

Scope of the Project Plan/EA

Scoping of Concerns

The public, government agencies, landowners, and land users have expressed concerns about the perpetual loss of emergent marsh and barrier islands in the Terrebonne Basin. A Region 3 regional ecosystem strategy in the Coast 2050 Management Plan addresses the concern of barrier island and gulf shoreline losses. The strategy states “Restore and maintain the Isles Dernieres, Marsh Island, Cheniere Au Tigre, and Timbalier barrier island chains”.

The submission of this proposed project, selection for project funding, and development of the Plan/EA resulted from the recognition of, and efforts to address the concerns specific to the “Raccoon Island Shore Protection/Marsh Creation Project” area. The concerns determined to be highly significant to decision making are loss of shoreline, reduction in rookery and seabird colony populations, loss of fish and wildlife habitat, and loss of barrier island vegetative communities.

Other concerns determined to be highly significant to decision making are the condition of open water areas, water quality, air quality, preservation of cultural resources, essential fish habitat and impacts to longshore/cross-shore transport processes. Each of these concerns is addressed in the analysis of all alternatives.

Formulation, Description, and Comparison of Alternatives

Formulation of Alternatives

The Raccoon Island Shore Protection/Marsh Creation Project was developed by NRCS in cooperation with LDWF, landowners, the general public and other state and federal agencies. Several important actions take place prior to and during actual development of the Plan/EA. One of the most important actions is an assessment of the project area. An interdisciplinary team comprised of engineers, biologists, soil scientists, vegetative specialists, district and resource conservationists conduct field investigations to inventory existing conditions and resources. Current and historic aerial photographs are researched to determine land loss rates, shoreline regression, possible changes in land use, hydrologic parameters, and a gamut of other important details to be used in the planning process. Project alternatives are developed and landowners, land managers, and resource agencies are consulted to determine which alternatives best suit the project’s goals and objectives. Each alternative is also evaluated for completeness, effectiveness, efficiency, and acceptability to landowners and the public.

Synthesis of the above information by NRCS resulted in the formulation of three alternatives: (1) no action, (2) shoreline protection, and (3) shoreline protection (Phase A)/marsh creation (Phase B). The shoreline protection/marsh creation alternative conforms to multiple regional ecosystem strategies listed for Region 3 in the Coast 2050 report. Those strategies include “dedicated delivery of sediment for marsh building” and “restore and maintain the Isles

Dernieres barrier island chain” (LA Coastal Wetlands Conservation and Restoration Task Force and Wetlands Conservation and Restoration Authority 1999). In the initial planning phase of this project, several alternatives in regard to shoreline protection, both gulfward and bayward of the island, were evaluated. Those considered were a continuous rock dike, geotubes, salvage material (e.g. barges, military tanks, ships, autos), dune reconstruction with material placement, and segmented rock breakwaters. Various factors considered in determining the alternatives best suited to meet the goals and objectives of the project included, but were not limited to, durability, longevity, constructability, impacts to resources, material availability, economic feasibility, and the proven success of the adjoining demonstration project.

The selected alternatives, comparison of each, and environmental effects are listed below. The shoreline protection (Phase A) component alone was listed as a separate alternative because it has already received Phase 2 approval by the CWPPRA Task Force (October 2004). NRCS anticipates requesting Phase 2 approval for marsh creation (Phase B) in 2006.

Description of Alternatives

Alternative 1: No Action

This alternative consists of no treatment for the project area. No structural or non-structural measures would be planned, installed, or maintained.

Alternative 2: Shoreline Protection

Proposed structural measures in Alternative 2 include the construction of eight additional segmented breakwaters along the gulf side of the island just west of the existing Raccoon Island Breakwaters Demonstration Project (TE-29). The template section and physical parameters of the proposed breakwaters will closely replicate that of the Demonstration Project. Another component of this phase of the project will involve installing a terminal groin extending from the eastern end of the island to breakwater 0 of the TE-29 Demonstration Project with rock riprap. The terminal groin structure is expected to eliminate the tidal currents that flow between the shoreline and the breakwaters, which are causing continued high rates of erosion on the eastern tip of the island. A Sediment Budget Report was generated by Coastal Planning & Engineering, Inc., under contract with LDNR, to better ascertain the potential impact and shoreline response to NRCS’s proposed breakwater field (Thomson et al. 2004). Results of the report and consideration of comments received from state and federal agencies and the academic community were influential in finalizing the shoreline protection features.

Alternative 3: Shoreline Protection/Marsh Creation

The Raccoon Island Shore Protection/Marsh Creation alternative will be constructed in two (2) separate phases. Phase A will constitute gulf side shoreline protection components as described in Alternative 2 and Phase B will include all measures in regards to the bayside marsh creation portion of the project.

The Phase B, or marsh creation, portion of the project involves creating approximately 60 acres of additional barrier island habitat on the bayside area as a northward extension of the current island. Structural features include building a retention dike between two peninsulas to enclose a large open water cove area, then backfilling the area with hydraulically dredged material. Non-structural features involve planting the newly created dune and supratidal areas with woody and herbaceous plant species to compliment existing island habitat. Such

created wetlands should significantly enhance crucial habitat for brown pelicans and various species of colonial waterbirds along with extending the projected existence of the island itself.

Environmental Effects and Comparison of Alternatives

Adoption of USCOE Environmental Assessment

During the implementation process for the TE-29 Raccoon Island Demonstration Project, NRCS opted to adopt an Environmental Assessment (EA) prepared by the U.S. Army Corps of Engineers (COE) as part of the regulatory review of a permit application submitted by the La. Department of Wildlife and Fisheries (LDWF) (USDA 1996). The proposed activities cited in LDWF's application were, in part, the same activities proposed for the TE-29 Project. Therefore, the COE's EA addressed the potential environmental impacts associated with the TE-29 project and served to meet the requirements of National Environmental Policy Act (NEPA) and the NRCS (7 CFR 650). Although the majority of activities proposed in this TE-48 Project parallel that addressed by the COE's EA, NRCS decided to develop an updated, comprehensive Plan/Environmental Assessment, which is the subject document.

Emergent and Submerged Aquatic Vegetation

Alternative 1: The Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) Environmental Workgroup (2004) estimated that, with the current rate of land loss from shoreline erosion, nearly 62 acres of emergent barrier island habitat would be lost over the next 20 years. Without project installation, current land loss rates are expected to continue in areas presently unprotected by existing structures, and may even accelerate as the barrier island deteriorates. As the Raccoon Island profile decreases in elevation and width, vulnerability to overwash and breaching increases, and the gradient platform necessary for diverse plant communities to persist will be lost.

Alternative 2: The segmented breakwater structures will front 58 acres of the vegetated portion of the barrier island that is projected at the current rate of erosion to be completely lost within the next 20 years. The segmented breakwaters will not only protect this area by significantly reducing the erosion rate but will promote sediment accretion and create 18 acres of barrier island habitat, which will further offset the rate of erosion.

Alternative 3: The segmented breakwaters, which will reduce erosion and promote accretion, combined with the marsh creation component are predicted to create a total of approximately 78 new acres of subareal habitat (CWPPRA Environmental Workgroup 2004). Project components will also protect and enhance existing vegetated areas by providing protection from direct wave erosion and contributing additional sediments and nutrients into the system. The restoration of the dune-to-back barrier elevational gradient followed by appropriate plantings of emergent vegetative species will help increase important barrier island plant communities on Raccoon Island and enhance the associated erosion protection and habitat functions. No short- or long-term impacts are expected to occur to existing emergent vegetation habitat.

Based upon previous analysis, it should be noted that some down-drift effects may possibly occur on the intertidal spit area in the form of an erosional shadow as a result of the breakwater placement. Stone et al. (2003) estimated that the existing breakwaters (TE-29) have an 1800 ft' erosional shadow. The CWPPRA Environmental Workgroup (2004) used

this erosion rate to estimate that the spit would lose a total of 23 acres (19%) over the 20-year project life as a result of the down-drift effect of the proposed TE-48 breakwaters (Phase A). Nevertheless, with the losses that could occur to the spit area, projected Future with Project (FWP) analysis indicates a net benefit of 16 acres by the segmented breakwaters over the 20 year life of the project.

Water Quality

Alternative 1: The No Action alternative will not change or alter the quality and condition of water found in the project area.

Alternative 2: Installation of the shoreline protection features associated with this alternative would cause temporary disturbance of gulf bottom materials resulting in increased turbidity in the immediate area of construction. No dredging for construction equipment access is anticipated for this phase of the project therefore cumulative adverse impacts to water quality are short term and minimal.

Alternative 3: Short term moderate impacts to water quality are anticipated with the marsh creation phase (Phase B) of the project. Increased turbidity levels are expected on the bay side outfall of all designated dewatering sites along the retention dike and at the borrow site. Geotechnical surveys and analysis conducted during the design phase of the project will determine the borrow source of dredged material and the construction method and type of material for the retention dike. Consideration will be given in the design of such activities to provide the least amount of impact to local water quality conditions.

No impacts to salinity levels within the project area are anticipated as a result of the construction of this project.

Air Quality

Alternative 1: The no action alternative would have no impact on present conditions.

Alternative 2: This alternative would have no long-term adverse impact on present conditions, but could have short-term negative impacts during construction. An analysis for total direct emissions was based upon the estimated construction hours and subsequent horsepower output of this project. Categories of emissions from nitrogen oxides (NO_x) and volatile organic compounds (VOC's) were evaluated. The total tons of VOC emissions for this project were calculated to be 0.01 tons, which is significantly lower than the threshold limit applicable to VOC's for parishes where the most stringent requirement (50 tons per year) is in effect. Exhaust emissions from construction equipment should be quickly dissipated by prevailing winds.

Alternative 3: Same as Alternative 2

Fish and Wildlife Habitat

Alternative 1: Continued degradation of the island will directly affect wildlife populations in the project area in an adverse manner. The decline in productivity of the area for many species of wildlife, primarily nesting colonial waterbirds, will likely be continual, until all emergent marsh and beach has been lost. The loss of Raccoon Island, primarily due to its seclusion, lack of predators and human disturbance will mean the loss of one of the most important breeding areas for brown pelicans, roseate spoonbills and reddish egrets in the state (Vermillion 2003, personal communication). Continued deterioration of woody shrubs and

beach habitat will also result in the loss of this important resting and refueling area for migratory neotropical species as well as migrating shorebirds. As emergent marsh is lost through conversion to open water, fisheries populations may show a short-term increase due to the introduction of detrital material and the resulting increase in the food web base. Fisheries production will then decline dramatically as the remaining marsh estuary is completely converted to open gulf. Once the island is lost, the current importance of the area to sport fishing will be substantially reduced.

Alternative 2: With the implementation of this project, it is anticipated that the loss of emergent marsh would be reduced; thus the project area will continue to provide suitable habitat for a wide range of fish and wildlife species. Construction of eight additional breakwaters on the western gulf side of the island is anticipated to re-establish intertidal areas from the existing beach gulfward to the breakwaters, much as the existing breakwaters have accomplished in the past. These areas beyond the breakwaters have been the most utilized for colonial seabird nesting. These breakwaters will also protect the island from constant erosional forces, especially during hurricane and tropical storm events, and significantly enhance the recovery process of reestablishing existing habitat.

A detailed sediment budget analysis in support of the project (Thomson et al. 2004) has indicated that construction of breakwaters typically reduces the westward flow of sediments as these sediments tend to be captured in the lee of the breakwaters. In this case, the capture of sediments moving longshore may have the effect of reducing the westward flow of sediments to the spit and result in some accelerated erosion in portions of this area that currently serves as feeding and resting habitat for numerous fish and wildlife species. While the overall project is expected to improve the net conditions for most fishery species, there may be potential impacts to fishery species that utilize the barrier island sand flats and surf zone habitats (e.g. gulf menhaden, white and striped mullet, red drum, lesser blue crab, spot, pompano, and anchovies).

Alternative 3: In addition to the benefits of segmented breakwaters, increasing the subaerial habitat through marsh and dune creation on the bayside is anticipated to have a positive impact on nesting colonial waterbird use as well as that of migrating neotropical and shorebird species. Portions of the created subaerial habitat are anticipated to become vegetated by shrubby species. Protection and probable creation of woody habitat will insure the availability of important neotropical habitat, which is important during both spring and fall migration, and colonial waterbird nesting habitat. Estuarine fishery dependent species should greatly benefit with the increase in intertidal area and tidal creeks from marsh creation areas. Shallow areas of the back bay are expected to naturally reconnect to intertidal channels and allow for fish access via constructed openings in the retention levee. Constructed breakwaters will also provide unique habitat for additional fisheries species, while providing additional sport fishing sites. Some potential impact to wildlife and fisheries that utilize the spit may occur as described in Alternative 2, but these impacts are expected to be offset by the benefits gained as a result of the breakwaters. Some short-term adverse effects can be expected in areas adjacent to construction sites on very slow-moving and sedentary organisms. However, no adverse long-term effects are expected as a result of construction and conditions should again be suitable for fish and wildlife production shortly after construction is complete. All construction activities will be performed in such a manner as to minimize effects on wildlife and fishery species. Access for aquatic organisms may be limited by certain structural measures planned in some areas for a limited amount of time, but should not be detrimental to the population as a whole due to numerous connections with other nearby areas of suitable habitat.

Threatened and Endangered Species

Alternative 1: Continued degradation and loss of emergent wetlands will have a direct adverse effect on the feeding and nesting habitat of the brown pelican in the project area. It will also adversely affect the migrating piping plover with loss of critical habitat.

Alternative 2: Construction will be done in cooperation with the U.S. Fish and Wildlife Service with respect to federally protected wildlife species and Section 7 consultation and the Louisiana Department of Wildlife and Fisheries with respect to activities regulations for Isles Dernieres Barrier Islands Refuge (Appendix D), in particular to insure protection of the brown pelican and critical habitat necessary for the piping plover. The overall effect of the project will be to protect and increase the resource that currently supports the largest nesting colony of brown pelicans in the state. It is the opinion of NRCS that no adverse impacts to any threatened or endangered species will result from project implementation. In a letter dated September 18, 2004 (Appendix E), the USFWS has expressed concurrence with the NRCS determination that the proposed action will not likely adversely affect the brown pelican, the piping plover, or the designated critical habitat of the piping plover.

Alternative 3: Same as Alternative 2

Essential Fish Habitat (EFH)

Alternative 1: The No Action Alternative would allow a substantial decrease in the quality of the project area's EFH due to the loss of emergent marsh and shallow water areas over time. The project area's ability to support Council-managed species (white shrimp, brown shrimp, and red drum) would therefore be reduced. Furthermore, Alternative 1 would adversely impact estuarine-dependent species (such as spotted seatrout, gulf menhaden, striped mullet, and blue crab) that are preyed upon by other Council-managed species (such as mackerels, red drum, snappers, and groupers) and highly migratory species (such as billfish and sharks).

Alternative 2: Shoreline protection provided by the breakwaters will protect the quality of the project area's EFH by reducing the high rate of erosion that currently exists in the unprotected western end of the vegetated portion of the island. Because this area is projected to be completely lost within the next 20 years, most of the current ability of the project area to support Council-managed species (white shrimp, brown shrimp, and red drum) will also be maintained and enhanced. Support of estuarine-dependent species (such as spotted seatrout, gulf menhaden, striped mullet, and blue crab) that are preyed upon by other Council-managed species (such as mackerels, red drum, snappers, and groupers) and highly migratory species (such as billfish and sharks) will also be maintained and enhanced.

Alternative 3: The addition of rock breakwaters and marsh creation will increase the available habitat required for juveniles to escape predation and therefore increase the quality of EFH. However, because the project will not completely eliminate the loss of emergent marsh, there will be a decrease in the quality of the project area's EFH over time, albeit at a much slower rate than with Alternative 1. Furthermore, short-term impacts associated with project construction include localized increase in turbidity and suspended solids during construction, replacement of some existing shallow water areas with subaerial conditions (or areas) and localized destruction of some non-mobile benthic organisms and their habitat.

The downdrift impacts to the western sand spit may also result in the loss of some habitat. However, the spit is ephemeral in nature and is expected to continue to increase and decrease through time, regardless. It is expected that any loss as a result of the downdrift effects of the new breakwaters will be offset by the sand accumulation in the new breakwater field and

behind the eastern groin. Also, an increase in emergent estuarine area is anticipated with the marsh creation component. The additional breakwaters included in this project will also ensure the longevity of the barrier island habitat. This has been proven with the existing breakwaters.

Long-term adverse impacts may occur to shallow water dependent marine species that currently utilize the western intertidal extension of the island (i.e. sand spit) as a result of the deprivation of longshore sediment transport caused by the downstream shadow effect of the proposed breakwaters. Such adverse impacts may be mitigated however, by the possible creation of beach front salients behind the proposed breakwaters and continued littoral movement of material bypassing the breakwaters. There are varying opinions from the professional and academic community regarding this issue. The project has been tasked with “project specific monitoring” which will determine post-construction impacts of the proposed measures. If such impacts are considered significantly detrimental to EFH species, remedial measures will be included in Phase B of the project.

Migratory Birds

Alternative 1: Continued habitat loss is in direct conflict with Executive Order 13186 of January 10, 2001, as described in “Fish and Wildlife” habitat paragraphs within this section.

Alternative 2: In compliance with EO 13186, this alternative will protect important migration rest and refueling habitat for neotropical migrants as well as habitat that is considered one of the most important nesting areas for the endangered (E) brown pelican and numerous other species of colonial waterbirds. The breakwaters are expected to significantly reduce erosion to the western half of the vegetated portion of the island, which includes various types of habitat including flats and beaches, saltmarsh, wetland scrub-shrub, vegetated and unvegetated dunes, all of which provide a unique array of habitat types for migratory birds.

Alternative 3: In addition to the benefits provided in Alternative 2 (Phase A), which is designed to protect existing habitat, Alternative 3 creates additional important neotropical migrant habitat. Woody and herbaceous plant species planted on newly created dune and supratidal backfilled areas will complement the existing island habitat. As Raccoon Island is one of the most important nesting areas for brown pelicans and reddish egrets in Louisiana, the created habitat will significantly contribute to the important habitat available for brown pelicans and other species of colonial waterbirds. In addition to the resting, foraging, and nesting habitat it will provide to many other waterbird species, this newly created area will also expand crucial habitat for many neotropical migrants to rest and refuel during spring and fall migration.

Cultural Resources

Alternative 1: The future without project conditions for cultural resources would be expected to remain similar to existing conditions.

Alternative 2: Since there are no known cultural resources within the project area, the shore protection alternative is not anticipated to have any significant impacts. If any archaeological sites or cultural resources are discovered during the project planning/construction process, the proper steps will be taken to ensure protection of the site.

Alternative 3: Same as Alternative 2.

Risk and Uncertainty

There is an intrinsic degree of risk and uncertainty in all coastal wetland restoration projects. Variances in environmental factors, patterns, and conditions are too numerous to allow exact predictability of success. The best guidelines that planners and designers can follow are past successes. Overall results of the TE-29 Raccoon Island Demonstration Project were very successful thus far. Results expected from the TE-48 Project are not totally predicated upon the success of the demonstration project. As a result of the 30% Design Review Meeting for the Phase A portion of this project, a Sediment Budget Report was generated by Coastal Planning & Engineering, Inc., under contract with LDNR (Thomson et al. 2004). The purpose of the report was to better enable the prediction of shoreline response to NRCS's initial proposed breakwater designs and narrow the uncertainty of potential impacts (i.e. erosional shadow or down-drift effects).

The primary purpose of the TE-48 Project is to extend the longevity of the island and its critical habitat. Implementation of the proposed measures of this project will not completely eliminate wetland losses. Instead, the project proposes to reduce the rate of shoreline retreat and enhance habitat conditions for a multitude of avian species, some of which are considered rare and endangered.

Southern Louisiana carries the inherent risk of severe weather (e.g. tropical storms, hurricanes, storm tides), which frequently causes irrevocable damage to barrier islands and associated wetlands. The Raccoon Island Shore Protection/Marsh Creation Project, with its exposure to the gulf and large open back bay areas, carries an additional degree of risk and uncertainty when contemplating the maintenance of a barrier island for the sustainability and longevity of the project.

Concerns have been raised regarding the potential hazard that the offshore segmented breakwaters may pose to marine traffic should the island retreat away from them. Research has shown that the barrier islands in the Isle Dernieres chain typically retreat (i.e. roll back) inland during their life span. Raccoon Island has differing distinctive features compared to other islands immediately to the east, in that the island is losing surface area "in-place" more so than migration (rollover). A recent photo analysis conducted by the USGS National Wetland Research Center covering the time period from 1956 to 2003 supports this analogy (Handley et al. 2005). As a result of this analysis and similar findings in other scientific reports, NRCS does not consider the breakwaters becoming a navigational hazard a long term or severe risk. Regardless, if during the life of this project, the breakwaters become a navigational hazard as classified by the U.S. Coast Guard, remedial measures shall be taken to remove the breakwaters as part of the Operation and Maintenance phase.

Rationale for Plan Selection

The goals of the project are to reduce the rate of shoreline retreat, protect and enhance existing critical habitat, and create over 60 acres of new barrier island habitat for avian species. The proposed strategies for achieving these goals are to significantly reduce the wave energy impacting the gulf shoreline utilizing segmented breakwaters, create an intertidal buffer with dredged material to extend the longevity of existing and created bayside dune and supratidal areas, and plant newly created dune and supratidal areas on the northeast side of the island with woody and herbaceous plant species that are native to gulf coast barrier islands. While attempting to implement these strategies, it is important to consider options which minimize potentially negative impacts to natural resources occurring both inside and outside the project area. NRCS, landowners, and participating agencies all concur that shoreline protection in combination with marsh creation is the most effective means of

protecting and enhancing the vital resources within the project area. The Shore Protection/Marsh Creation alternative has a high probability of meeting the goals and objectives set forth by the landowners and CWPPRA agencies without causing significant adverse impacts. Therefore, it is the recommended alternative for the TE-48 Raccoon Island Project.

Consultation and Public Participation

The restoration and protection of coastal wetlands in Louisiana is a leading concern of the state's citizens. Many state, federal, and local agencies and special interest groups have taken an active role in the conservation of Louisiana's wetlands. Public involvement and input in solving the state's coastal land loss problems are crucial to the success of the program.

The Raccoon Island Shore Protection/Marsh Creation Project (TE-48) was submitted by a state resource agency as a candidate project for the CWPPRA Eleventh Priority Project List for the Coast 2050 Region 3 area. The project was then approved by the CWPPRA Task Force for Phase 1 state and federal funding. Comments and input on planned structural measures and components of the project will be solicited from state and federal agencies, landowners, landusers and the general public. Two 30% Design Review Meetings (Sept 2003, July 2004) and a 95% Design Review Meeting (Sept 2004) was held with state and federal agencies as a Standard Operating Procedure requirement for CWPPRA Projects. The Phase A (shoreline protection) portion of the project obtained Phase 2 Task Force approval in October 2004. NRCS anticipates requesting Phase 2 approval for the Phase B (marsh creation) portion in 2006. All comments received will be considered in final project planning and design. The project will also undergo additional public reviews in separate phases of project implementation.

This document has been coordinated with appropriate congressional, federal, state, and local interests, as well as other interested parties. The Plan/EA and the associated unsigned Finding of No Significant Impact will be sent to:

U.S. Department of Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency, Region VI
U.S. Department of Commerce, National Marine Fisheries Service
U.S. Department of Army, Corps of Engineers
Advisory Council on Historic Preservation
Governor's Executive Assistant for Coastal Activities
Louisiana Department of Wildlife and Fisheries
Louisiana Department of Natural Resources
 Coastal Management Division
 Coastal Restoration Division
Louisiana Department of Environmental Quality
Louisiana State Historic Preservation Officer, Division of Archaeology
Louisiana Universities Marine Consortium

Representatives from the Louisiana Department of Natural Resources/Coastal Restoration Division (LDNR/CRD), LDNR/Coastal Engineering Division (LDNR/CED) and Louisiana Department of Wildlife and Fisheries (LDWF) participated in multiple field investigations of the project area with NRCS personnel (USDA 2003). The LDNR/CRD & CED, and LDWF provided technical data and assistance to NRCS. Comments previously received from the Louisiana Coastal Wetlands Conservation Restoration Task Force agencies and landowners have been incorporated into the development of the project plan. In addition, all comments

received during the public notice period of the COE 404-permit application will be considered.

Recommended Plan

Purpose and Summary

The primary objectives of the project are to significantly reduce the wave energy impacting the gulf shoreline, create an intertidal buffer to extend the longevity of existing and created bayside dune and supratidal areas, and provide additional critical nesting, foraging, and resting habitat for brown pelicans, colonial waterbirds, and neotropical migrants. Project objectives will be accomplished by using structural and non-structural means to dampen wave energies from the Gulf of Mexico, create approximately 78 acres of barrier island habitat and incorporate vegetative plantings utilizing woody and herbaceous plant species. The alternatives developed have been analyzed for their ability to meet project objectives and avoid or minimize impacts to critical resources. The Shoreline Protection/Marsh Creation alternative has been determined to most adequately meet project objectives, while enhancing and protecting native resources. Geotechnical and survey data currently being collected by LDNR and NRCS will be analyzed during the project's Phase 1 process to determine whether project shoreline protection and marsh creation measures will have the ability to accomplish project objectives. The critical parameters being analyzed are soil foundation conditions for the breakwaters and marsh creation area and the quality and source of dredged borrow material.

Proposed Measures

Project features and their locations are identified in Figure 4. Current field data has been obtained throughout the project area during several field trips conducted by NRCS, LDNR/CED & CRD and LDWF personnel (USDA-NRCS). Typical drawings of the proposed structures are included in Appendix B. Structural and non-structural measures planned include the following components:

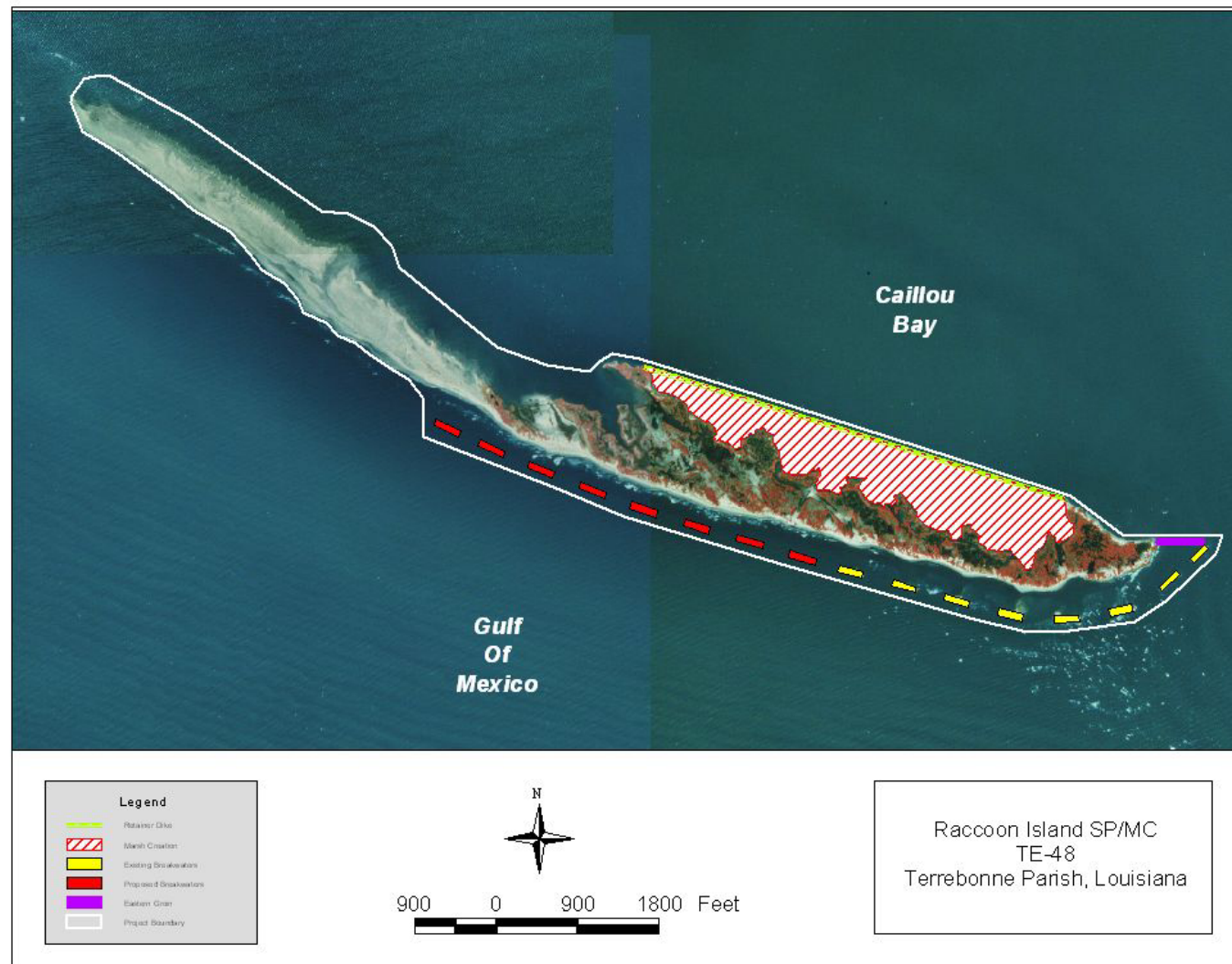
- (A) Eight (8) segmented rock breakwaters;
- (B) A terminal groin structure extending from the easternmost end of the island to existing breakwater 0;
- (C) Create approximately 60 acres of additional barrier island habitat;
- (D) Plantings of woody and herbaceous plant species.

Structure Descriptions

- (A) Eight additional segmented breakwaters will be constructed as a westward continuation of the Raccoon Island Breakwaters Demonstration Project (TE-29). Due to the proven success of the demonstration project, the configuration of the additional breakwaters will closely replicate that of the existing demonstration project contingent on the results of engineering and geotechnical surveys and sediment budget modeling results.
- (B) To enhance protection of the eastern gulf shoreline of the island, an eastern terminal groin extending from the shoreline to existing breakwater 0 will be

Figure 4. Project Features Map.

Figure 4. Project Features Map.



constructed. The proposed eastern groin will eliminate the erosive tidal currents that flow between the shoreline and existing breakwaters 0, 1, and 2 and promote accretion behind these breakwaters.

- (C) Hydraulically dredged material will be strategically deposited within an open water area in the northeast quadrant of the island in an attempt to create an additional 60 acres of emergent and intertidal wetlands. Geotechnical investigations and analysis results will provide an insight as to the source, location of, and stacking potential of the borrow material. A best-case scenario will have dredged material deposited, unconfined, at differing heights to create a range of habitats (dune, supratidal, & intertidal). The projected settled height of the dune would be +5.0 ft. NAVD88. If physical properties of the borrow material warrant confined placement, a retainer dike will be constructed along the northern perimeter of the habitat creation area for an approximate length of 5,000 ft. and to a height of +2.0 ft. NAVD88. Material and methods used for the retainer dike will depend on the results of geotechnical investigations and analysis. The dike will be breached at an appropriate time after construction to allow a tidal connection between Caillou Bay and interior ponds and creeks.

Non-Structural Descriptions

- (D) Appropriate application of vegetation plantings will be made on newly created disposal areas. The selection of plant species will be based on the finished elevations of subareal and intertidal habitat. For example, protected intertidal zones in the marsh creation area will be planted with a combination of black mangrove and smooth cordgrass. Areas at marsh elevation will be planted with marshhay cordgrass. Areas of high marsh through dune elevation may be planted with a combination of marshhay cordgrass and bitter panicum (*Panicum amarum*). If sufficient elevation is achieved, plantings of other woody plant species, such as wax myrtle, marshelder, matrimony vine, or Hercules club (*Zanthoxylum clava-herculis*), may also be determined appropriate. Final design and species composition of all vegetation applications will be determined in consultation with LDWF and LDNR.

Permits and Compliance

All necessary permits and approvals will be obtained before project construction commences. Applicable federal statutes are shown in Table 1. The proposed action is not expected to cause adverse environmental impacts requiring environmental mitigation.

Table 1. Environmental Compliance

STATUTE	COMPLIANCE
Archaeological and Historic Preservation Act	Full
Clean Air Act, as amended	Full
Coastal Barrier Resources Act (PL 97-348; 1982)	Full
Coastal Zone Management Act of 1972, as amended	Full
Endangered Species Act of 1973, as amended	Full
Executive Order 11988, Floodplain Management	Full
Executive Order 11990, Protection of Wetlands	Full
Farmland Protection Policy Act	Full
Federal Water Pollution Control Act	Full
National Environmental Policy Act of 1969, as amended	Pending*
National Historic Preservation Act of 1966, as amended	Full
Magnuson-Stevens Fishery Conservation and Management Act	Full
Subtitle B, Highly Erodible Land Conservation, and Subtitle C, Wetland Conservation, of the Food Security Act of 1985	Full
Wild and Scenic River Act, as amended	Full
Executive Order 13186, Protection of Migratory Bird Habitat	Full

* Full compliance and applicable documentation will be completed prior to construction.

Costs, Financing, and Installation

Total project cost was estimated and includes all aspects of planning, engineering, administration, landrights acquisition, construction, inspection, monitoring, and operations and maintenance. Cost information is provided in Appendix C.

Planning, engineering, design, and pre-construction monitoring of the TE-48 Project have been funded under CWPPRA. Planning, engineering, and design for the Phase A portion of the project is substantially complete. NRCS requested and obtained approval for Phase 2 funding of Phase A from the Technical Committee at their September 9, 2004, meeting and from the Task Force at their October 13, 2004, meeting. Construction is anticipated to begin in August 2005. NRCS is currently progressing towards the 30% Design Review level for Phase B. The project will be cost-shared between the federal sponsoring agency (NRCS) and the State of Louisiana (LDNR). Pursuant to the Louisiana Coastal Wetlands Conservation Plan's approval on November 30, 1997, the federal government provides 85% of the project cost and the State of Louisiana provides the remaining 15%.

Project implementation and management will be administered by NRCS in cooperation with LDNR/Office of Coastal Restoration and Management (OCRM).

Operation, Maintenance, and Rehabilitation

As phases of the Raccoon Island Shore Protection/Marsh Creation Project are approved for construction, funding for post-construction monitoring, operation, maintenance, and rehabilitation is made available on a 3-year cycle over the 20-year project life. LDNR is responsible for monitoring. Operation, maintenance, and rehabilitation will be administered by LDNR in cooperation with NRCS.

Conclusion

The United States Department of Agriculture, Natural Resources Conservation Service finds no significant long-term adverse impacts to wetlands, water quality, threatened or endangered species, species managed by Gulf of Mexico Fishery Management Council or their essential habitat, other fish and wildlife resources, recreational or socio-economic resources, or cultural resources associated with the Raccoon Island Shore Protection/Marsh Creation Project (TE-48). Project implementation is expected to reduce the rate of gulf shoreline retreat, enhance and protect existing critical barrier island habitat, and create new habitat for avian species. The project will produce net long term benefits to project area resources.

List of Document Preparers

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Mike Tullos	Soil Conservationist	Natural Resources Conservation Service
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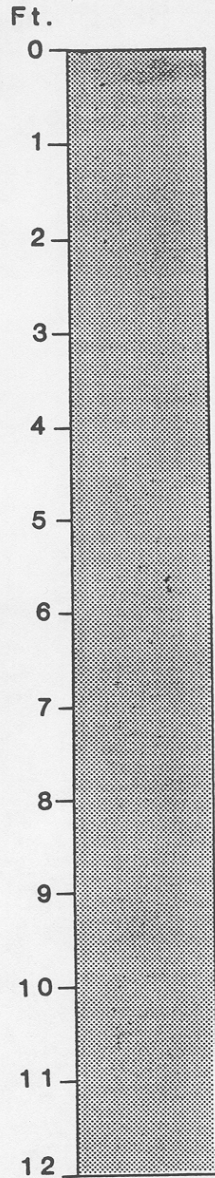
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Appendices

Appendix A – Soil Profiles

SOIL PROFILE

FELICITY SERIES



This series consists of somewhat poorly drained soils which occupy nearly level to gently undulating areas adjacent to Gulf Coastal beaches. These soils formed in sandy coastal sediments. Slopes range from 0 to 3 percent. They are subject to flooding by salt water during high storm tides.

Felicity soils are associated with Bellpass and Scatlake soils. Both the organic Bellpass soils and the semifluid, clayey Scatlake soils occupy lower elevations on broad tidal marshes. In a few places, Felicity is adjacent to Placedo soils on the landscape. The clayey Placedo soils are also in lower positions of the landscape than Felicity soils.

Soil Characteristics

Typically the Felicity soils have a surface layer of grayish brown, moderately alkaline loamy fine sand about 13 inches thick. The underlying layers are moderately alkaline dark brown, dark grayish brown or dark gray loamy fine sand.

Use and Management

This soil is not suited to cultivated crops, pasture, and woodland. This soil is very poorly suited to use as wetland wildlife habitat. It provides only a limited food supply and is used mainly as a resting area by ducks and shore birds and as sites for summer cottages. The natural vegetation commonly is sparse and consists mainly of marshhay cordgrass, black-mangrove, bigleaf sumpweed, bitter panicum, seashore saltgrass, saltwort, and smooth cordgrass. This soil is not suited to urban uses and intensive recreation.

The dominant limitations influencing the use and management of the Felicity soils are flooding, wetness, and salinity.



ORGANIC



SANDY



LOAMY

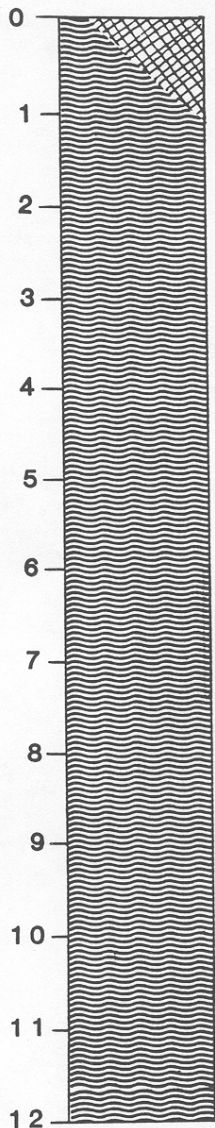


CLAYEY

SOIL PROFILE

SCATLAKE SERIES

FT.



This series consists of very poorly drained semi-fluid mineral soils which occupy large saltwater marsh areas. These soils are near mean sea level along the seaward side of the marshland. The mean salinity is 16 ppt.

Scatlake soils are geographically associated with the Felicity, Bell Pass, and Timbalier soils of the salt marsh and less commonly adjoin the Lafitte and Clovelly soils of the brackish marsh. Bell Pass, Timbalier, Lafitte, and Clovelly soils are organic. The Felicity soils are sandy beach ridges.

Soil Characteristics

Typically, the surface layer is very dark gray muck about 6 inches thick. The underlying layers, to a depth of 60 inches or more, are semi-fluid gray alkaline clay.

Use and Management

The major land use for this soil is related to wildlife and recreation. The area is commonly used for hunting, trapping, and fishing. It provides habitat for moderate concentrations of geese, muskrat, mink, otter, and raccoon. This soil is part of an estuary that provides a nursery for saltwater fish and crustaceans. These fish and estuarine larval forms are the basis for a large fishing industry. The typical plants growing on this soil are marshhay cordgrass, needlegrass rush, seashore shortgrass, smooth cordgrass, bushy sea-oxeye, salt wort, and Virginia swampfire.

The dominant limitations influencing the use and management of this soil are low bearing strength, deep flooding during storms, very high shrink-swell potential, and salinity. Structures such as weirs require piling due to the low soil strength. If the soil is drained it will lose 3 to 15 inches elevation from subsidence, and will become acid. The upper 20 to 30 inches of the soil will become firm a few years after drainage, but below this depth the soil will remain semi-fluid.



ORGANIC



SANDY

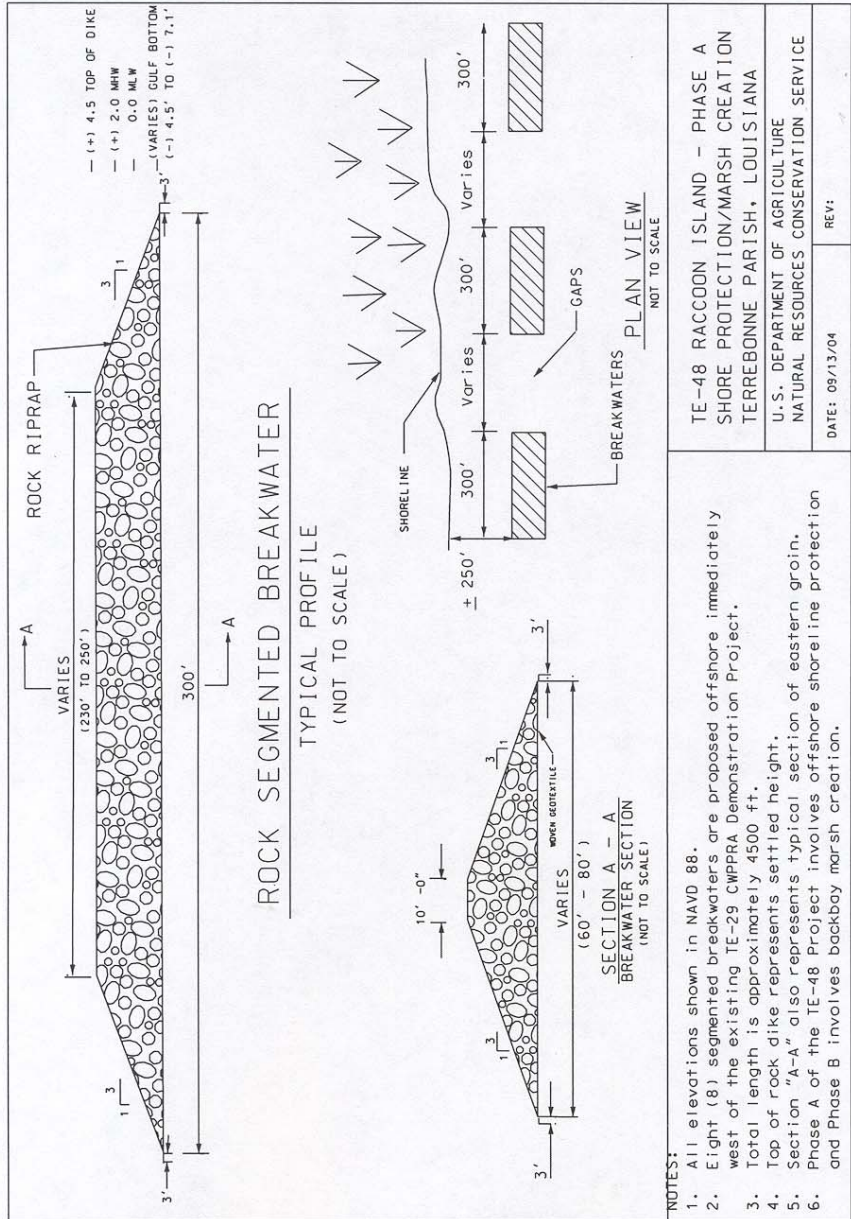


LOAMY



CLAYEY

Appendix B – Typical Structure Drawings



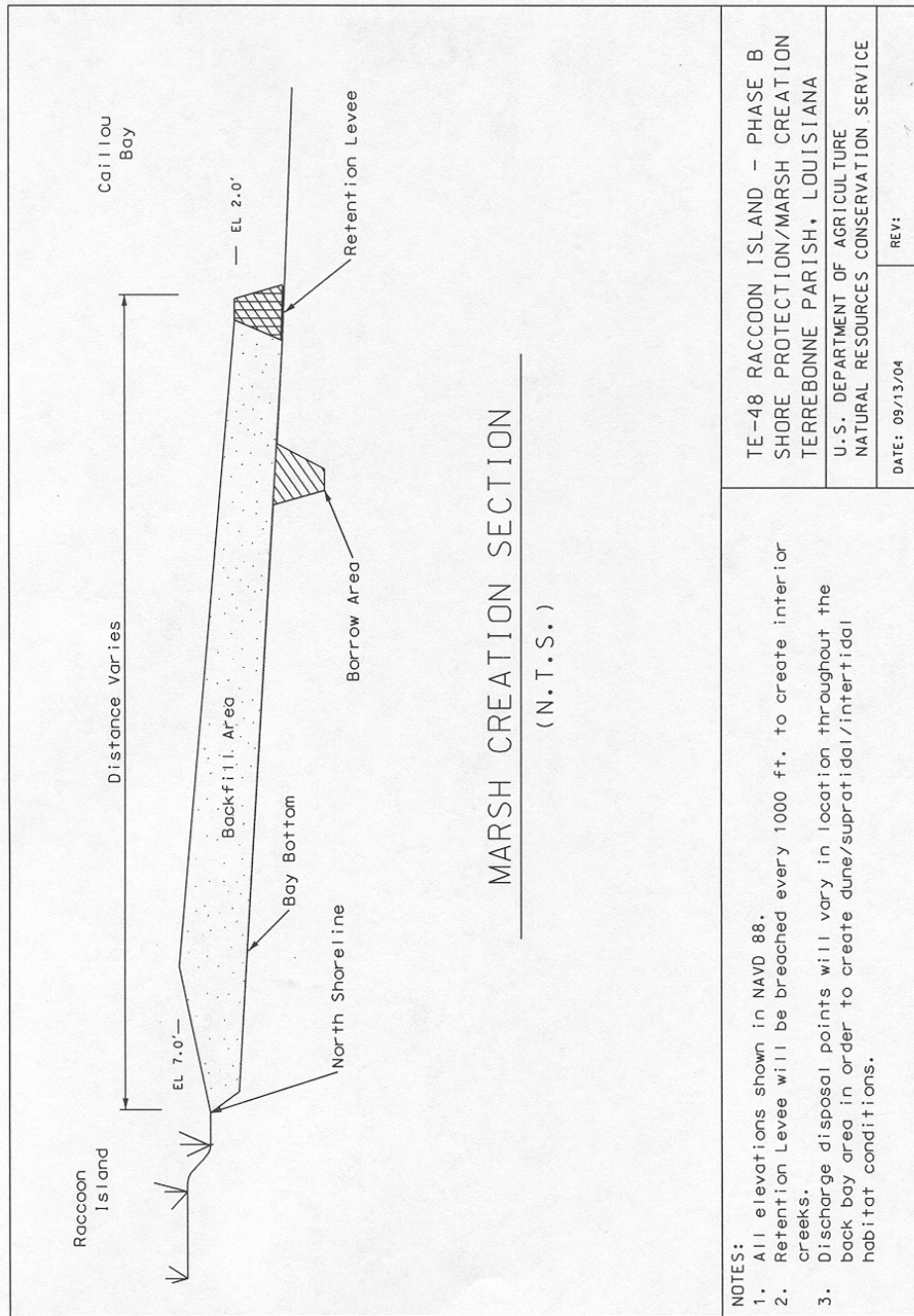
NOTES:

1. All elevations shown in NAVD 88.
2. Eight (8) segmented breakwaters are proposed offshore immediately west of the existing TE-29 CWPRA Demonstration Project.
3. Total length is approximately 4500 ft.
4. Top of rock dike represents settled height.
5. Section "A-A" also represents typical section of eastern groin.
6. Phase A of the TE-48 Project involves offshore shoreline protection and Phase B involves backbay marsh creation.

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TE-48 RACCOON ISLAND - PHASE A
SHORE PROTECTION/MARSH CREATION
TERREBONNE PARISH, LOUISIANA
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DATE: 09/13/04 REV:



NOTES:

1. All elevations shown in NAVD 88.
2. Retention Levee will be breached every 1000 ft. to create interior creeks.
3. Discharge disposal points will vary in location throughout the back bay area in order to create dune/supratidal/intertidal habitat conditions.

TE-48 RACCOON ISLAND - PHASE B
SHORE PROTECTION/MARSH CREATION
TERREBONNE PARISH, LOUISIANA
U.S. DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

DATE: 09/13/04

REV:

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Appendix C – Cost Information

Coastal Wetlands Conservation and Restoration Plan Priority Project List XI
Raccoon Island Breakwaters - Phase II (TE-14-2)

Project Construction Years:	4	Total Project Years	24
Interest Rate	6.125%	Amortization Factor	0.088071
Fully Funded First Costs	\$10,037,900	Total Fully Funded Costs	\$10,355,700

Annual Charges	Present Worth	Average Annual
First Costs	\$10,195,850	\$897,983
Maintenance	\$50,393	\$5,583
O & M Costs	\$41,055	\$3,880
Other Costs	\$7,530	\$663
Total	\$10,310,800	\$908,100

Average Annual Habitat Units	138
Cost Per Habitat Unit	\$6,595
Total Net Acres	223

**Coastal Wetlands Conservation and Restoration Plan
Raccoon Island Breakwaters - Phase II (TE-14-2)**

Project Costs

Phase Year	Fiscal Year	E&D	Land Rights	Federal SSA	LCMR SSA	Corps Proj./Non-Monitoring	SSI	Contingency	Construction Costs	Total First Cost
Phase I	0 Compound									\$0
	4 Compound	2002	\$3,500	\$52,675	\$52,675	\$663	\$0	\$0	\$0	\$329,313
	3 Compound	2003	\$76,800	\$6,000	\$90,300	\$663	\$16,800	\$0	\$0	\$580,863
	2 Compound	2004	\$31,400	\$500	\$7,525	\$332	\$5,737	\$0	\$0	\$53,019
	TOTAL		\$628,000	\$10,000	\$150,500	\$1,656	\$22,537	\$0	\$0	\$963,195
Phase II	4 Compound	2002	-	-	-	-	-	\$0	\$0	\$0
	3 Compound	2003	-	-	-	-	-	\$0	\$0	\$0
	2 Compound	2004	-	-	\$110,367	\$332	\$0	\$221,173	\$4,416,867	\$5,963,322
	1 Compound	2005	-	-	\$40,133	\$663	\$5,737	\$80,427	\$1,606,133	\$2,174,760
	TOTAL		\$0	\$0	\$150,500	\$995	\$5,737	\$301,600	\$6,023,000	\$8,138,062
Total First Costs			\$628,000	\$10,000	\$301,000	\$2,653	\$26,274	\$301,600	\$6,023,000	\$9,101,277
Year	FY	Monitoring	O&M	Corps PM	Other					
1 Discount	2006	\$5,737	\$3,880	\$663	-					
2 Discount	2007	\$5,737	\$3,880	\$663	-					
3 Discount	2008	\$5,737	\$3,880	\$663	-					
4 Discount	2009	\$5,737	\$3,880	\$663	-					
5 Discount	2010	\$5,737	\$3,880	\$663	-					
6 Discount	2011	\$5,737	\$3,880	\$663	-					
7 Discount	2012	\$5,737	\$3,880	\$663	-					
8 Discount	2013	\$5,737	\$3,880	\$663	-					
9 Discount	2014	\$5,737	\$3,880	\$663	-					
10 Discount	2015	\$5,737	\$3,880	\$663	-					
11 Discount	2016	\$5,737	\$3,880	\$663	-					
12 Discount	2017	\$5,737	\$3,880	\$663	-					
13 Discount	2018	\$5,737	\$3,880	\$663	-					
14 Discount	2019	\$5,737	\$3,880	\$663	-					
15 Discount	2020	\$5,737	\$3,880	\$663	-					
16 Discount	2021	\$5,737	\$3,880	\$663	-					
17 Discount	2022	\$5,737	\$3,880	\$663	-					
18 Discount	2023	\$5,737	\$3,880	\$663	-					
19 Discount	2024	\$5,737	\$3,880	\$663	-					
20 Discount	2025	\$0	\$3,880	\$663	-					
Total		\$109,003	\$77,500	\$13,264	\$0					

**Coastal Wetlands Conservation and Restoration Plan
Raccoon Island Breakwaters - Phase II (TE-14-2)**

Present Valued Costs		Total Discounted Costs		\$10,310,638		Amortized Costs		\$508,089	
Year	Fiscal Year	E&D	Land Rights	Federal S&A	LDNR S&A	Corps Proj Man. Monitoring	Contingency	Construction Costs	Total First Cost
Phase I									
0	1,000	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	1,268	2002	\$278,894	\$4,445	\$56,815	\$84	\$0	\$0	\$417,735
2	1,195	2003	\$460,364	\$7,171	\$107,930	\$793	\$0	\$0	\$594,268
3	1,195	2004	\$35,364	\$563	\$5,475	\$373	\$0	\$0	\$59,712
4	1,268	2005	\$764,532	\$12,174	\$163,220	\$2,007	\$0	\$0	\$1,171,655
Phase II									
5	1,195	2002	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	1,268	2003	\$0	\$0	\$0	\$0	\$0	\$0	\$0
7	1,195	2004	\$0	\$0	\$124,301	\$373	\$0	\$249,097	\$474,503
8	1,268	2005	\$0	\$0	\$42,592	\$704	\$0	\$85,353	\$1,704,509
9	1,195	2006	\$0	\$0	\$166,892	\$1,077	\$0	\$334,450	\$6,679,012
10	1,268	2007	\$764,532	\$12,174	\$350,112	\$3,085	\$32,630	\$6,679,012	\$10,195,859
Total First Cost									
Year									
-1	0.942	FY 2006	Monitoring	Corps PM	Other				
-2	0.886	2007	\$5,094	\$3,656	\$825				
-3	0.837	2008	\$4,800	\$3,445	\$588				
-4	0.788	2009	\$4,523	\$3,246	\$555				
-5	0.743	2010	\$4,262	\$3,059	\$523				
-6	0.700	2011	\$4,016	\$2,882	\$493				
-7	0.660	2012	\$3,784	\$2,716	\$464				
-8	0.622	2013	\$3,566	\$2,559	\$437				
-9	0.586	2014	\$3,360	\$2,412	\$412				
-10	0.552	2015	\$3,166	\$2,272	\$388				
-11	0.520	2016	\$2,983	\$2,141	\$366				
-12	0.490	2017	\$2,811	\$2,018	\$345				
-13	0.462	2018	\$2,649	\$1,901	\$325				
-14	0.436	2019	\$2,496	\$1,789	\$306				
-15	0.410	2020	\$2,352	\$1,688	\$289				
-16	0.386	2021	\$2,216	\$1,591	\$275				
-17	0.364	2022	\$2,088	\$1,412	\$256				
-18	0.343	2023	\$1,968	\$1,331	\$241				
-19	0.323	2024	\$1,854	\$1,254	\$227				
-20	0.305	2025	\$0	\$1,182	\$214				
Total			\$63,393	\$44,055	\$7,530				

**Coastal Wetlands Conservation and Restoration Plan
Raccoon Island Breakwaters - Phase II (TE-14-2)**

Fully Funded Costs		Total Fully Funded Costs				Amortized Costs				Total First Cost
Year	Fiscal Year	E&D	Land Rights	Federal S&A	LDNR S&A	Corps Proj. Man.	Monitoring	S&I	Contingency	Construction Costs
Phase I										
0	0.000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
1	1.062	\$226,821	\$3,612	\$54,361	\$54,361	\$684	\$0	\$0	\$0	\$0
3	1.062	\$401,301	\$6,390	\$96,172	\$96,172	\$705	\$17,892	\$0	\$0	\$0
2	1.099	\$34,512	\$550	\$8,271	\$8,271	\$364	\$6,306	\$0	\$0	\$0
	TOTAL	\$662,647	\$10,552	\$158,803	\$158,803	\$1,755	\$24,188	\$0	\$0	\$0
Phase II										
4	1.032	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
3	1.065	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
2	1.099	\$0	\$0	\$121,305	\$121,305	\$364	\$0	\$243,093	\$1,213,650	\$4,854,599
1	1.134	\$0	\$0	\$45,522	\$45,522	\$752	\$6,507	\$91,226	\$455,450	\$1,821,799
	TOTAL	\$0	\$0	\$166,827	\$166,827	\$1,117	\$6,507	\$334,319	\$1,669,100	\$6,676,398
Total Cost		\$662,600	\$10,600	\$325,600	\$325,600	\$2,900	\$30,700	\$334,300	\$1,669,100	\$6,676,400
Year		FY	Monitoring	OM&M	Corps PM	Other				
-1	1.171	2006	\$6,716	\$4,542	\$776					
-2	1.206	2007	\$6,930	\$4,687	\$801					
-3	1.247	2008	\$7,152	\$4,837	\$827					
-4	1.287	2009	\$7,381	\$4,982	\$853					
-5	1.326	2010	\$7,610	\$5,127	\$879					
-6	1.370	2011	\$7,851	\$5,277	\$909					
-7	1.414	2012	\$8,113	\$5,437	\$938					
-8	1.469	2013	\$8,372	\$5,602	\$968					
-9	1.506	2014	\$8,640	\$5,843	\$999					
-10	1.554	2015	\$8,917	\$6,030	\$1,031					
-11	1.604	2016	\$9,202	\$6,223	\$1,064					
-12	1.655	2017	\$9,496	\$6,423	\$1,096					
-13	1.708	2018	\$9,800	\$6,628	\$1,133					
-14	1.763	2019	\$10,114	\$6,840	\$1,169					
-15	1.819	2020	\$10,438	\$7,059	\$1,207					
-16	1.878	2021	\$10,772	\$7,285	\$1,245					
-17	1.938	2022	\$11,116	\$7,518	\$1,285					
-18	2.000	2023	\$11,472	\$7,759	\$1,326					
-19	2.064	2024	\$11,839	\$8,007	\$1,369					
-20	2.130	2025	\$0	\$8,263	\$1,412					
Total			\$171,900	\$124,600	\$21,300	\$0				

E&D and Construction Data
ESTIMATED CONSTRUCTION COST
ESTIMATED CONSTRUCTION + 25% CONTINGENCY

6,023,000
7,529,000

TOTAL ESTIMATED PROJECT COSTS

PHASE I

Federal Costs	
<i>Engineering and Design</i>	
Engineering	\$468,000
Geotechnical Investigation	\$100,000
Hydrologic Modeling	\$0
Data Collection (surveying)	\$20,000
Cultural Resources	\$10,000
NEPA Compliance	\$30,000
<i>Supervision and Administration</i>	
Supervision	\$150,500
State Costs	
<i>Supervision and Administration</i>	
Easements and Land Rights	\$150,500
Monitoring	\$10,000
Monitoring Plan Developm	\$16,800
Monitoring Protocol Cost*	\$5,737
Total Phase I Cost Estimate	\$962,000

* Monitoring Protocol requires a minimum of one year pre-construction monitoring at a specified cost based on project type and area.

PHASE II

Federal Costs	
<i>Estimated Construction Cost + 25% Contingency</i>	
Oyster leases (# of Acres)	\$3,000 per acre
Supervision and Inspecti	\$0
Supervision and Administration	\$301,600
Supervision and Administration	\$150,500
State Costs	
<i>Supervision and Administration</i>	
Supervision	\$150,500
Total Phase II Cost Estimate	\$8,132,000

TOTAL ESTIMATED PROJECT FIRST COST 9,094,000

O&M Data

Annual Costs

Annual Inspections
Annual Cost for Operations
Preventive Maintenance (Included in Annual Cost for Operations)

\$1,880
\$0
\$0

Specific Interimment Cause: NONE

Construction Items

	Year 5	Year 10	Year 15
General Structure Maintenance and Repair	\$0	\$0	\$0
Contractor Mobilization/Demobilization	\$0	\$0	\$0
Subtotal	\$0	\$0	\$0
Subtotal w/ 10% contin.	\$0	\$0	\$0
Engineer, Design & Administrative Costs			
Engineering and Design Cost	\$0	\$0	\$0
Administrative Cost	\$0	\$0	\$0
Eng. Survey	0 days @ \$1,417 per day	\$0	\$0
Construction It	0 days @ \$950 per day	\$0	\$0
Subtotal	\$0	\$0	\$0
Total	\$0	\$0	\$0

Annual Project Costs

Corps Administration
Monitoring

\$663
\$5,737

Construction Schedule

	2002	2003	2004	2005	2006	Total
Plan & Design Start	March-02	7	12			20
Plan & Design End	October-03		1			
Const. Start	February-04		11	4		15
Const. End	January-05					

Appendix D – LDWF Restrictions to Construction Activities

EXHIBIT C

Louisiana Register Vol. 25, No. 5 May 20, 1999 {PAGE }

DECLARATION OF EMERGENCY Department of Wildlife and Fisheries Wildlife and Fisheries Commission

Isles Dernieres Barrier Islands Refuge
(LAC 76:III.321 and 331)

The Wildlife and Fisheries Commission does hereby establish emergency regulations for the management of the Isles Dernieres Barrier Islands Refuge which includes Wine Island, East Island, Trinity Island, Whiskey Island, and Raccoon Island. Formerly, three of these islands, i.e., Wine, Whiskey, and Raccoon Islands, were included within the Terrebonne Barrier Islands Refuge and were regulated under provisions of LAC 76:III.321. By promulgation of this declaration of emergency, the Terrebonne Barrier Islands Refuge regulations found at LAC 76:III.321 are hereby repealed.

A declaration of emergency is necessary to regulate public access to the Isles Dernieres Barrier Islands Refuge in order to ensure that those members of the public utilizing the public use area on Trinity Island enjoy a clean and healthful environment and in order to minimize contact with the numerous species of colonial seabirds that utilize the islands as nesting habitat in the spring and summer months. This declaration of emergency will become effective on May 6, 1999 and shall remain in effect for the maximum period allowed under the Administrative Procedure Act or until adoption of the final rule.

Title 76

WILDLIFE AND FISHERIES

Part III. State Game and Fish Preserves and Sanctuaries

Chapter 3. Particular Game and Fish Preserves and Commission

§321. Terrebonne Barrier Islands Refuge

Repealed.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:6(18), R.S. 56:761 and R.S. 56:785.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 19:910 (July 1993), repealed LR 25:

§331. Isles Dernieres Barrier Islands Refuge

A. Regulations for Isles Dernieres Barrier Islands Refuge

1. Regulations for Wine Island, East Island, Whiskey Island, and Raccoon Island

a. Public access by any means to the exposed land areas, wetlands and interior waterways of these islands is prohibited. Requests to access exposed land

areas, wetlands and interior waterways shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee in the interest of conducting research on fauna and flora, of advancing educational pursuits related to barrier islands, or of planning and implementing island restoration projects.

b. Disturbing, injuring, collecting, or attempting to disturb, injure, or collect any flora, fauna, or other property is prohibited, unless expressly permitted in writing by the Secretary or his designee for the uses provided for in Paragraph 1.a. above.

c. Boat traffic is allowed adjacent to the islands in the open waters of the Gulf and bays; however, boat traffic is prohibited in waterways extending into the interior of the islands or within any land-locked open waters or wetlands of the islands.

d. Fishing from boats along the shore and wade fishing in the surf areas of the islands is allowed.

e. Littering on the islands or in Louisiana waters or wetlands is prohibited.

f. Proposals to conduct oil and gas activities, including seismic exploration, shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee, consistent with provisions of the Act of Donation executed by the Louisiana Land and Exploration Company on July 24, 1997.

2. Regulations for Trinity Island

a. Public access is allowed in a designated public use area. An area approximately 3,000 linear feet by 500 linear feet is designated as a public use area, the boundaries of which will be marked and maintained by the Department. The designated public use area shall extend westward from the western boundary of the servitude area reserved by Louisiana Land and Exploration Company in the Act of Donation a distance of approximately 3,000 linear feet and northward from the southern shoreline within this area by a distance of approximately 500 linear feet. Public recreation such as bird-watching, picnicking, fishing and overnight camping is allowed in this area. Travel on or across this area shall be limited to foot or bicycle traffic only. No use of all-terrain vehicles or other vehicles powered by internal combustion engines or electric motors shall be allowed.

b. Public access to all exposed land areas of Trinity Island, other than the public use area, is prohibited. Requests to access these exposed land areas shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee in the interest of conducting research on fauna and flora, of advancing educational pursuits related to barrier islands or of planning and implementing island restoration projects.

c. Disturbing, injuring, collecting, or attempting to disturb, injure, or collect any flora, fauna, or other property is prohibited, unless expressly permitted in writing by the Secretary or his designee for the uses provided for in Paragraph 2.b. above.

d. Any member of the public utilizing the designated public use area shall be required to have a portable waste disposal container to collect all human wastes and to remove same upon leaving the island. Discharge of human wastes, including that within the disposal container, onto the island or into Louisiana waters or wetlands is prohibited.

e. Littering on the island or in Louisiana waters or wetlands is prohibited.

f. Carrying, possessing, or discharging firearms, fireworks, or explosives in the designated public use area is prohibited.

g. Boat traffic is allowed adjacent to the island in open waters of the Gulf and bays and within the man-made canal commonly known as California Canal for its entire length to its terminus at the bulkhead on the western end of the canal. No boat traffic is allowed in other man-made or natural waterways extending into the interior of the island or in any land-locked open waters or wetlands of the island.

h. Fishing from boats or wade fishing in the surf areas of the island is allowed.

i. Houseboats may be moored in designated areas along the California Canal. An annual permit shall be required to moor a houseboat in the canal. The required permit may be obtained from the Department of Wildlife and Fisheries New Iberia Office.

j. Proposals to conduct oil and gas activities, including seismic exploration, shall be considered on a case-by-case basis and may be permitted by the Secretary or his designee, consistent with provisions of the Act of Donation executed by the Louisiana Land and Exploration Company on July 24, 1997.

B. Violation of any provision of these regulations shall be considered a Class Two Violation, as described in R.S. 56:115(D), 56:764, and 56:787.

AUTHORITY NOTE: Promulgated in accordance with R.S. 56:6(18), R.S. 56:109, and R.S. 56:781 et seq.

HISTORICAL NOTE: Promulgated by the Department of Wildlife and Fisheries, Wildlife and Fisheries Commission, LR 25:

Bill A. Busbice, Jr.
Chairman

9905#041

Appendix E – Letters of Concurrence from Agencies

United States Department of Agriculture



Natural Resources Conservation Service
646 Cajundome Blvd., Suite 180
Lafayette, Louisiana 70506

August 11, 2004

Mr. Russell Watson
Field Supervisor
U.S. Fish and Wildlife Service
646 Cajundome Boulevard, Suite 400
Lafayette, Louisiana 70506

RE: Coastal Wetlands Planning, Protection, and Restoration Act
Raccoon Island Shore Protection/Marsh Creation Project (TE-48)

Dear Mr. Watson,

As you are aware, the Raccoon Island Shore Protection/Marsh Creation Project (TE-48) has been authorized under the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA). The project is planned to be constructed in two phases. The proposed project features for Phase A include: 1) construction of eight (8) additional segmented breakwaters along the Gulf side of the island just west of the Raccoon Island Breakwaters Demonstration (TE-29) project, 2) construction of a terminal groin at the west end of the proposed breakwater field, and 3) construction of a terminal structure extending to existing breakwater 0. Phase B will include creation of over 60 additional acres of dune/supratidal habitat by depositing dredged material on the northern shoreline and subsequent planting of woody and herbaceous plant species on dune and supratidal areas.

On behalf of NRCS, I am requesting USFWS review of the attached determination by NRCS that this project would not have any significant impacts to any listed or proposed threatened or endangered species. The following attached material describes the details of the project and determination. If you or your staff have any questions regarding this matter, please contact me at (337) 291-3067.

Sincerely,

Ron Boustany (AS)

Ron Boustany
Natural Resources Specialist

cc: Quin Kinler
Mike Carloss
Loland Broussard
Britt Paul

Attachment

Project: Coastal Wetlands Planning, Protection, and Restoration Act
Raccoon Island Shore Protection/Marsh Protection (TE-48)
Threatened and Endangered Species Determination

Project Description

Raccoon Island is one of the only barrier islands along the Isle Dernieres chain with a fairly extensive wooded habitat still remaining and as such is an important nesting area for many avian species including the brown pelican (*Pelecanus occidentalis*). The proposed project will reduce the rate of shoreline erosion by lessening the direct impact of offshore wave energy south of the island and provide a buffer from wind generated waves in back bay areas by restoring dune and supratidal wetlands north of the island. Over 60 acres of new habitat for bird species will also be created.

The project objective will be accomplished in two phases. Phase A will involve installation of 8 segmented breakwaters, in addition to the already existing 8 breakwaters, along the gulf shoreline on the east end of the island along with terminal groins extending from the eastern- and western-most breakwaters to the shoreline (see attached diagram). Phase B will involve the creation of over 60 additional acres of dune, supratidal and intertidal habitat by depositing dredged material on the northern shoreline. A secondary objective is to utilize the newly created buffer area as additional avian habitat by planting woody and herbaceous plant species on dune and supratidal areas.

Threatened and Endangered Species

Based on initial consultation with the U.S. Fish and Wildlife Service (USFWS) in 2003, there is one threatened (T) and one endangered (E) species that occur within the project boundaries. Other threatened and endangered species do occur within the adjacent gulf waters but are not likely to be found within the actual boundaries of the project. As noted previously, endangered brown pelicans nest in large numbers on Raccoon Island with an estimated 5000 nests in 2004 (Hess, 2004, personal communication). In addition to Raccoon Island, endangered brown pelicans are currently nesting on Queen Bess Island, Wine Island, and scattered locations within the Chandeleur Islands chain. Nests are built in the late winter, spring, and summer, primarily in mangrove trees and other shrubby vegetation, but may also occur on the ground. Brown pelicans also utilize the shallow estuarine waters and open gulf for feeding, and the beach, sand flats and rock breakwaters as resting or loafing sites.

Threatened piping plovers (*Charadrius melodus*) migrate during the fall and spring to coastal Louisiana. These birds are primarily associated with the sand flats and beaches, and occur within the project area primarily during migration periods, but may be present in Louisiana for 8 to 10 months of the year. They arrive from their breeding grounds as early as late July and may remain until late March or April. Designated critical habitat of the piping plover are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes. These components include sparsely vegetated intertidal beaches and flats that occur between annual low tide and annual high tide and associated dunes and flats above annual high tide. Roosting plovers prefer un-vegetated or sparsely vegetated sand, mud, or algal flats above high tide. Major threats to this species in Louisiana are degradation and loss of habitat. Raccoon Island is located in Unit LA-4 of the designated critical habitat for piping plover (66 FR No. 132, pg 36074). This unit includes the entire island, where primary constituent elements occur to the MLLW. Piping plovers winter census counts

by Louisiana Department of Wildlife and Fishers accounted for 43, 0, and 32 individuals in 1991, 1996, and 2001, respectively.

The endangered Kemp's ridley (*Lepidochelys kempii*), hawksbill (*Eretmochelys imbricate*) and leatherback (*Dermochelys coriacea*) sea turtles as well as the threatened loggerhead (*Caretta caretta*) and green (*Chelonia mydas*) sea turtles occur in the Gulf of Mexico. Of these five sea turtle species, the loggerhead and ridley sea turtles are relatively common in the nearshore waters of the Gulf of Mexico where they forage, and may occur within the actual project area. Juvenile and sub-adult Kemp's ridley turtles occupy shallow coastal waters where crabs are abundant and where substrates consist of sand or mud. Small turtles are generally found nearshore from May through October. Adults and juveniles move offshore to deeper warmer water during the winter.

There are five endangered species of whales that occur in the Gulf of Mexico. They include the finback (*Balaenoptera physalus*), humpback (*Megaptera novaeangliae*), right (*Eubalaena glacialis*), sei (*Balaenoptera borealis*) and sperm (*Physeter catodon*) whales. Due to the extreme shallow waters within the project area, none of these species would likely occur.

Future With and Without Project

Future Without Project (FWOP) - Williams et al. (1992) estimated the shoreline recession rates of Raccoon Island to be among the highest in the world. From 1887 to 1988, shoreline retreat rates were estimated to be 24 ft/yr. However, evidence suggests that the retreat rate has increased over time, with a retreat rate of 21 ft/yr between 1887 and 1956, increasing to 29 ft/yr between 1956 and 1988. The recently completed sediment budget report by Coastal Planning and Engineering (CP&E 2004) estimated that the current shoreline retreat rate is 54 feet/year in the area west of the existing breakwaters.

Continued degradation of the island will directly affect wildlife populations in the project area in an adverse manner. The decline in productivity of the area for many species of wildlife, primarily nesting colonial waterbirds, will likely continue until all emergent marsh and beach has been lost. The loss of Raccoon Island will mean the loss of one of the most important breeding areas for brown pelicans, roseate spoonbills and reddish egrets in the state, primarily due to its seclusion, lack of predators and human disturbance, and availability of nesting habitat (Vermillion, 2003, personal communication). Continued deterioration of woody shrubs and beach habitat will also result in the loss of this important resting and refueling area for migratory neotropical species as well as migrating shorebirds. As emergent marsh is lost through conversion to open water, fisheries populations may show a short-term increase due to the introduction of detrital material and the resulting increase in the food web base. Fisheries production will then decline dramatically as the remaining marsh estuary is completely converted to open gulf. Once the island is lost, the current importance of the area to sport fishing will be substantially reduced.

FWOP at the current loss rate is estimated to be equivalent to 105 acres by target year (TY) 20. Because there is currently only 58 acres in the project area, the loss at TY 20 is projected to be all of the existing 58 acres. Additionally, the FWOP loss estimate on the eastern end of the island where the eastern groin is proposed is an additional 4 acres by TY 20.

Therefore the FWOP alternative would result in continued degradation and ultimately complete loss of emergent wetlands and will have a direct adverse effect on the feeding and nesting habitat of the (E) brown pelican in the project area. It would also adversely affect the migrating (T) piping plover with loss of habitat.

Future With Project (FWP) – Construction of the additional breakwaters and western groin are planned to offset the high rate of shoreline retreat and land loss. It is estimated that the FWP would reduce the projected loss rate by 78% from 54 ft/yr to 12 ft/yr in the project area (CP&E 2004), which would result in a loss of 23 acres by TY 20. Additionally, according to the CP&E Report (2004), accretion is expected to occur in the breakwater field and it is estimated that approximately 50% or 12 acres of this area will fill in for a net loss of only 11 acres by TY 20.

Construction of the eastern groin is necessary to offset erosion rates behind breakwaters 0 and 1, which is currently estimated to be 69 ft/yr (CP&E 2004). FWP (eastern groin) at TY 20 would protect the four acres projected for loss in FWOP plus build 6 additional acres (CP&E 2004).

The Phase B, or marsh creation, portion of the project involves creating over 60 acres of barrier island habitat in the back bay area as a northward extension of the current island. Structural features include building a retention dike between two peninsulas to enclose a large open water cove area, then backfilling the area with hydraulically dredged material. Non-structural features involve planting the newly created dune and supratidal areas with woody and herbaceous plant species to compliment existing island habitat. Such created wetlands should significantly enhance critical habitat for brown pelicans and various species of colonial waterbirds along with extending the projected existence of the island itself.

With the implementation of this project, it is anticipated that the loss of emergent marsh would be reduced, thus, the project area will continue to provide suitable habitat for a wide range of fish and wildlife species. Construction of eight additional breakwaters on the western gulf side of the island is anticipated to re-establish intertidal areas from the existing beach gulfward to the breakwaters, much as the existing breakwaters have accomplished in the past. These areas beyond the breakwaters have been the most utilized for colonial seabird nesting. The breakwaters will also protect the island from constant erosional forces, especially during hurricane and tropical storm events and help to protect the existing habitat.

Increasing the subaerial habitat by more than 60 acres through marsh and dune creation on the bayside is anticipated to have a positive impact on nesting colonial waterbird use as well as that of migrating neotropical and shorebird species. Portions of the created subaerial habitat are anticipated to become vegetated by shrubby species. Protection and probable creation of woody habitat will insure the availability of important neotropical habitat, which is important during both spring and fall migration, and colonial waterbird nesting habitat. Estuarine fishery dependent species should greatly benefit with the increase in intertidal area and tidal creeks from the marsh creation. Shallow areas of the back bay will be partially filled and marsh creation will be designed to allow for fish access. Depending on the fill material that is pumped into this area, this could also increase beach habitat on the back bay vegetated portion of the island. Constructed breakwaters will also provide unique habitat for additional fisheries species while providing additional sport fishing sites.

Some short-term adverse effects can be expected in areas adjacent to construction sites on very slow-moving and sedentary organisms. However, no adverse long-term effects are

expected and conditions should again be suitable for fish and wildlife production shortly after construction is complete. All construction activities will be performed in such a way as to minimize effects as much as possible on wildlife and fishery species. Some short-term construction impacts may include temporary, localized increase in turbidity and suspended solids during the construction period and possible periodic disturbance to birds resting and feeding on the island by the sounds and movement of construction equipment. No disruption of nesting is expected since construction will take place during non-nesting periods and according to USFWS guidelines. Access for aquatic organisms may be limited by certain structural measures planned in some areas for a limited amount of time, but should not be detrimental to the population as a whole due to numerous connections with other nearby areas of suitable habitat.

Coordination with USFWS will be conducted prior to project implementation in order to assure no adverse impacts occur to threatened or endangered species within the project area during construction. Construction will be done within the guidelines set forth by the USFWS to insure protection of critical habitat necessary for the brown pelican and piping plover. For example, guidance will be sought on the timing of the project so as to minimize disturbance to nesting birds and distance from sensitive areas to minimize the potential for damage to important nesting sites. The overall effect of the project will be to protect and increase the resources that currently support the largest nesting colony of brown pelicans in the state. Proposed project activities are not anticipated to affect any endangered or threatened species in any way.

Conclusion

NRCS has determined that the Raccoon Island Shore Protection/Marsh Creation project (TE-48) is not likely to adversely affect any threatened or endangered species in the Project area. While minimal disturbance may occur during construction, the project will ultimately increase the habitat available to (E) brown pelicans, (T) piping plovers, and other migratory waterbirds that inhabit the island.

Literature Cited

- Hess, Tom. 2004. Personal communication. Louisiana Department of Wildlife and Fisheries.
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- Vermillion, William. 2003. Personal communication. U.S. Fish and Wildlife Service.
- Williams, S.J., S. Penland, and A.H. Sallenger, Jr. 1992. Louisiana Barrier Island Erosion Study. Atlas of Barrier Shoreline Changes in Louisiana from 1853-1989. U.S. Geological Survey.



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.

Suite 400

Lafayette, Louisiana 70506

September 8, 2004

Mr. Ron Boustany
Natural Resources Specialist
Natural Resources Conservation Service
646 Cajundome Boulevard, Suite 180
Lafayette, Louisiana 70506

Dear Mr. Boustany:

Please reference your August 11, 2004, letter requesting our concurrence with the Natural Resources Conservation Service's (NRCS) determination that the proposed Raccoon Island Shore Protection/Marsh Creation Project is not likely to adversely affect the endangered brown pelican (*Pelecanus occidentalis*), the piping plover (*Charadrius melodus*), or its designated critical habitat. Authorized by the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA), the proposed project would involve installing eight segmented breakwaters and a terminal groin along the Gulf shoreline on the eastern end of the island (Phase A), and creating over 60 acres of dune, supratidal and intertidal habitat by depositing dredged material on the bayside of the island (Phase B), in Terrebonne Parish, Louisiana. The U.S. Fish and Wildlife Service (Service) has reviewed the information you provided, and offers the following comments in accordance with provisions of the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

As you know, brown pelicans are currently known to nest on Raccoon Island. In spring and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

The piping plover, as well as its designated critical habitat, also occur on Raccoon Island. Piping plovers winter in Louisiana, and may be present for 8 to 10 months. They arrive from the breeding grounds as early as late July and remain until late March or April. Piping plovers feed extensively on intertidal beaches, mudflats, sandflats, algal flats, and wash-over passes with no or very sparse emergent vegetation; they also require unvegetated or sparsely vegetated areas for roosting. Roosting areas may have debris, detritus, or micro-topographic relief offering refuge to plovers from high winds and cold weather. In most areas, wintering piping plovers are dependent on a mosaic of sites distributed throughout the landscape, because the suitability of a particular site for foraging or roosting is dependant on local weather and tidal conditions; thus, plovers may move among sites as environmental conditions change. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

Piping plover designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plover wintering habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support those habitat components. Constituent elements are found in geologically dynamic coastal areas that contain intertidal beaches and flats (between annual low tide and annual high tide), and associated dune systems and flats above annual high tide. Important components (or primary constituent elements) of intertidal flats include sand and/or mud flats with no or very sparse emergent vegetation. Adjacent unvegetated or sparsely vegetated sand, mud, or algal flats above high tide are also important, especially for roosting plovers. On Raccoon Island, designated critical habitat "... includes the entire island where primary constituent elements occur to the MLLW [mean low low water]" (66 FR, No. 132, Page 36127).

According to your letter, the short-term effects during construction of the terminal groin and breakwaters (Phase A) may include a temporary localized increase in turbidity and suspended solids, and periodic noise disturbance to any birds (e.g., brown pelicans and/or piping plovers) loafing or roosting on the island and/or foraging within the project area. Access to aquatic prey organisms may also be temporarily limited by certain structural measures in the immediate project area; however, bird populations (i.e., brown pelicans and/or piping plovers) should not be significantly affected due to the abundance of nearby suitable habitat. Likewise, the short-term effects from creating over 60 acres of dune, supratidal and intertidal habitat by depositing dredged material on the bayside of the island (Phase B) would result in similar effects to those species. Furthermore, NRCS does not expect disruptions to nesting brown pelicans because construction would be conducted during the non-nesting period (i.e., September 15 to March 31) and in accordance with the Louisiana Department of Wildlife and Fisheries' (LDWF) regulations for the Isles Dernieres Barrier Islands Refuge.

Based on your letter, short-term effects during construction of Phases A and B may temporarily disturb existing designated piping plover critical habitat by increasing turbidity and suspended solids; however, no heavy machinery would be necessary on the beach. In the long-term, NRCS anticipates that construction of the terminal groin and additional breakwaters (Phase A) would offset the high rate of shoreline retreat and land loss on the Gulf-side of Raccoon Island. The Gulf-side erosion rate of 54 feet per year would be reduced to 21 feet per year. Construction of the terminal groin on the eastern end of the existing breakwaters is necessary to offset erosion rates behind those breakwaters. That project feature would protect approximately 4 acres projected for loss and accrete approximately 6 acres. Accretion is also expected to occur in the breakwater field, and approximately 12 acres of this area would be filled with sediment captured by the eight additional breakwaters. Construction of the additional breakwaters is expected to re-establish intertidal areas between the existing beach and those new breakwaters (similar to the accretion associated with the existing breakwaters). The breakwaters would also protect the island from constant erosional forces, especially during hurricanes and storm events, and would protect existing habitat.

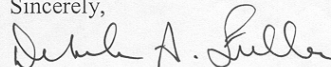
Although the proposed breakwaters would decrease sediment transport to the western end of the island (i.e., sand spit), erosion rates would be significantly reduced from 54 feet per year to 21 feet per year immediately behind the proposed breakwaters. That area is used extensively by nesting brown pelicans. In addition, the reduction in sediment transport to the sand spit would be offset by the creation of beach and other intertidal habitats on the eastern end of the island near

the terminal groin and between the proposed breakwaters and shoreline. Because the sand spit on the western end of the island is ephemeral, NRCS anticipates that the sand spit will continue its current "grow-and-recede" pattern, with or without the proposed action. In addition, NRCS expects that creation of additional dune, supratidal and intertidal habitat on the bayside of the island (Phase B) would help to further stabilize the existing habitat and any new habitat created by the additional breakwaters. Overall, the NRCS believes that the proposed project would protect and increase existing nesting and foraging habitat for the brown pelican and piping plover, respectively.

Based on the above information, the Service concurs with the NRCS' determination that the proposed action is not likely to adversely affect the brown pelican, the piping plover, or its designated critical habitat. Therefore, no further ESA consultation with the Service would be required for the proposed action unless there are changes in the scope or location of the project elements, or the project has not been initiated within one year. If the proposed action has not been initiated within one year, follow-up consultation should be accomplished with the Service prior to making expenditures to ensure that the threatened and endangered species information is up-to-date. If the scope or location of the proposed action is changed, consultation should occur as soon as such changes are made.

We appreciate the NRCS' continued cooperation in the conservation of endangered and threatened species, and their critical habitat. If you have any questions or require additional information, please contact Brigette Firmin (337/291-3108) of this office.

Sincerely,



Deborah A. Fuller
Acting Supervisor
Louisiana Field Office

cc: FWS, Panama City, FL (Attn: Patty Kelly)
Corps of Engineers, New Orleans, LA
NMFS, Baton Rouge, LA
LDNR, CMD, Baton Rouge, LA
LDNR, CRD, Baton Rouge, LA
LDWF, New Iberia, LA (Attn: Greg Linscombe)
LDWF, Natural Heritage Program, Baton Rouge, LA

Appendix F – Comments and Responses Concerning the Draft EA

The following pages document the comments on the Draft EA that were received from federal and state agencies, and the response to those comments by the NRCS. Comments are summarized and, with responses, are grouped by agency. Page numbers used in individual agency comments refer to the Draft EA. Page numbers used in NRCS's response to those comments refer to the present document. Copies of agency letters are provided at the end of this Appendix.

**UNITED STATES DEPARTMENT OF THE INTERIOR,
Fish and Wildlife Service**

GENERAL COMMENTS:

- Comment: In accordance with the consultation requirements of the Endangered Species Act, the Service has concurred with your determination that the proposed project is “not likely to adversely affect” the endangered brown pelican or the threatened piping plover and its critical habitat.
- Response: The NRCS letter of request, dated August 11, 2004, and letter of concurrence by USFWS, dated September 8, 2004, have been included in Appendix E.

SPECIFIC COMMENTS:

- Comment: Page ii, Project Setting, Distribution of Soil Types - The word "find" should be changed to "fine."
- Response: Text has been revised accordingly.
- Comment: Page 1, Resource Information, Size of Project - It is indicated that the project area is 274 acres. In contrast, a recent evaluation of project benefits (i.e., breakwaters and groin only) by the CWPPRA Environmental Work Group indicates that the project area is 502 acres which encompasses all emergent and subtidal habitats associated with Raccoon Island. However, that evaluation may not have encompassed all of the area impacted by the marsh creation component (Phase B) of this project. A revised project-area acreage should be calculated and included in the final EA.
- Response: The project area acreage value has been revised to reflect the entire area encompassed by all project features.
- Comment: Page 2, Project Benefits, Primary - This section indicates that 85 acres of habitat would be protected and 82 acres would be created by the project. However, the recent evaluation of project benefits (i.e., breakwaters and groin only) by the CWPPRA Environmental Work Group indicated that only 16 acres of habitat would be protected. In addition, the draft EA indicates that only 60 acres of habitat would be created. We recommend that project benefits be displayed in the final EA as determined by the CWPPRA Environmental Work Group.
- Response: The acreage values have been revised to reflect the final numbers determined by the CWPPRA Environmental Work Group.
- Comment: Page 4, Paragraph 1 - The project-area acreage of 274 should be corrected as previously mentioned.
- Response: Text has been revised accordingly.
- Comment: Page 4, Paragraph 7 – The word “find” should be changed to “fine.”
- Response: Text has been revised accordingly.

- Comment: Page 8, Figure 3 – This figure should be revised for the final EA to include the project boundary as evaluated by the CWPPRA Environmental Work Group. Areas behind the existing breakwaters should also be included.
- Response: Text has been revised to indicate that the figure used is an example of habitat and land/water acreage changes that have occurred over the recent past. An updated habitat map of this kind has not been produced and the acreages used in the WVA were not derived from these maps.
- Comment: Page 11, Last paragraph – Project impacts to threatened or endangered species should be discussed in the Environmental Effects and Comparison of Alternatives section on page 18 under the heading “Threatened and Endangered Species.”
- Response: Text has been added to the “Threatened and Endangered Species” section under **Environmental Effects and Comparison of Alternatives** to address this comment.
- Comment: Page 12, Paragraph 1 – This section indicates that seagrass (i.e., submerged aquatic vegetation) is one of the Essential Fish Habitat types found within the project area. This reference conflicts with page 9, which indicates that no submerged aquatic vegetation is found within the project area. We recommend that this discrepancy be resolved in the final EA.
- Response: The referred to text has been deleted.
- Comment: Page 12, Migratory Birds – This section should discuss migratory bird species and their use of Raccoon Island. Executive Order 13186 should be discussed on page 24 with other Executive Orders.
- Response: Text has been added to the “Migratory Birds” section under **Fish and Wildlife Resources** to address this comment.
- Comment: Page 16, Paragraph 2 – Reference to Appendix E should be changed to Appendix D.
- Response: Text has been revised accordingly.
- Comment: Page 16, Paragraph 3 – It is indicated that nearly 100 acres of barrier island habitat would be lost over the next 20 years under future without-project conditions. We recommend this paragraph be revised to conform to the most recent evaluation of future without-project conditions by the CWPPRA Environmental Work Group, which indicates that 62 acres of barrier island habitat would be lost under future without-project conditions.
- Response: Text has been updated to reflect the latest assessment conducted by the CWPPRA Environmental Work Group.
- Comment: Page 16, Paragraph 4 – It is indicated that approximately 108 acres of subaerial habitat would be created under future with-project conditions. In contrast, the most recent evaluation of future with-project conditions by the CWPPRA Environmental Work Group indicates that only 18 acres of barrier

island habitat would be created by Phase A project features, and the draft EA indicates that only 60 acres would be created under Phase B. The final EA should be revised to correct this discrepancy.

In addition, this section should discuss any adverse impacts (i.e., downdrift erosional impacts to the spit) which might result from project implementation. Those impacts have also been addressed in the wetland benefits assessment conducted by the CWPPRA Environmental Work Group.

Response: Text has been updated to reflect the latest assessment conducted by the CWPPRA Environmental Work Group.

Text has been added as a last paragraph to the “*Emergent and Submerged Aquatic Vegetation*” section under **Environmental Effects and Comparison of Alternatives** and in several other areas of the document to address the subject of downdrift erosional impacts.

Comment: Page 18, Paragraph 3 – Appendix E does not include any information regarding construction guidelines as set forth by the Service or the Louisiana Department of Wildlife and Fisheries; however, we recommend that information be included in the final EA.

Response: The referred to guidelines are included in the Final EA.

Comment: Any reference to critical habitat should only be made in association with the threatened piping plover, not the endangered brown pelican for which critical habitat has not been designated.

Response: Text in the document has been revised to comply with the noted comment.

Comment: As previously indicated, the Service has concurred with your determination that the proposed project is “not likely to adversely affect” the endangered brown pelican or the threatened piping plover and its critical habitat. However, this section should be revised to include the rationale for that determination and indicate that Section 7 consultation with the Service was conducted. A copy of the Service’s September 8, 2004, concurrence letter should be included in an appendix.

Response: Text has been revised as requested and a copy of FWS’s concurrence letter has been included in the EA in Appendix E.

**UNITED STATES DEPARTMENT OF COMMERCE,
National Oceanic and Atmospheric Administration,
National Marine Fisheries Service**

GENERAL COMMENTS:

Comment: The NMFS is concerned with the inclusion of marsh creation as part of the proposed action because details regarding the creation area and the borrow source are not included in the draft EA, nor has that component been funded for construction. The NMFS recommends the marsh creation component be deleted from the proposed action and addressed in a supplemental EA when adequate design detail (e.g., geotechnical report, plan and section views,

acreage, analysis of the effects of borrow area excavation on wave climate, etc.) is available for review. Provided that the marsh creation component has been neither authorized nor funded, we recommend the draft EA be revised to fully evaluate the potential impacts associated with construction of the proposed breakwaters only.

Response: NRCS considers the marsh creation component (Phase B) critical to the overall success of the TE-48 Project and, as such, has consulted with NMFS concerning the inclusion of this phase in the EA. It was agreed that when more specific and appropriate design detail becomes available as a result of ongoing geotechnical investigations, a supplement to this EA further detailing potential impacts of Phase B components will be provided.

The Phase A (shoreline protection) portion of this project was granted Phase 2 approval by the CWPPRA Task Force on October 13, 2004. However, authorization for Phase 2 funding for Phase B is pending and requires Technical Committee concurrence and Task Force approval. Because Phase 2 approval for Phase B has not yet been obtained, NRCS has included an additional alternative (Alternative 2) in the EA that addresses a Shoreline Protection-only situation.

Comment: The NMFS is concerned that project implementation, as described in the draft EA, would adversely impact the sand spit which presently extends westward from the proposed site of the breakwaters. As evaluated in the June 2004 Raccoon Island Sediment Budget Report prepared by Coastal Planning and Engineering, Inc. (CPE), installation of the breakwaters is expected to reduce the westward movement of sand by approximately 16,000 cubic yards annually (i.e., 59% annual reduction). The existing sediment budget contributes to the maintenance of the sand spit. Therefore, reducing the movement of sediment to the spit is expected to adversely impact sedimentation rates and could lead to accelerated erosion of the spit. While this spit is primarily unvegetated due to its low elevation, it serves as Essential Fish Habitat (EFH) for various life stages of Spanish mackerel, bluefish, red drum, brown shrimp, and white shrimp.

Response: The objective of conducting a sediment budget for the project was to enable the prediction of shoreline response to NRCS's proposed breakwater field and recommend alternatives that could improve the effectiveness of the breakwaters. The report did not evaluate, comment on, or predict implications that the proposed breakwaters could have on the adjoining spit area. The decrease in sediment transport cited by NMFS (16,000 cy/yr) and as estimated in the Sediment Budget Report by CP&E, is a calculated value based on uncertain conditions, such as the assumption that there will be no onshore movement of sediment. A further review of the report indicates that the predicted rate is to occur at the terminal end of the proposed breakwater field. Beyond that point, the littoral transport rate is expected to increase uniformly until or to station 100+00 (approx. 1600' west of breakwater 15) where the predicted rate matches with the pre-construction rate (i.e. no losses due to structures).

Regardless, LDWF and NRCS recognize that possible negative impacts could result from the proposed action and proposes to incorporate into the project's Monitoring Plan additional bathymetric and topographic surveys of the entire spit. If analysis of the surveys yields that significant negative down drift

impacts to the down-water field (spit) are occurring as a result of project implementation, then action to compensate for a projected 20 year loss will be incorporated in the Phase B construction portion of the project. Such action will involve the placement of material at a location and quantity recommended by a professional(s) with knowledge and experience in this field of science. The intent of placing such material will be to maintain the integrity of the spit and not to improve the functionality of the breakwaters. With this proposal in mind, NRCS would like to acknowledge that the area behind the breakwaters should become shallower and allow for mitigative replacement of some EFH in the case that any is lost on the currently ephemeral spit. Project components proposed for Phase B will also serve as mitigative replacement for EFH losses.

Comment: The NMFS also believes that there are less damaging alternatives to the proposed action. Specifically, sand introduction should be considered as a method to minimize the adverse effects to longshore transport which are anticipated to result from the proposed breakwaters, as recommended in the CP&E report. Because the National Environmental Policy Act (NEPA) requires the consideration of less damaging alternatives, the NMFS recommends the document be revised to include evaluation of alternatives which involve nearshore sand placement to offset potential adverse impacts associated with breakwater construction. Although such alternatives may not be selected as the preferred alternative due to funding or authorization constraints, consideration of less damaging alternatives in this document is clearly required by NEPA.

Response: Historic photograph analysis of Raccoon Island clearly indicates that the current western shoal (i.e. spit area) has been ephemeral in nature since the disappearance of the emergent land mass that once occupied the shoal. There are scientific predictions that the shoal will completely disappear in time and others contend, at best, the shoal will remain as long as an adjoining, eroding emergent landmass exist to the east. According to CP&E personnel, the reported temporal and spatial effects of the proposed breakwaters are speculative and based on several assumptions and uncertainties. NRCS does not consider sand introduction as a less damaging alternative at this time considering there are no other land masses to be impacted west of Raccoon Island, the uncertainty of the spit's long term existence, and the questionable downstream effects of the breakwaters. However, so as to not disregard the issue of adverse impacts to the spit, NRCS and DNR have dropped from consideration the inclusion of a western groin as proposed in CP&E's Sediment Budget report and are proposing to increase post-construction survey monitoring of the spit area. Mitigative measures, such as near-shore sand placement, will be considered in Phase B construction should significant adverse impacts result from breakwater construction.

SPECIFIC COMMENTS:

Comment: PROJECT SETTING / Geologic Setting, Page 4. This section of the document should be revised to provide an overview of coastal processes which may be affected by the proposed project. Specifically, we recommend that the EA be revised to include information regarding sediment transport dynamics. Additionally, appropriate sections should be added to the EA to

analyze the potential effects of the various alternatives on those coastal processes.

Response: Text has been added to provide an overview of coastal processes as they relate to the sediment dynamics of the island. Because of the complexity of coastal geomorphological processes and the fact that NRCS considers detail on this subject outside the scope of this EA document, two major recent studies (Stone et al. 2003 and Thomson et al. 2004) were referenced for detailed information on the sediment transport dynamics of the island.

Comment: PROJECT SETTING / Emergent and Submerged Aquatic Vegetation Pages 7-8. There is no submerged aquatic vegetation (SAV) present on Raccoon Island at the present, and none is expected to occur in the future with, or without, project implementation. As such, we recommend all references to SAV be deleted from the document and this section be titled "Emergent Vegetation".

Response: NRCS recognizes that SAV is not currently present within the project area, however due to the marine/aquatic environment of the area, the potential for SAV occurrence does exist.

Comment: PROJECT SETTING / Fish and Wildlife Resources / *Essential Fish Habitat* Page 12, paragraph 1. The Magnuson-Stevens Fishery Conservation and Management Act was misspelled in the first sentence. This should be corrected. In addition, SAV is identified as a category of EFH potentially found in the project area. According to the draft EA, no SAV is present in the project area. As stated previously, we recommend all mention of SAV be deleted from the document.

Also, two federally managed species were omitted from this paragraph. The Gulf of Mexico Fishery Management Council has designated EFH in the project area for Spanish mackerel and bluefish in addition to brown shrimp, white shrimp and red drum. The following species, life stages and categories of EFH should be added to those identified in this paragraph:

<u>Species</u>	<u>Life Stage</u>	<u>EFH</u>
Spanish mackerel	juveniles	beach, estuaries
bluefish	postlarvae/juveniles adults	beaches, estuaries, inlets estuaries

Response: Text has been revised and added accordingly.

Comment: FORMULATION, DESCRIPTION AND COMPARISON OF ALTERNATIVES / Description of Alternatives Page 15. Only two alternatives are provided in this section of the document: the no action alternative and the proposed action, which includes only the construction of the breakwaters and marsh creation on the north side of the island. As stated above, the NMFS recommends the placement of sand, either within the breakwater field, as recommended in the CPE Report, or as a feeder berm just to the west of the breakwaters, be evaluated as a plan component. Lacking such an evaluation, the document does not adequately address potential project impacts to resources of concern and is not in compliance with NEPA.

Response: NRCS agrees with the concept of sand placement to offset the adverse impacts “to the spit area” resulting from breakwater construction. However, since such impacts are questionable and uncertain at this time and the quantity, quality, and preferable placement (design issues similar to Phase B) is unknown, NRCS considers it more appropriate to address this issue in the Phase B Supplement to the EA than include such an alternative in this EA.

Comment: FORMULATION, DESCRIPTION AND COMPARISON OF ALTERNATIVES / Environmental Effects and Comparison of Alternatives / *Fish and Wildlife Habitat* / Alternative 2.
Page 17, paragraph 4. The CPE Report indicated that construction of the breakwaters is expected to reduce the westward flow of sediment to the spit. This would lead to accelerated erosion of the spit. That spit serves as feeding and resting habitat for numerous fish and wildlife species. While we agree that the overall project would improve the net conditions for most fishery species that use Raccoon Island, the document should be revised to include information regarding potential impacts to fishery species that utilize barrier island sand flats and surf zone habitats (e.g., gulf menhaden, white and striped mullet, red drum, lesser blue crab, spot, pompano and anchovies)

Response: Language as advised in the comment has been inserted accordingly.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 6

GENERAL COMMENTS:

Comment: We would recommend that a discussion of such potential indirect impacts be included under “Environmental Effects and Comparison of Alternatives” and then referenced again in the section entitled “Risk and Uncertainty”.

Response: Text has been included in the referred sections to address potential impacts of the proposed work.

Comment: Accordingly, we would recommend that NRCS maintain the reference to marsh creation in the subject EA, while committing to prepare a supplemental EA when there is more specific information available on both the details of the marsh creation project and its potential environmental effects.

Response: Reference to Phase B (marsh creation) will remain in the document and NRCS will prepare a supplemental EA when more specific and appropriate design detail becomes available.

SPECIFIC COMMENTS:

Comment: Include a third alternative, involving sediment placement and plantings, but no hard structures;

Response: Raccoon Island is the only barrier island in the Isle Dernieres chain with fairly extensive wooded habitat still remaining. Recognizing the importance of and need to preserve such habitat, various options to protect and sustain the island were considered in the planning stages of this project. In 1994, post

Hurricane Andrew, LDWF placed approximately 1 million cubic yards of dredged material both onshore and nearshore in breached areas along the island. Within 1 year nearly 90% of the nearshore material along the gulf shoreline was lost due to wave erosion leaving critical nesting habitat exposed to the negative impacts of the gulf's edge. The use of external sediments for the island's sustenance and subsistence was therefore considered temporary and very expensive in comparison to rock breakwaters. Furthermore, the replacement of the unique habitat conditions that currently exist on Raccoon Island with vegetative plantings could take several years and would result in the loss of difficult-to-establish bird populations in the interim. As a result, NRCS planners determined that the use of gulfward placement of sediment material was not the most effective alternative in providing protection to the island. On the other hand, sediment placement and vegetative plantings on the bay side of the island has distinct advantages and is considered the alternative of choice for preserving and enhancing that area of the island.

Comment: Discuss the potential adverse impacts of hard structures, in terms of erosional shadows and future navigation hazards;

Response: Text has been added to the document to address the potential impact the construction of the breakwaters may have on the adjoining western shoal (i.e. spit area). If during the life term of this project, the breakwaters become a navigational hazard as classified by the U.S. Coast Guard, remedial measures shall be taken to remove the breakwaters as part of the Operation & Maintenance phase of this project. Text has been added to the Risk and Uncertainty section of the EA regarding this issue.

Comment: Include a commitment to develop a supplemental EA for the proposed marsh creation component, if and when NRCS is prepared to proceed with this part of the projects;

Response: NRCS has agreed to such commitment.