

# FINAL DAMAGE ASSESSMENT AND RESTORATION PLAN/ENVIRONMENTAL ASSESSMENT

for the April 5, 2001, Natural Gas Condensate Discharge in Mosquito Bay on Point Au Fer Island, Terrebonne Parish, Louisiana



**October 2005**

National Oceanic and Atmospheric Administration  
U. S. Fish and Wildlife Service  
Louisiana Oil Spill Coordinator's Office, Office of the Governor  
Louisiana Department of Natural Resources  
Louisiana Department of Wildlife and Fisheries  
Louisiana Department of Environmental Quality

## **Executive Summary:**

On April 5, 2001, a pipeline owned by Transcontinental Gas Pipe Line Corporation and operated by Williams Field Services Group, Inc., discharged natural gas condensate into the environment near Mosquito Bay, Terrebonne Parish, Louisiana. Between 1,000 and 3,000 barrels of natural gas condensate were discharged from the pipeline. The responsible party and its spill response contractor initiated containment and cleanup after the discharge. Physical recovery and a controlled burn were used to remove natural gas condensate from the environment. A natural resource damage assessment was performed to determine the nature and extent of injuries to natural resources and services and identify restoration alternatives to compensate the public for those injuries.

The natural resource trustees for this incident include two federal and four state agencies: the National Oceanic and Atmospheric Administration; U.S. Department of the Interior, represented by the U.S. Fish and Wildlife Service; Louisiana Oil Spill Coordinator's Office, Office of the Governor; Louisiana Department of Natural Resources; Louisiana Department of Environmental Quality; and Louisiana Department of Wildlife and Fisheries (collectively, the Trustees). These agencies share responsibility for trust resources and services and their supporting ecosystems belonging to, managed by, controlled by, or appertaining to the State of Louisiana.

## **Final Plan to Restore Natural Resources:**

The natural resources and services affected by the incident and restoration alternative selected by the Trustees are described in this Final Damage Assessment and Restoration Plan/Environmental Assessment (Final DARP/EA). This Final DARP/EA was developed cooperatively among state and federal Trustees, and the responsible party.

## **What was injured?**

The total area affected by the incident was 106.0 acres. 12.7 acres of marsh sediments and vegetation were directly affected by natural gas condensate and a controlled burn. An additional 93.3 acres were not affected by natural gas condensate, but were affected by the controlled burn after the fire escaped its planned boundaries and burned the marsh vegetation.

## **How was the restoration alternative selected?**

The Trustees considered various alternatives to compensate the public for lost resources and services. Each alternative was evaluated using six criteria before a restoration alternative was selected. The criteria were:

- Cost to carry out the alternative;
- Extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;

- Likelihood of success of each alternative;
- Extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative;
- Extent to which each alternative benefits more than one natural resource and/or service; and
- Effect of each alternative on public health and safety.

### **What is the selected restoration alternative?**

After identifying 23 restoration alternatives exhibiting a sufficient nexus to the injured habitat, and within the same watershed, the Trustees considered 14 with a strong nexus to the injured resource (*i.e.*, brackish marsh) to compensate for injuries to natural resources and services. A dredge and fill marsh creation project was the selected restoration alternative for restoring natural resources and services. Marshes created with this technique have successfully provided service to natural resources in a cost effective manner. Dredge and fill marsh creation projects also have a high likelihood of success.

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## CHAPTER 1: INTRODUCTION

This Final Damage Assessment and Restoration Plan/Environmental Assessment (Final DARP/EA) was prepared by federal and state natural resource Trustees (identified below) to inform the public about injury assessment and restoration planning conducted after natural gas condensate<sup>1</sup> was discharged into the environment near Mosquito Bay, Terrebonne Parish, Louisiana. The pipeline involved in the incident was owned by Transcontinental Gas Pipe Line Corporation (Transco) and operated by William Field Services Group, Inc. (Williams). Under the federal Oil Pollution Act of 1990 (OPA), Williams was the Responsible Party (RP) liable for natural resource damages (*i.e.*, the costs of conducting the natural resource damage assessment and the restoration costs). Transco (now the RP) continues to own and now operates the pipeline, has been cooperating with the Trustees, and is taking responsibility for the costs of conducting a natural resource damage assessment, as well as the costs of implementing the Trustees' selected restoration alternative identified in this Final DARP/EA.

The purpose of restoration is to make the environment and the public whole for injuries resulting from the incident. Restoration alternatives that return injured trust resources and services to baseline<sup>2</sup> and compensate the public for interim losses are required under OPA. This requirement is achieved through restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and/or services (33 U.S.C. §2706(b)). Thus, this Final DARP/EA only considered alternatives with a connection between natural resource and service injuries and restoration alternatives. The Trustees sought comments on the preferred restoration alternative presented in the Draft DARP/EA (July 2005). No comments were received during the 30-day public comment period; therefore, the restoration alternative identified as preferred in the Draft DARP/EA was selected for implementation in this Final DARP/EA. The Trustees will now present the selected restoration alternative to the RP for implementation.

The natural resource Trustees for this incident include two federal and four state agencies: the National Oceanic and Atmospheric Administration (NOAA); U.S. Department of the Interior (USDOI), represented by the U.S. Fish and Wildlife Service (USFWS); Louisiana Oil Spill Coordinator's Office, Office of the Governor (LOSCO); Louisiana Department of Natural Resources (LDNR); Louisiana Department of Environmental Quality (LDEQ); and Louisiana Department of Wildlife and Fisheries (LDWF) (collectively, the Trustees). These agencies share responsibility for trust resources and services and their supporting ecosystems belonging to, managed by, controlled by, or appertaining to the State of Louisiana.

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<sup>1</sup> From 30 CFR sections 206.101 and 206.151, "Condensate" is similarly defined as "liquid hydrocarbons (normally exceeding 40 degrees of API gravity) recovered at the surface without resorting or processing. Condensate is the mixture of liquid hydrocarbons that results from condensation of petroleum hydrocarbons existing initially in a gaseous phase in an underground reservoir". Natural gas also was released during the incident but natural gas is not a substance under the jurisdiction of the natural resource Trustees.

Therefore, only injuries that resulted from the discharge of natural gas condensate were assessed and quantified during the natural resource damage assessment process.

<sup>2</sup> At any point in time, baseline refers to the condition of the natural resources and services that would have existed had the incident not occurred.

## **1.1 INCIDENT SUMMARY**

On April 5, 2001, natural gas and natural gas condensate were discharged near the northern bank of Mosquito Bay, Terrebonne Parish, Louisiana (Figure 1.1). The discharge originated from a 20-inch pipeline that transported natural gas condensate produced from several gas wells, which resulted in a large volume of natural gas condensate flowing through the line. Williams, LOSCO, LDEQ, and the U.S. Coast Guard (USCG) provided estimates of discharge volume that ranged from 1,000 to 3,000 barrels. Brackish marsh vegetation (hereafter referred to as “marsh”), marsh sediments, coastal waters, and fauna inhabiting this area were exposed to natural gas condensate from this discharge. A controlled burn was used during the incident response on April 12 and 13, 2001, to remove natural gas condensate from the environment. The burn affected marsh that was not exposed to natural gas condensate because the fire moved outside of the planned burn area. Additional injury to marsh was caused by heavy equipment used to repair the pipeline. The Trustees and the RP’s consultant conducted several field investigations after the burn to assess marsh recovery. Based on these field investigations, the Trustees delineated the spatial extent of exposure from the discharged material and the severity of effect to natural resources and services. The Trustees concluded that birds, fish, and other fauna, as well as their habitat, were exposed to natural gas condensate. Thus, the Trustees initiated a natural resource damage assessment (NRDA) to determine the nature and extent of injuries to natural resources and services. The RP has been a cooperative participant throughout the NRDA process.

## **1.2 DETERMINATION OF JURISDICTION TO CONDUCT NATURAL RESOURCE DAMAGE ASSESSMENT**

Pursuant to Section 990.41 of the regulations for conducting NRDA under OPA, 15 CFR Part 990 and OSPRA (LAC 43:XXIX.101 *et seq.*), the Trustees determined that legal jurisdiction to pursue restoration under OPA exists for this incident. The oil spill constitutes an "incident" within the meaning of Section 1001(14) of OPA and OSPRA at LAC 43:XXIX.109 - an "occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the discharge or substantial threat of discharge of oil." Because the discharge was not authorized by a permit issued under Federal, State, or local law, and did not originate from a public vessel or from an onshore facility subject to the Trans-Alaska Pipeline Authorization Act, the incident is not an "excluded discharge" within the meaning of OPA Section 1002(c). Finally, natural resources covered by the Trusteeship authority of NOAA and/or Louisiana have been injured as a result of the incident (natural resource injuries are discussed more fully below). These factors established jurisdiction to proceed with an assessment under the OPA and OSPRA NRDA regulations.

### **1.2.1 Determination to Conduct Restoration Planning**

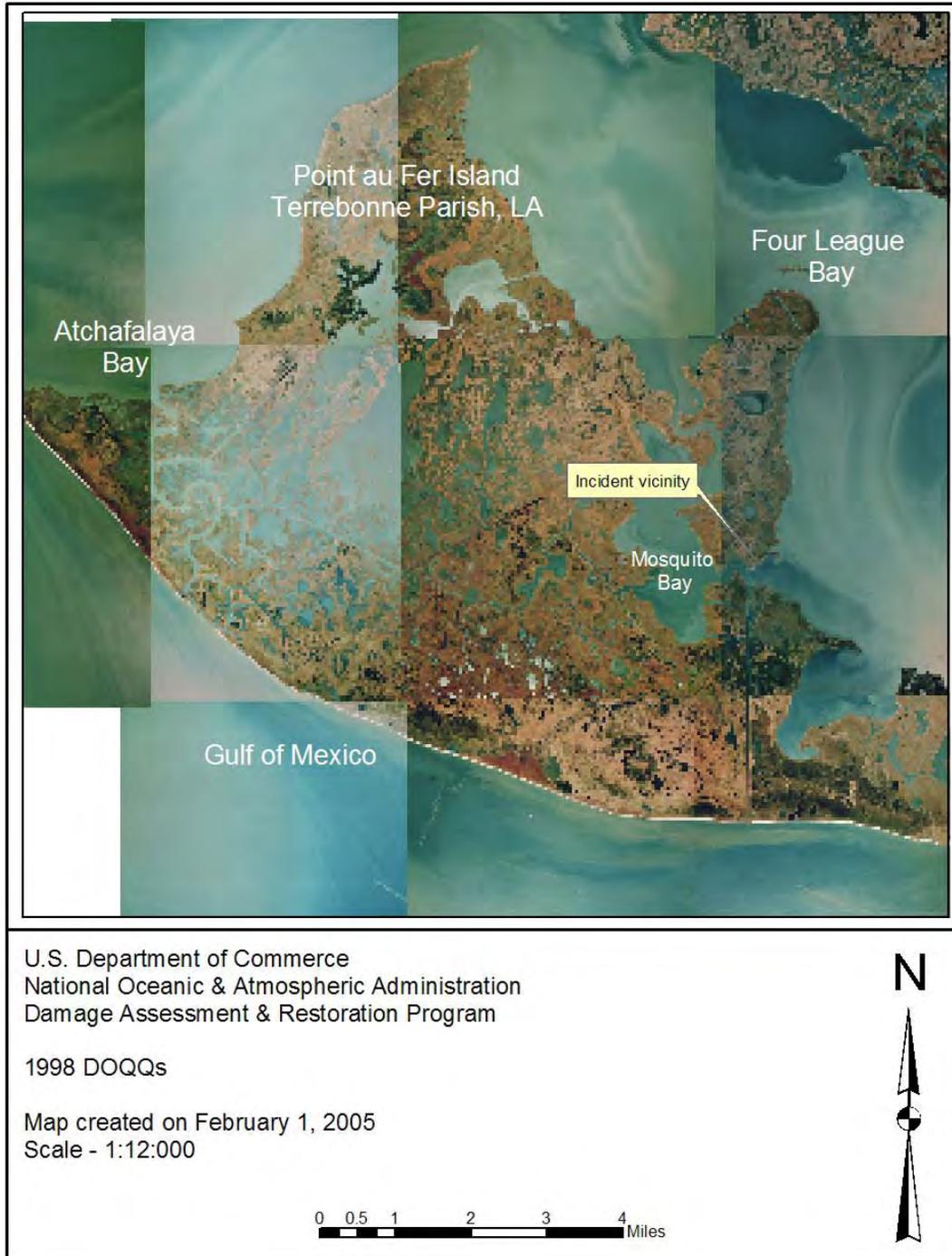
In accordance with 15 CFR Section 990.42 and OSPRA (LAC 43:XXIX.123.), the Trustees for this incident also determined that the requisite conditions existed to justify proceeding with natural resource damage assessment and restoration planning beyond the preassessment phase. These conditions, discussed more fully below, include: existence of natural resource injuries resulting from the discharge or from associated response actions; response actions inadequate or inapplicable to restoration of natural resource injuries and losses; and existence of feasible actions to address the injured resources. Thus, the Trustees acted appropriately in proceeding with the damage assessment and restoration planning process.

### **1.3 SUMMARY OF NATURAL RESOURCE INJURIES**

The discharge of natural gas condensate near Mosquito Bay affected water column and benthic organisms, marsh vegetation, and other species. These resources were also affected by the controlled burn. Mortality to water column and benthic organisms, birds, and other species was not observed during field surveys after the discharge. Some birds, which were thought to have been rails, were killed during the burn. Bird mortality was not quantified because observers would have caused environmental damage by trampling newly-exposed mud flats. Marsh vegetation was affected by the discharge and the controlled burn. The Trustees determined that a total area of 106 acres was injured as a result of the incident: 12.7 acres of marsh habitat were injured by the discharged natural gas condensate, and the controlled burn. The controlled burn also affected an additional 93.3 acres of marsh that was not directly affected by the natural gas condensate discharge. Despite the RP's reasonable effort to minimize damage, some additional injury to the marsh was incurred by heavy equipment used for pipeline repair. Under OPA 1990 (Sec. 1002(b)), injury to natural resources incurred during the response phase of an incident is taken into consideration when assessing natural resource damages.

The total injured area was divided into six sub-areas because the marsh was not equally affected by the natural gas condensate and response actions:

- 1) Area burned during the response, but not directly affected by the natural gas condensate discharge (93.3 acres);
- 2) Area lightly/moderately affected by the natural gas condensate discharge and burned during the response (7.8 acres);
- 3) Area lightly/moderately affected by the natural gas condensate discharge, burned during the response, and was converted to open water (0.9 acres);
- 4) Area heavily affected by the natural gas condensate discharge and burned during the response (3.0 acres);
- 5) Area within 'ground zero' that was heavily affected by the natural gas condensate discharge (0.5 acres) as well as excavation in order to repair the pipeline; and
- 6) Area within 'ground zero' that was heavily affected by the natural gas condensate discharge (0.5 acres) as well as excavation in order to repair the pipeline. The area is not expected to recover.



**Figure 1.1 Vicinity of the natural gas condensate discharge on Point Au Fer Island.**

## **1.4 SUMMARY OF THE SELECTED RESTORATION ALTERNATIVES**

The Trustees' mandate under OPA and OSPRA is to make the environment and the public whole for injuries to natural resources and services resulting from an incident. This requirement must be achieved through the restoration, rehabilitation, replacement, or acquisition of equivalent natural resources and/or services (33 U.S.C. §2706(b) and L.R.S. 30:2451 *et seq.*). Thus, for a project to be considered, there must be a connection between natural resource and service injuries and the proposed restoration action.

Restoration actions under OPA are termed primary or compensatory. Primary restoration is any action taken to accelerate the return of injured natural resources and services to their baseline condition. Trustees may elect to rely on natural recovery rather than primary restoration actions where feasible or cost-effective primary restoration actions are not available, or where the injured natural resources and services would recover relatively quickly without human intervention.

Compensatory restoration is any action taken to compensate for interim losses of natural resources and services pending recovery. The scale of the required compensatory restoration depends on the extent and severity of the initial natural resource and/or service injury and how quickly each natural resource and associated service returns to baseline. Primary restoration actions that speed natural resource and service recovery will reduce the requirement for compensatory restoration.

Based on observations made during the injury assessment phase, the Trustees determined that active primary restoration would not significantly speed the recovery to baseline levels. Therefore, the natural recovery alternative is selected for primary restoration. The Trustees evaluated various restoration alternatives for compensatory restoration and identified 14 with a strong nexus to the injured resource. Based on analysis by the Trustees, a dredge and fill marsh creation project was selected as the compensatory restoration alternative for restoring natural resources and services. Further discussion of selection criteria and the restoration alternatives considered follows in Chapter 5.

## **1.5 PUBLIC COORDINATION**

The Trustees provided information to the public throughout the injury assessment and restoration planning process. On November 20, 2002, the Trustees published a *Notice of Intent to Conduct Restoration Planning* in the Louisiana State Register (Vol. 28, No. 11, pgs. 2452-2453), The Houma Courier, Houma, LA, and The Advocate, Baton Rouge, LA. The public notice stated the Trustees were proceeding with restoration planning under the OPA and opening an Administrative Record (AR) to facilitate public involvement in the restoration planning process (Appendix A). The public can obtain relevant injury assessment reports in the AR, and contact agency personnel to obtain more information.

Public review of the Draft DARP/EA (July 2005) was an integral component of the restoration planning phase. Through the public review process, the Trustees sought

comment on the analyses used to define and quantify natural resource and service injuries and the alternatives proposed to restore injured natural resources and replace lost services. The Draft DARP/EA (July 2005) was made available to the public during a 30-day comment period, that began on July 20, 2005, when a public notice announcing availability of the Draft DARP/EA (July 2005) was issued. Public review of the Draft DARP/EA (July 2005) was consistent with all state and federal laws and regulations that apply to the NRDA process, including Section 1006 of the OPA, the NRDA regulations at 15 C.F.R. Part 990, the National Environmental Policy Act ((NEPA) (42 U.S.C. §§4371 *et seq.*)), and the regulations implementing the NEPA (40 C.F.R. §§1500 *et seq.*).

No comments were received during the public comment period (Appendix B), which ended August 22, 2005.

## **1.6 ADMINISTRATIVE RECORD**

The AR for this incident contains documents relevant to the NRDA process. The AR provides an opportunity for public participation in the restoration planning process and will be available for use in future administrative or judicial review of Trustee actions to the extent provided by federal or state law.

A copy of the AR index from the date of publication of this Final DARP/EA is provided in Appendix A. Additional restoration planning documents and public comments received on the Draft DARP/EA will be included in the AR. Arrangements should be made in advance to review the AR by contacting:

Louisiana Oil Spill Coordinator's Office, Office of the Governor  
Attention: Gina Muhs Saizan  
150 Third Street, Suite 405  
Baton Rouge, LA 70801  
(225) 219-5800  
Monday – Friday  
8:00 am to 5:00 pm Central time zone

## **CHAPTER 2: PURPOSE AND NEED FOR RESTORATION**

This Final DARP/EA has been prepared jointly by the Trustees to identify the selected alternative to restore natural resources and natural resource services injured by the incident. The objective of the selected restoration alternative is to compensate the public for injuries to natural resources and natural resource services resulting from the incident by compensating for interim losses of those resources and services.

### **2.1 AUTHORITIES AND LEGAL REQUIREMENTS**

Each agency has been designated a natural resource trustee under the OPA (33 U.S.C. §2706(b)), OSPRA (L.R.S. 30:2451 *et seq.*), and the National Contingency Plan (40 C.F.R. §§300.600 *et seq.*), for natural resources and services injured by this incident. Each agency, as a designated trustee, is authorized to act on behalf of the public under federal and state law to assess natural resource damages and to plan and implement actions to restore natural resources and services injured or lost as the result of a discharge or substantial threat of a discharge of oil.

#### **2.1.1 OPA and NRDA Overview**

NRDA is described under Section 1006(c) of the OPA (33 U.S.C. § 2706(c)) and OSPRA (L.R.S. 30:2451 *et seq.*), and detailed descriptions of the entire NRDA process are described in Chapter 2 of the Draft Louisiana Regional Restoration Planning Program Programmatic Environmental Impact Statement (NOAA *et al.* 2003). The NRDA process consists of three phases: 1) Preassessment; 2) Restoration Planning; and 3) Restoration Implementation. During the Preassessment Phase, the Trustees determined whether they had jurisdiction to pursue an NRDA for this incident. Since the injuries were expected to continue, and feasible restoration alternatives existed to address those injuries, the Trustees proceeded with the Restoration Planning Phase. Restoration planning also was necessary because injuries were expected to continue and result in interim losses of natural resources and services from the date of the incident until the date of recovery. In the Restoration Planning phase, the Trustees identified a reasonable range of restoration alternatives, evaluated and identified a preferred alternative, and developed the Draft DARP/EA (July 2005) presenting the preferred alternative to the public. The Trustees solicited public comment on the Draft DARP/EA (July 2005); however, no comments were received and the document has been finalized without significant change.

Under the OPA regulations, the Final DARP/EA will be presented to the RP at the start of the Restoration Implementation Phase to implement or fund the Trustees' costs of implementing the plan, thus providing the opportunity for settlement of damage claims without litigation. Should the RP decline to settle the claim, the OPA authorizes Trustees to bring a civil action against the RP for damages, or to seek disbursement from the USCG's Oil Spill Liability Trust Fund. For this incident, however, the Trustees and RP worked cooperatively in the Preassessment and Restoration Planning Phases to assess injury to natural resources and services and identify restoration alternatives. The RP has agreed to implement the selected restoration alternative in this Final DARP/EA.

### **2.1.2 Regulatory Compliance of the Selected Restoration Alternative**

The selected restoration alternative presented in this Final DARP/EA complies with the key statutes, regulations, and policies listed in Appendix C.

## **CHAPTER 3: AFFECTED ENVIRONMENT**

The Trustees presented descriptions of the physical, biological, and cultural environment affected by the Mosquito Bay incident to comply with the NEPA. The affected environment provided habitat for a wide variety of fish, birds, mammals, and other organisms, and provided water filtration, protection from wind and storm surge, and other ecosystem services. The marsh also supported species that affect the Terrebonne Parish economy through commercial and recreational fishing, hunting, and wildlife viewing.

### **3.1 PHYSICAL ENVIRONMENT**

The Terrebonne Bay marshes are remnants of the ancestral LaFourche Delta complex that served as the outlet for the Mississippi River between 700 and 1500 years ago. These marshes have been lost gradually from subsidence and erosion caused largely by anthropogenic alterations to coastal rivers in Louisiana which have disrupted the natural processes of land building. The present marsh ecosystem supports a wide variety of aquatic and terrestrial species and is an important wintering and refuge area for waterfowl and other migratory bird species.

### **3.2 BIOLOGICAL ENVIRONMENT**

Bird species in the incident area include: snowy egrets (*Egretta thula*), double-crested cormorants (*Phalacrocorax auritus*), various species of gulls, brown (*Pelecanus occidentalis*) and white pelicans (*Pelecanus erythrorhynchos*), ospreys (*Pandion haliaetus*) and various hawks, kingfishers (*Megaceryle alcyon*), great blue herons (*Ardea herodias*), and many more. Wildlife in the area includes, but is not limited to, alligators (*Alligator mississippiensis*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethicus*), deer (*Odocoileus virginianus*), and coyotes (*Canis latrans*). This area also supports marine aquatic species. Fishes such as redfish (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), speckled trout (*Cynoscion nebulosus*), bay anchovy (*Anchoa mitchilli*), and tarpon (*Megalops atlanticus*), and many other species, are found in the waters of the Mosquito Bay. In the many portions of the Bay, shellfish such as crabs, oysters, and shrimp can be abundant. Five plant species common to the Mosquito Bay area are smooth cordgrass (*Spartina alterniflora*), saltmeadow cordgrass (*Spartina patens*), black needle rush (*Juncus roemerianus*), saltgrass (*Distichlis spicata*), and three-corner grass (*Schoenoplectus americanus*). Marsh soils/sediments support a rich infauna including mollusks (*Geukensia demissa*), crustaceans (*Uca spp.*) and polychaete worms.

### **3.3 THREATENED AND ENDANGERED SPECIES**

The Endangered Species Act (ESA) of 1973 (16 U.S.C. §§1531, *et seq.*) requires federal agencies to conserve endangered and threatened species and to conserve the ecosystems upon which these species depend. LDWF's Natural Heritage Program (LNHP) also identifies species that are of special concern to the State. Table 3.1 provides a list of federally recognized endangered or threatened species, as well as species utilizing designated critical habitat, reported to reside in or migrate through Point Au Fer Island.

**Table 3. 1 Species Listed as Threatened or Endangered under the ESA and LDWF Natural Heritage Program in Terrebonne Parish, Louisiana.**

Common Name	Scientific Name	Federal Status
West Indian manatee	<i>Trichechus manatus</i>	Endangered
brown pelican	<i>Pelecanus occidentalis</i>	Endangered
piping plover*	<i>Charadrius melodus</i>	Threatened
green sea turtle	<i>Chelonia mydas</i>	Threatened
hawksbill sea turtle	<i>Eretmochelys imbricata</i>	Endangered
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	Endangered
leatherback sea turtle	<i>Dermochelys coriacea</i>	Endangered
loggerhead sea turtle	<i>Caretta caretta</i>	Threatened

\*Designated critical habitat

### Piping Plover

On July 10, 2001, the U.S. Fish and Wildlife Service designated critical habitat for wintering piping plovers (Federal Register Volume 66, No. 132). Their designated critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for piping plovers 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. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation.

### **3.3.1 Threatened and Endangered Species**

#### **West Indian manatee (*Trichechus manatus*)**

West Indian manatees (Federally listed as endangered) occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams, during the summer months (*i.e.*, June through September). Manatees have been regularly reported in the Amite, Blind, Tchefuncte, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf Coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals.

**Brown pelican** (*Pelecanus occidentalis*)

Endangered brown pelicans are currently known to nest on Raccoon Island on Isles Dernieres, Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, Rabbit Island in Calcasieu Lake, and islands in the Chandeleur barrier island chain. Pelicans change nesting sites as habitat changes occur; thus, they may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. In winter, spring, and summer, nests are built in mangrove trees or other shrubby vegetation, although occasional ground nesting may occur. Brown pelicans feed in shallow estuarine water, 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.

**Piping plover** (*Charadrius melodus*)

Federally listed as a threatened species, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occurs along the Louisiana coast including Point Au Fer Island in Terrebonne Parish, Louisiana. 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 dependent on local weather and tidal conditions. Plovers move among sites as environmental conditions change.

**Kemp's Ridley sea turtle** (*Lepidochelys kempii*)

The Kemp's ridley is an endangered sea turtle that occurs mainly in the coastal areas of the Gulf of Mexico and northwestern Atlantic Ocean. Juveniles and sub-adults occupy shallow, coastal regions and are commonly associated with crab-laden, sand or muddy water bottoms. Small turtles are generally found in nearshore areas of the Louisiana coast from May through October. Adults may be abundant near the mouth of the Mississippi in the spring and summer. Adults and juveniles move offshore to deeper, warmer water during the winter. Between the East Gulf Coast of Texas and the Mississippi River Delta, Kemp's ridleys use nearshore waters, ocean sides of jetties, small boat passageways through jetties, and dredged and nondredged channels. Major threats to this species include over-exploitation on their nesting beaches, drowning in fishing nets, and pollution.

### **Green sea turtle (*Chelonia mydas*)**

Green sea turtles probably occur along the Louisiana coast and may nest on the barrier islands (Dundee and Rossman 1989). Their distribution can be correlated to water temperature, grassbed distribution, location of nesting beaches, and associated ocean currents. The primary nesting sites in U.S. Atlantic waters are along the east coast of Florida, with additional sites in the U.S. Virgin Islands and Puerto Rico (NMFS and USFWS 1991a). Females deposit up to 7 clutches, and the number of nests has been estimated to be between 350 to 2,300 nests annually. Green sea turtles nest at 2-, 3-, or 4-year intervals. Long migrations have been documented between feeding and nesting grounds. Adult green sea turtles feed almost exclusively on seagrasses growing in shallow water flats, but invertebrates and carrion are also important components of their diet (Dundee and Rossman 1989).

### **Hawksbill sea turtle (*Eretmochelys imbricata*)**

The likelihood of encountering this species in Louisiana coastal waters is considered minimal. Nesting occurs principally in Puerto Rico and the U.S. Virgin Islands. Within the continental United States, nesting is restricted to the southeast coast of Florida and the Florida Keys. Hawksbill turtles nest at low densities in aggregations of 1 to 100 adults. Less than two nests annually have been observed in Florida and Texas (NMFS and USFWS 1993). Only one record of a hawksbill in Louisiana has been reported (Fuller *et al.* 1987). This species is an omnivore, feeding primarily on invertebrates and marine vegetation (Dundee and Rossman 1989). Florida is considered foraging habitat for those turtles, and Texas may be foraging habitat for hatchlings and juveniles (77 observations of small turtles were reported between 1972 and 1984) from the nesting sites in Mexico (NMFS and USFWS 1993).

### **Leatherback sea turtle (*Dermochelys coriacea*)**

The leatherback sea turtle occurs mostly in continental shelf waters, but will occasionally enter shallow waters and estuaries. Adults are highly migratory and they exhibit seasonal fluctuations in distribution in response to the Gulf Stream and other warm water features. Habitat requirements for juvenile and post-hatchling leatherbacks are unknown. Leatherback turtles are omnivorous but feed primarily on jellyfish and other cnidarians (NMFS and USFWS 1992).

Nesting occurs from February through July at sites located from Georgia to the U.S. Virgin Islands. Nesting leatherbacks occur along beaches in Florida, Nicaragua, and islands in the West Indies; however, no nesting has been reported in Louisiana (Dundee and Rossman 1989). In Louisiana, leatherbacks are believed to occur offshore in deep waters.

### **Loggerhead sea turtle (*Caretta caretta*)**

Loggerheads are capable of living in a variety of environments, such as in brackish waters of coastal lagoons and river mouths. During the winter, they may remain dormant, buried in the mud at the bottom of sounds, bays, and estuaries. The major nesting beaches are located in the southeastern United States, primarily along the Atlantic coast of Florida, North Carolina, South Carolina, and Georgia (NMFS and USFWS 1991b). Loggerheads probably range all along the Louisiana coast; however, Dundee and Rossman (1989) reported specimens only from Chandeleur Sound and Barataria Bay in eastern waters of the state. The loggerhead's diet includes marine invertebrates such as mollusks, shrimp, crabs, sponges, jellyfish, squid, sea urchins, and basket stars (NMFS and USFWS 1991b). Adult loggerheads feed in waters less than 50 meters deep, while the primary foraging areas for juveniles appears to be in estuaries and bays.

The effects of the selected action on threatened and endangered species are discussed in Section 5.6.9.

### **3.4 ESSENTIAL FISH HABITAT**

Under the Magnuson-Stevens Fisheries Conservation and Management Act of 1996 (Public Law 104-297), the Gulf of Mexico Fishery Management Council identified Essential Fish Habitat (EFH) for those species managed under its fisheries management plans. EFH is defined by the act as being “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity”.

The Gulf of Mexico Fishery Management Council lists the following federally managed species within the project area of the selected restoration alternative: white shrimp (*Penaeus setiferus*), brown shrimp (*Penaeus aztecus*), and red drum (*Sciaenops ocellatus*). A brief discussion of the identified EFH and Habitat Areas of Particular Concern (EFH-HAPCs) local to and potentially affected by the selected project for each species follows:

#### **Distribution and summary of habitats used by shrimp**

Brown and white shrimp use a variety of habitats as they grow from planktonic larvae to spawning adults. Brown shrimp are found within estuaries to offshore depths of 110 meters throughout the Gulf; white shrimp inhabit estuaries and to depths of 40 meters offshore in the coastal areas extending from Florida's big bend through Texas. Brown and white shrimp are generally abundant in the central and western Gulf.

#### **Brown shrimp**

Brown shrimp eggs are demersal and occur offshore. The larvae occur offshore and begin to migrate to estuaries as postlarvae. Postlarvae migrate through passes on flood tides at night mainly from February – April with a minor peak in the fall. Postlarvae and juveniles are common to highly abundant in all U.S. estuaries from Apalachicola Bay in

the Florida panhandle to the Mexican border. In estuaries, brown shrimp postlarvae and juveniles are associated with shallow vegetated habitats but also found over silty sand and non-vegetated mud bottoms. Postlarvae and juveniles have been collected in salinity ranging from zero to 70 ppt.

The density of postlarvae and juveniles is highest in marsh edge habitat and submerged vegetation, followed by tidal creeks, inner marsh, shallow open water, and oyster reefs; in unvegetated areas muddy substrates seem to be preferred. Juveniles and sub-adults of brown shrimp occur from secondary estuarine channels out to the continental shelf but prefer shallow estuarine areas, particularly the soft, muddy areas associated with plant-water interfaces. Sub-adults migrate from estuaries at night on ebb tide on new and full moon. Abundance offshore correlates positively with turbidity and negatively with hypoxia. Adult brown shrimp occur in neritic Gulf waters (*i.e.*, marine waters extending from mean low tide to the edge of the continental shelf) and are associated with silt, muddy sand, and sandy substrates.

### **White shrimp**

White shrimp are offshore and estuarine dwellers and are pelagic or demersal, depending on life stage. The eggs are demersal and larval stages are planktonic; both occur in nearshore marine waters. Postlarvae migrate through passes mainly from May-November with peaks in June and September. Migration is in the upper two meters of the water column at night and at mid-depths during the day.

Postlarval white shrimp become benthic upon reaching the nursery areas of estuaries, where they seek shallow water with muddy-sand bottoms high in organic detritus or abundant marsh, and develop into juveniles. Juveniles are common to highly abundant in all Gulf estuaries from Texas to about the Suwanee River in Florida. Postlarvae and juveniles inhabit mostly mud or peat bottoms with large quantities of decaying organic matter or vegetative cover. Densities are usually highest in marsh edge and submerged aquatic vegetation, followed by marsh ponds and channels, inner marsh, and oyster reefs.

Juveniles prefer lower salinity waters (less than 10 ppt), and are frequently found in tidal rivers and tributaries throughout their range. As juvenile white shrimp approach adulthood, they move from the estuaries to coastal areas where they mature and spawn. Migration from estuaries occurs in late August and September and appears to be related to size and environmental conditions (*e.g.*, sharp temperature drops in fall and winter). Adult white shrimp are demersal and generally inhabit nearshore Gulf waters to depths less than 30 meters on bottoms of soft mud or silt.

### **Distribution and summary of habitats used by red drum**

Red drum are distributed over a geographical range from Massachusetts on the Atlantic coast to Tuxpan, Mexico (Simmons and Breuer 1962). In the Gulf of Mexico, red drum occur in a variety of habitats, ranging from depths of about 40 meters offshore to very shallow estuarine waters. They commonly occur in virtually all of the Gulf's estuaries

where they are found over a variety of substrates including sand, mud and oyster reefs. Red drum can tolerate salinities ranging from freshwater to highly saline, but optimum salinities for the various life stages have not been determined.

Types of habitat occupied depend upon the life stage of the fish. Spawning occurs in deeper water near the mouths of bays and inlets, and on the Gulf side of the barrier islands (Simmons and Breuer 1962). The eggs hatch mainly in the Gulf, and larvae are transported into the estuary where the fish mature before moving back to the Gulf (Perret *et al.* 1980). Adult red drum use estuaries, but tend to spend more time offshore as they age. Schools of large red drum are common in deep Gulf waters. All marine habitat of the Gulf where red drum are known to occur is considered essential habitat for red drum.

Larval red drum feed almost exclusively on mysids, amphipods, and shrimp, whereas larger juveniles feed more on crabs and fish. Overall, crustaceans (crabs and shrimp) and fishes are most important in the diet of red drum; primary food items are blue crabs, striped mullet, spot, pinfish, and pigfish. As they grow larger, red drum eat proportionately more crabs, with fish diminishing in importance as food for the largest red drum. Protection of estuaries is especially important not only to maintenance of EFH for red drum but also because so many of the prey species of red drum are estuarine dependent (*e.g.*, shrimp, blue crab, striped mullet and pinfish).

### **3.5 CULTURAL ENVIRONMENT AND HUMAN USE**

Ever since the early 1600s when the French explorer Robert Cavelier, Sieur de La Salle, successfully reached the mouth of the Mississippi River, the Mississippi River Delta has become widely known as an area with abundant natural resources. A variety of cultures have existed in this region, including Native American, Spanish, French, British, Acadian (Cajun), Creole, and African.

The Mosquito Bay area is relatively undeveloped and human use is limited to recreational fishing and hunting, commercial fishing, oil and gas exploration, and industrial activities. This area has been used historically for commercial and recreational crabbing, trapping, hunting, and fishing, and for wildlife viewing. Ecotourism has been increasingly important to the Terrebonne Parish economy.

The Atchafalaya Delta Wildlife Management Area (WMA), and LDWF-operated WMA that provides a wide variety of recreation activities, was not affected by the incident. It is across open water about 15 miles northwest of the discharge.

## CHAPTER 4: INJURY ASSESSMENT

The Trustees' quantified the nature, degree, and extent of injuries to natural resources and services resulting from the Mosquito Bay incident. They assessed injury after the discharge of natural gas condensate and the subsequent controlled burn. They continued with their injury assessment during the Preassessment Phase of the NRDA process. The Trustees used a Habitat Equivalency Analysis (HEA) model to quantify injuries to natural resource injuries and services.

### 4.1 OVERVIEW OF THE PREASSESSMENT PHASE AND FINDINGS

The Trustees initiated Preassessment activities for the Mosquito Bay incident shortly after notification of the discharge. The Trustees focused on collecting ephemeral data that would address three criteria defined by the OPA (15 C.F.R. §990.42) and OSPRA (LAC 43:XXIX.101 *et seq.*):

- injuries have resulted, or probably will result, from the incident;
- response actions have not adequately addressed, or are not expected to address, the injuries resulting from the incident; and
- feasible primary and/or compensatory restoration actions exist to address the potential injuries.

All of these criteria must be addressed before the Restoration Planning Phase begins.

Preassessment activities to determine if injury occurred to natural resources and services were related to environmental monitoring activities that were required after the controlled burn. The RP was required to complete Burn Authorization Forms, which included Guidelines for Monitoring *In-Situ* Burns of On-Shore Oil Spills, before performing the *In-Situ* controlled burn. Those guidelines required baseline information be collected in the following sequence: 1) immediately prior to burning; 2) post burn; 3) during the following mid-growing season; and 4) during the second growing season. Site observations and field reports (personal communication, C. Henry, NOAA, April 2001) documented the affected environment prior to burning and post burn. Additional reports documented the affected environment after the first and second mid-growing seasons (John Chance Land Surveys, Inc. 2001; 2002). The first mid-season sampling event was conducted on September 25, 2001. A third-party contractor for the landowner also evaluated vegetative recovery after the discharge of natural gas condensate and subsequent controlled burn during the first mid-growing season (Materne 2002). Additional sampling after the burn occurred during the second mid-growing season on August 1, 2002 and September 3, 2002 (John Chance Land Surveys, Inc. 2002).

During both mid-growing season studies, vegetative cover and stem density measurements were taken after the burn and soil samples were collected to test for natural gas condensate. Data collection methods were similar between years. Total species-specific vegetative cover was determined with the Braun-Blanquet Cover-Abundance Scale. Stem density measurements were conducted by counting all stems in a 0.25 m<sup>2</sup>

quadrat randomly placed around each sample point. A scaleable aerial photograph was obtained of the affected area to identify sampling points. A separate, third-party contractor for the landowner evaluated vegetative recovery qualitatively in the affected area. Data presented below were extensively summarized for this Final DARP/EA from five primary reports (Coastal Environments, Inc. 2002; Ensminger 2002; John Chance Land Surveys, Inc. 2001; 2002; Materne 2002) and site observations and field reports from NOAA personnel (personal communication, C. Henry, NOAA, April 2001; personal communication, J. Kern, NOAA, May 2001).

Anecdotal reports from NOAA field personnel indicated fiddler crabs and other fauna appeared to partially re-colonize to the burned area about one month after the discharge. They also noted some areas had vegetation re-growth (personal communication, C. Henry, NOAA, April 2001; personal communication, J. Kern, NOAA, May 2001). Field surveys during the first mid-growing season indicated that some affected areas had persistent, elevated TPH levels in marsh sediments one year after the burn (Coastal Environments, Inc. 2002; John Chance Land Surveys, Inc. 2002), and sheen was observed coming from sediments at the ground zero site one year after the discharge (5/31/02). Aerial flights over the affected section of Point Au Fer Island indicated that several areas had converted to open water and an extensive number of marsh buggy and airboat trails were visible (Ensminger 2002). This was of particular importance because one full growing season had occurred and plant recolonization in these areas had not taken place (Ensminger 2002). During the second mid-growing season, some areas of affected marsh had not reached equivalency of adjacent non-affected marsh (Materne 2002).

Using this information collected during the Preassessment Phase, the Trustees determined that injuries had occurred as a result of the natural gas condensate discharge, and while response actions were taken quickly, they were unable to fully address the impacts of natural gas condensate to the environment. Additionally, feasible restoration compensatory restoration project exist to address the potential injuries. Since all three OPA criteria listed above were met, the Trustees released a Notice of Intent to conduct restoration planning and proceeded into the Restoration Planning Phase.

#### **4.2 INJURY ASSESSMENT STRATEGY**

The goal of injury assessment under the OPA is to determine the nature, degree, and extent of injuries to natural resources and services, thus providing a technical basis for evaluating the need for, type of, and scale of restoration actions. The OPA and OSPRA rules define injury as "...an observable or measurable adverse change in a natural resource or impairment of a natural resource service. Injury may occur directly or indirectly to a natural resource and/or service" (15 C.F.R. §990.30 and LAC 43:XXIX.109).

There are two stages to injury assessment: injury determination and injury quantification. Injury determination began with the identification and selection of potential injuries to investigate. The OPA and OSPRA regulations allowed the Trustees to consider several factors when making the injury determination, including, but not limited to:

- the natural resources and services of concern;
- the evidence indicating exposure, pathway and injury;
- the mechanism by which injury occurred;
- the type, degree, spatial and temporal extent of injury;
- the adverse change or impairment that constitutes injury;
- available assessment procedures and their time and cost requirements;
- the potential natural recovery period; and
- the kinds of restoration actions that are feasible.

The Trustees considered all of the factors listed above before injury determinations (discussed below) for this incident were made.

### **4.3 INJURY ASSESSMENT PROCEDURES**

The Trustees considered five factors required by the OPA and OSPRA regulations before they selected injury assessment procedures:

- the range of procedures available under the OPA regulations (15 C.F.R. §990.27(b)) and OSPRA regulations (LAC 43:XXIX.121);
- the time and cost necessary to implement the procedures;
- the potential nature, degree, and spatial and temporal extent of the injury;
- the potential restoration actions for the injury; and
- the relevance and adequacy of information generated by the procedures to meet information requirements of restoration planning.

The Trustees and RP agreed to use simple, cost-effective procedures to document natural resource and service injuries. These procedures relied on information gathered from the response and Preassessment Phase activities, relevant peer-reviewed literature, and the best professional judgment of local experts and Trustees familiar with the effects of natural gas condensate in similar environments. The Trustees' assessment of natural resource injuries was focused on marsh habitat because effects to other resources and services were considered minimal. Marsh habitat included marsh vegetation, sediments, fauna, and adjacent coastal waters.

### **4.4 INJURY DETERMINATION**

The trajectory and extent of injury from the natural gas condensate was determined cooperatively by the Trustees and RP during the initial response using overflight observations, photography, and on-water and field surveys. The Trustees and RP considered potential injuries to wildlife, birds, fish, and water column biota during the initial response and controlled burn. Fish and birds were observed using marsh and adjacent aquatic habitats after the discharge, thus the services the marsh provides to these natural resources were probably injured. The Trustees and RP observed limited mortality or injury to fish, birds, and other organisms during the incident response, but definitive counts were not conducted since field operations had the potential to exacerbate injury to

marsh. They also determined 12.7 acres of marsh habitat were directly injured by the discharge. The controlled burn removed most natural gas condensate from the 12.7 acre parcel. An additional 93.3 additional acres of marsh were burned when the fire progressed outside the planned burn area.

#### **4.4.1 Fish, Wildlife, Water Column Organisms, and Other Species' Injury**

Although fish, birds, water column organisms, and other species had the potential to be injured from the discharge and response actions, information gathered during the Preassessment Phase indicated injuries to these resources were probably minimal compared to overall marsh injury. The injury to these resources was integrated into the injury assessment of marsh habitat. Therefore, further assessment of these resources was not carried forward into the Restoration Planning Phase. The Trustees and RP agreed that protective estimates of marsh injuries would compensate for potential injuries to all other natural resources and services affected by the Mosquito Bay incident.

#### **4.4.2 Marsh Injury**

The RP and Trustees worked cooperatively to assess injuries to marsh habitat from the Mosquito Bay incident. They determined 12.7 acres of marsh habitat were injured by the discharge. The controlled burn removed most natural gas condensate from the 12.7 acre parcel. An additional 93.3 additional acres of marsh were burned when the fire progressed outside the planned burn area. A total area of 106 acres was considered injured as a result of the incident (Figure 4.1).

The total injured area was divided into six sub-areas because the marsh was not equally affected by the discharge and response actions:

- 1) Area burned during the response, but not directly affected by the natural gas condensate discharge (93.3 acres);
- 2) Area lightly/moderately affected by the natural gas condensate discharge and burned during the response (7.8 acres);
- 3) Area lightly/moderately affected by the natural gas condensate discharge, burned during the response, and was converted to open water (0.9 acres);
- 4) Area heavily affected by the natural gas condensate discharge and burned during the response (3.0 acres);
- 5) Area within 'ground zero' that was heavily affected by the natural gas condensate discharge (0.5 acres); and
- 6) Area within 'ground zero' that was heavily affected by the natural gas condensate discharge and will not recover (0.5 acres).

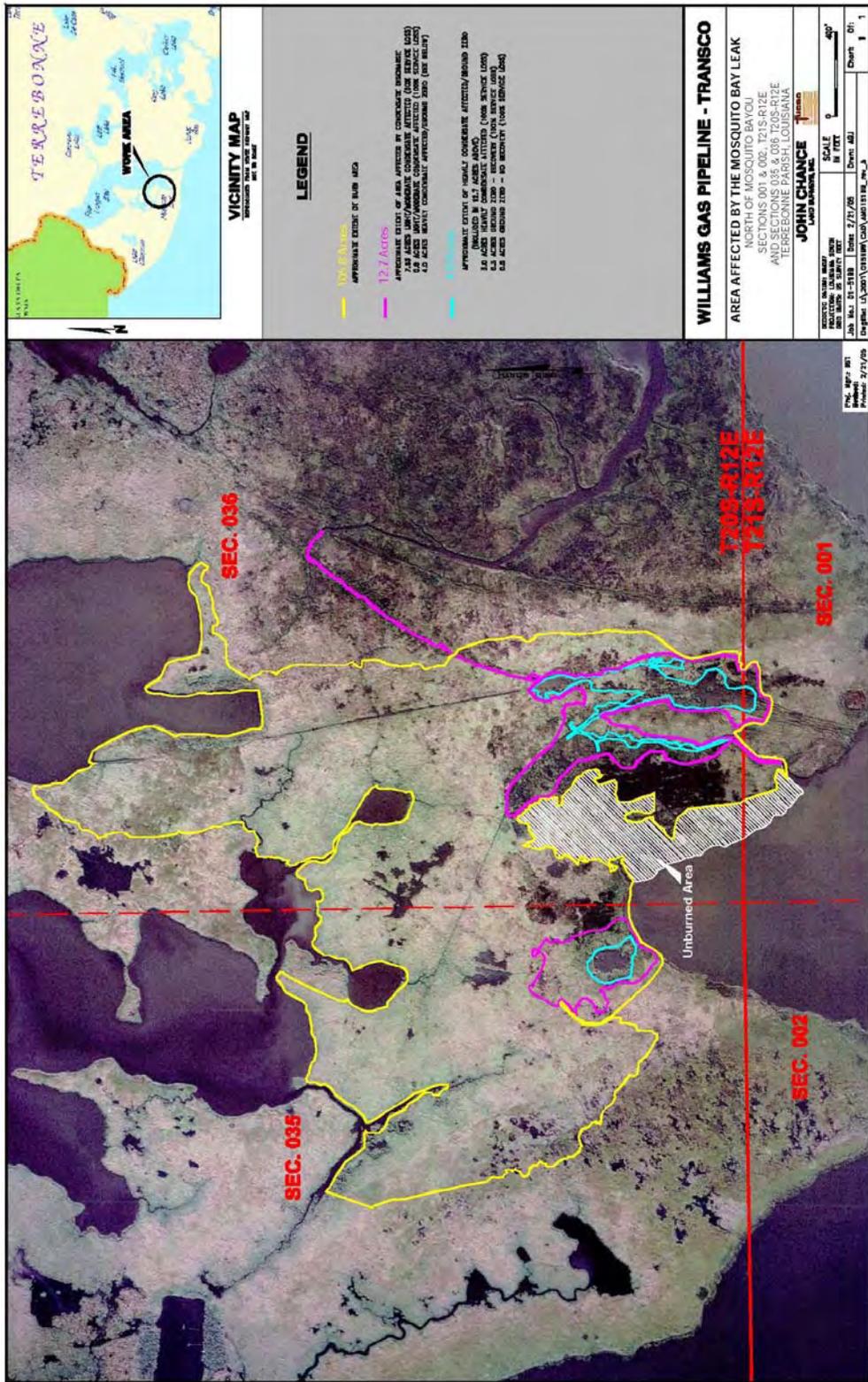


Figure 4.1 Delineation of injuries from the Mosquito Bay incident on Point Au Fer Island, Terrebonne Parish, LA.

Once the area and degree of injury were established for each of the six sub-areas, the Trustees and RP assigned an estimate of lost services based on professional judgment and experience with other natural gas condensate discharges. A field investigation conducted by the Trustees and RP on May 8, 2001, and May 31, 2002, aerial photography, and annual monitoring reports by the RP's contractor, provided additional information to refine estimates of service loss and recovery.

#### *4.4.2.1 Estimates of Service Loss for Six Sub-Areas Affected by the Mosquito Bay Incident*

Service losses ranged from 10% to 100% in six injury categories. The Trustees believed the service loss estimates were protective of the environment and resulted in upper-bound injury estimates. The Trustees and RP chose not to further refine the injury estimates through in-depth studies. The Trustees believed that the type and scale of restoration actions would not substantially change as a result of more detailed injury assessments. In addition, the costs of refining the injury estimate would have been greater than the potential benefits from information gained. The Trustees were confident that estimated service losses in six categories accurately reflected the overall injury to marsh and marsh services, were protective of the environment, and ensured that the public would be made whole for the losses incurred.

The RP and Trustees agreed that the 93.30 acre sub-area burned during the response, but not directly affected by the natural gas condensate, had a 10% service loss. They agreed the estimate of service loss was reasonable and protective of the environment because burning was observed to have minor and temporary effects on the height and shoot density of dominant vegetative species and fauna would be quick to recover population densities.

The RP and Trustees agreed that the 7.83 acre sub-area affected by light to moderate natural gas condensate and burning had a 50% service loss. They agreed the estimate of service loss was reasonable and protective of the environment because the combination of burning and exposure to discharged material affected fauna, marsh sediments, and marsh vegetation.

The 0.87 acre sub-area affected by light to moderate natural gas condensate and burning was assigned a 100% service loss because habitat was converted to open water from the incident response.

The RP and Trustees agreed that the 3.00 acre sub-area affected by heavy natural gas condensate and burning had a 100% service loss.

The 1.00 acre sub-area referred to as ground zero, where the natural gas condensate was heaviest and the fire most intense, was assigned a service loss of 100%.

#### *4.4.2.2 Estimates of Recovery Time for Six Sub-Areas Affected by the Mosquito Bay Incident*

In summary, marsh recovery periods ranged from six months to 15 years in six injury categories. The Trustees believed the recovery periods were protective of the environment and resulted in upper-bound injury estimates and were confident that the projected recovery periods ensured that the public would be made whole for the losses incurred.

The RP and Trustees agreed that the 93.30 acre sub-area burned during the response, but not directly affected by the natural gas condensate, would recover fully in six months. The recovery time for this sub-area was based on Trustee and RP observations of the site after the burn.

The RP and Trustees agreed that the 7.83 acre sub-area affected by light to moderate natural gas condensate and burning would recover fully in two years. The recovery time for this sub-area was based on region-specific research that indicated a two-year recovery period was conservative (DeLaune *et al.* 1997, Pahl *et al.* 1997, Lindau *et al.* 1999). The Trustees and RP also considered Louisiana-specific research that indicated water elevation and season affected marsh recovery after burns (Mendelsohn *et al.* 1995; Lin *et al.* 2002).

The 0.87 acre sub-area affected by light to moderate natural gas condensate, burned, and converted to open water was not projected to recover at all. This sub-area probably will be lost in 10 years given the rate of coastal land loss recorded in the area (USGS 2003); therefore, it was estimated to have a 100% service loss from the time of the release to 2011, after which no further injury was calculated.

The RP and Trustees agreed that the 3.00 acre sub-area affected by heavy natural gas condensate and burning would fully recover in four years. The recovery time for this sub-area was based on field studies that indicated the persistence of total petroleum hydrocarbons (TPH) levels in marsh sediments more than one year after the burn (John Chance Land Surveyors, Inc. 2002) and the belief that the heat of the fire combined with low water caused root burn that would delay recovery.

Two 0.50 acre sub-areas described as ground zero were assigned different recovery times. The Trustees and RP agreed that one 0.5 acre sub-area would recover in five years based on field studies that indicated the persistence of TPH levels in marsh sediments more than one year after the burn (John Chance Land Surveyors, Inc. 2002) and the belief that the heat of the fire combined with low water caused root burn that would delay recovery. The Trustees and RP determined that the second 0.5 acre sub-area would not recover before it naturally converted to open water within 15 years.

#### 4.5 INJURY QUANTIFICATION

The Trustees used a Habitat Equivalency Analysis (HEA [NOAA 2000]) model to quantify the effects of the discharged natural gas condensate and controlled burn. Interim losses (i.e., from the time of injury until recovery to baseline) were quantified as lost habitat service acre years, where a service acre year was the flow of services from one acre of habitat for one year. Using the injury parameters described above and applying a discount rate of 3% per year (NOAA 1999), the Trustees and RP quantified injuries as 30.57 discount service acre years (DSAYs) (NOAA 2005). This injury accounted for reductions in the entire flow of marsh habitat services, including negligible losses of birds, fish, water column organisms, and other species.

**Table 4.1 HEA model inputs for acreage, service loss, and projected recovery of services to baseline for six sub-areas of marsh injured by the Mosquito Bay incident.**

Model Parameter	Burned/No natural gas condensate	Light- moderate natural gas condensate/ Burned	Light- moderate natural gas condensate/ Burned	Heavy natural gas condensate/ Burned	Ground Zero/Recovery	Ground Zero/No recovery
Acreage	93.30	7.83	0.87	3.00	0.50	0.50
Service Loss	10%	50%	100%	100%	100%	100%
Period of loss	6 months	2 years	10 years	4 years	5 years	15 years

## **CHAPTER 5: RESTORATION SELECTION**

The goal of restoration under the OPA and OSPRA is to restore natural resources injured by incidents to the condition that they would have been if the incident had not occurred. The OPA and OSPRA regulations require that this goal be achieved by restoring natural resources and compensating for interim losses of those resources and their services that occur during the period of recovery.

### **5.1 RESTORATION STRATEGY**

Restoration actions are defined as primary or compensatory. Primary restoration actions are actions that restore injured resources to their baseline condition (that is, their condition prior to the release of oil). Active primary restoration is an action that expedites the return of injured resources to their baseline condition. Compensatory restoration addresses interim losses of natural resource services from the time of initial injury until full recovery of natural resources to their baseline condition. Natural recovery, in which no human intervention is taken to restore the injured resources, is considered a primary restoration alternative, and is appropriate where feasible or cost-effective primary restoration actions are not available or where the injured resources would recover relatively quickly without human intervention. The scale of the compensatory restoration projects depends on the nature, extent, severity, and duration of the resource injury. Primary restoration actions that speed resource recovery would reduce the scale of compensatory restoration.

The Trustees determined that the area impacted by this incident has either recovered or, in the areas where injury persists, will recover to baseline conditions naturally over time. Active primary restoration was considered by the Trustees, but it was decided that such activities would not contribute significantly to the recovery of the injured area. Therefore, the focus of this chapter of the Final DARP/EA is on compensatory restoration actions for the Mosquito Bay incident.

### **5.2 EVALUATION CRITERIA**

The OPA regulations (15 C.F.R. §990.54) and OSPRA regulations (LAC 43:XXIX.125) require the Trustees to identify restoration alternatives based on the following criteria presented in the order given in the regulations:

- 1) Cost to carry out the alternative;
- 2) Extent to which each alternative is expected to meet the Trustees' goals and objectives in returning the injured natural resources and services to baseline and/or compensating for interim losses;
- 3) Likelihood of success of each alternative;
- 4) Extent to which each alternative will prevent future injury as a result of the incident and avoid collateral injury as a result of implementing the alternative;
- 5) Extent to which each alternative benefits more than one natural resource and/or service; and

6) Effect of each alternative on public health and safety.

Based on the criteria listed above the trustees compiled a preliminary list of potential restoration alternatives. Following this, the trustees conducted a first tier and second tier screening, which led to a list of five possible restoration alternatives. Of these five projects, one was selected as the restoration alternative to compensate the public for losses of natural resources and services from the Mosquito Bay incident. Section 5.3 describes the selection process. Sections 5.4 through 5.6 provide detailed information on the selected alternatives for primary and compensatory restoration and the non-selected alternatives.

### **5.3 SELECTION OF THE RESTORATION ALTERNATIVES**

#### **5.3.1 Preliminary List of Restoration Alternatives**

The trustees identified 23 restoration alternatives that were located within the same watershed as the injured habitat, and exhibited a sufficient nexus to the injured habitat; that is, each alternative was capable of compensating for the injury through either the creation, enhancement, or protection of coastal herbaceous wetlands. The restoration alternatives ranged in scope and design from shoreline armoring to marsh creation by terracing. The preliminary list of 23 restoration alternatives identified, including a brief description, the sponsor organization, and their location (by parish), is provided in Appendix D.

#### **5.3.2 First Tier Screening**

After the preliminary list of restoration alternatives was compiled, the trustees conducted a first tier screening of the preliminary restoration alternatives. Because the preference under OPA is for in-kind restoration where possible and otherwise consistent with the criteria listed in Section 5.2, the trustees screened the preliminary list of 23 restoration alternatives based on their strength of nexus to the injury. This criterion is important to the trustees because it ensures that the public is made whole from losses resulting from the incident. Of the 23 alternatives screened, 14 were considered to have a strong nexus to the injured resource (*i.e.* brackish marsh) due to their potential to compensate for injuries to brackish marsh through the restoration of habitat equivalent to that of brackish marsh. Basic project descriptions for the remaining 14 alternatives are listed below:

*Canal filling along southeastern Mosquito Bay:* This project would create approximately 6.25 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.

*Canal filling along eastern Mosquito Bay:* This project would create approximately 13.5 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal

and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.

*Canal filling southwest of Mosquito Island:* This project would create approximately 7.34 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.

*Shoreline Protection (using A-jacks technology) north of the inlet to Mosquito Bay:* This project would stabilize an eroding shoreline (estimated 10-15 feet/year in vicinity of Point Au Fer Island [Connor *et al.* 2004a; Conner *et al.* 2004b]) along Four League Bay, north of the inlet to Mosquito Bay, through the placement of approximately 1,800 feet of A-jacks type shoreline armor. The project is estimated to result in a benefit of 8.06 acres over the life of the project.

*Shoreline Protection (using articulated concrete mats) north of the inlet to Mosquito Bay:* This project would stabilize an eroding shoreline (estimated 10-15 feet/year in vicinity of Point Au Fer Island [Connor *et al.* 2004a; Conner *et al.* 2004b]) along Four League Bay, north of the inlet to Mosquito Bay, through the placement of approximately 1,800 feet of articulated concrete mats adjacent to the shoreline. The project is estimated to result in a benefit of 8.06 acres over the life of the project.

*Canal mouth closure along SE Mosquito Bay:* This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 2.52 acres of brackish marsh.

*Canal mouth closure along eastern Mosquito Bay:* This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 4.72 acres of brackish marsh.

*Canal mouth closure southwest of Mosquito Island:* This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 3.35 acres of brackish marsh.

*Vegetative plantings along the North Shore of Lost Lake:* This project entails planting smooth cordgrass (*Spartina alterniflora*) along the banks of Lost Lake with the intent to slow the erosion of low-lying marshes through the stabilization of sediments.

*Pointe Aux Chenes Hydrologic Restoration:* This project entails installing numerous water control structures, and repairing gaps in levees, in an impounded area immediately southwest of the Pointe Au Chien WMA.

*Four Mile Canal/ Bar Mouth:* This project entails constructing a rock sill designed to reduce scouring, curb bank-line erosion, and help restore a more natural flow and aid the lower reaches of Onion Bayou and the Vermilion River; thereby, enhancing sediment trapping in the 4-mile canal and Little Vermilion Bay terracing projects. It will also be designed to enhance freshwater retention in adjacent marshes.

*Grand Bayou Blue Dredge and Fill:* This project entails plugging several breaches in the levee/ridge along Grand Bayou Blue. Following plugging of the breaches, sediments dredged from Grand Bayou Blue will be deposited into an approximately 100 acre area to create marsh.

*Pointe Au Chien WMA marsh creation project:* This project entails constructing 2,000 to 3,000 feet of earthen containment within the Pointe Au Chien WMA. Following construction of the containment, sediment will be dredged from within the WMA and deposited to create approximately 100 acres of marsh.

*Plug canals cut through the East bank of Bayou Terrebonne:* This project entails plugging the mouth of various oil and gas access canals that have been cut through the natural levee of Bayou Terrebonne.

### 5.3.3 Second Tier Screening

After the first tier screening was completed, the trustees conducted a second tier screening of the 14 alternatives listed above by applying the OPA criteria to select a restoration alternative. This final screening resulted in the identification of five alternatives and the selection of one restoration alternative to address injuries caused by the Mosquito Bay incident. The application of the OPA criteria to the 14 alternatives during the second tier screening criteria is shown in Table 5.1.

**Table 5.1** Results of the second tier screening conducted on the 14 potential restoration alternatives. (+) indicates a strong relationship or likely to occur between the project and that criterion, (0) indicates moderate, and (-) indicates a weak relationship or not likely to occur between the project and that criterion.

Project	OPA Criteria (as numbered in Section 5.2)						Considered further*
	#1	#2	#3	#4	#5	#6	
Canal filling along SE Mosquito Bay	0	+	+	+	+	-	Y
Canal filling along E. Mosquito Bay	0	+	+	+	+	-	Y
Canal filling SW of Mosquito Island	0	+	+	+	+	-	Y
Shoreline Protection (using A-jacks) N of the inlet to Mosquito Bay	0	0	0	0	0	-	N

Project	OPA Criteria (as numbered in Section 5.2)						
	#1	#2	#3	#4	#5	#6	Considered further*
Shoreline Protection (using articulated concrete mats) N of the inlet to Mosquito Bay	0	0	0	0	0	-	N
Canal mouth closure along SE Mosquito Bay	0	0	0	0	0	-	N
Canal mouth closure along E. Mosquito Bay	0	0	0	0	0	-	N
Canal mouth closure SW of Mosquito Island	0	0	0	0	0	-	N
Vegetative plantings along the North Shore of Lost Lake	0	0	-	+	+	-	N
Pointe Aux Chenes Hydrologic Restoration	0	-	0	+	+	-	N
Four Mile Canal/ Bar Mouth	0	-	0	+	+	-	N
Grand Bayou Blue Dredge and Fill	0	0	+	+	+	-	Y
Point Au Chiene WMA marsh creation	0	0	+	+	+	-	Y
Plug canals cut through the E. bank of Bayou Terrebonne	0	-	0	0	0	-	N

\*This is not an OPA criterion. Its purpose is to aid the reader in identifying the projects that emerged as a result of the second tier screening.

#### 5.4 EVALUATION OF THE NO ACTION/ NATURAL RECOVERY ALTERNATIVE

The NEPA requires the Trustees to consider a “no action” alternative, and the OPA and OSPRA regulations require consideration of the natural recovery option. These options are equivalent. Under this alternative, the Trustees would take no direct action to restore injured natural resources. Instead, the Trustees would rely on natural processes for recovery of the injured natural resources. The principal advantages of this approach are the ease of implementation and cost-effectiveness. This approach relies on the capacity of ecosystems to “self-heal” and, in this case, is selected as the primary restoration alternative.

While natural recovery of the injured natural resources would occur over time, compensation for interim losses would not be provided under the no action/natural recovery alternative. The OPA and OSPRA regulations, however, clearly establish Trustee responsibility to seek compensation for interim losses pending recovery of the natural resources; therefore, because losses were suffered during the period of recovery

from this incident and technically feasible, cost-effective alternatives exist to compensate for these losses, the no action/natural recovery option is not selected as a compensatory restoration alternative.

### **5.5 SELECTED COMPENSATORY RESTORATION ALTERNATIVE: CANAL FILLING SOUTHWEST OF MOSQUITO ISLAND**

The Trustees selected one compensatory restoration alternative using the evaluation criteria presented in Section 5.2. The description and analysis of the project below, as well as how the restoration project was scaled to restore natural resource and service injuries, are based on a project-specific preliminary design concept rather than detailed engineering plans. Now that the alternative is selected in this Final DARP/EA, the project will undergo pre-project engineering to design the marsh, containment dikes, and the dredged material borrow area(s). These steps prior to construction are not expected to reduce the anticipated benefits of the project or affect the analyses conducted for ESA, EFH, or NEPA.

#### **Project Description**

The selected compensatory project alternative for marsh injuries is the Canal Filling Southwest of Mosquito Island marsh creation project. The project will be designed to create at least six and a half acres of brackish marsh on Point Au Fer Island, Terrebonne Parish, LA (Figure 5.2). Six and a half acres are required to compensate the public, but the selected project's footprint is large enough for the creation of seven and a third acres. The property is currently owned by the Archdiocese of New Orleans and many portions of Point Au Fer Island are actively managed by representatives of the Archdiocese to enhance habitat for wildlife and waterfowl.

The selected project is the filling of an abandoned oil and gas canal southwest of Mosquito Island, in the northeast portion of Point Au Fer Island adjoining Four League Bay. The nominal construction width of the oil and gas canal was 80 feet. However, based on aerial photography, it appears that erosion has widened the canal. There is also widening at its terminus for the drill rig barge that was once occasionally present. Based on field reconnaissance, the average depth of the canal is 3.3 feet.

Conceptual designs first entail closing the mouth of the canal, as well as an outlet to a lake at the opposite terminus, with an earthen dike to prevent loss of fill material and protect the loose sediments against erosion from waves. Containment will also be constructed where existing marsh or spoil bank elevations will not adequately contain the material. The dike will likely be constructed using a marsh buggy. Construction specifications of the containment dikes will be determined following pre-engineering data collection and during engineering and design of the project. If the containment dikes have not subsided to marsh elevation before the vegetation is planted, they will be degraded.

Following construction of the containment dikes, overflow weirs or sluice boxes will be constructed to allow water used to convey the dredged sediment to escape. Once in

place, hydraulic dredging operations will commence in Four League Bay, and fill will be transported to the canal via slurry pipeline (temporarily assembled on the water surface) and deposited until the fill is about 1 foot above present marsh elevation. Following de-watering and compaction of the dredged material through natural processes, the substrate will be manually planted with native vegetation.

*Spartina patens* and/or *S. alterniflora* will be planted within the marsh creation area. Plants will be nursery grown and will likely be multi-stemmed. Plant spacing will be determined during engineering and design of the project and may vary depending on the availability of various sizes of plants.

### **Restoration Goal**

To create a sustainable, structurally and functionally equivalent, coastal herbaceous wetland that compensates the public for lost services and resources due to the incident.

### **Probability of Success**

Creating marsh using dredge and fill technology is a feasible and proven technique with established methods. The technique has been used throughout coastal Louisiana by local, state, and federal agencies, as well as the general public, to create wetlands in an effort to address wetland loss and for mitigation. This selected alternative, as opposed to many created marshes which have a high degree of exposure (*i.e.*, to erosive forces such as wave action), should have greater longevity due to the protection of surrounding marsh. Additionally, the filling (or backfilling) of canals provides secondary benefits to surrounding marsh by re-establishing hydrology interrupted by the initial dredging of the oil and gas canal. Thus, the Trustees believe that this project has a high likelihood of success.

### **Performance Criteria and Monitoring**

Project performance will be assessed by comparing quantitative monitoring results to predetermined performance standards that define the minimum physical or structural conditions deemed to represent normal and acceptable development of a marsh. The monitoring program for this project will use these standards to determine whether the project goals and objectives have been achieved, and whether corrective actions are required to meet the goals and objectives. Details concerning the performance measures and monitoring will be developed prior to implementation of the project.

In the event that performance standards are not achieved or monitoring suggests unsatisfactory progress toward meeting established performance standards, corrective actions will be implemented. Possible corrective actions may include but are not limited to fertilization of the plant community to enhance vegetative productivity or planting vegetation in areas that experienced dieback.

## Scaling Approach

The habitat equivalency analysis (HEA) method was used to determine the size of the marsh restoration needed to compensate for the losses resulting from the incident (NOAA 1999). HEA is a resource-to-resource scaling method to determine compensation for lost services, employed so that resources and services provided through restoration are equated with those lost. To quantify restoration benefits, HEA uses several project-specific factors in scaling restoration, including elapsed time from the onset of injury to restoration implementation, relative productivity of restored habitats (that is, the proportional equivalence of ecological services provided by the compensatory restoration project relative to the baseline productivity of the injured habitat), time required for restored habitats to reach full function, and project lifespan.

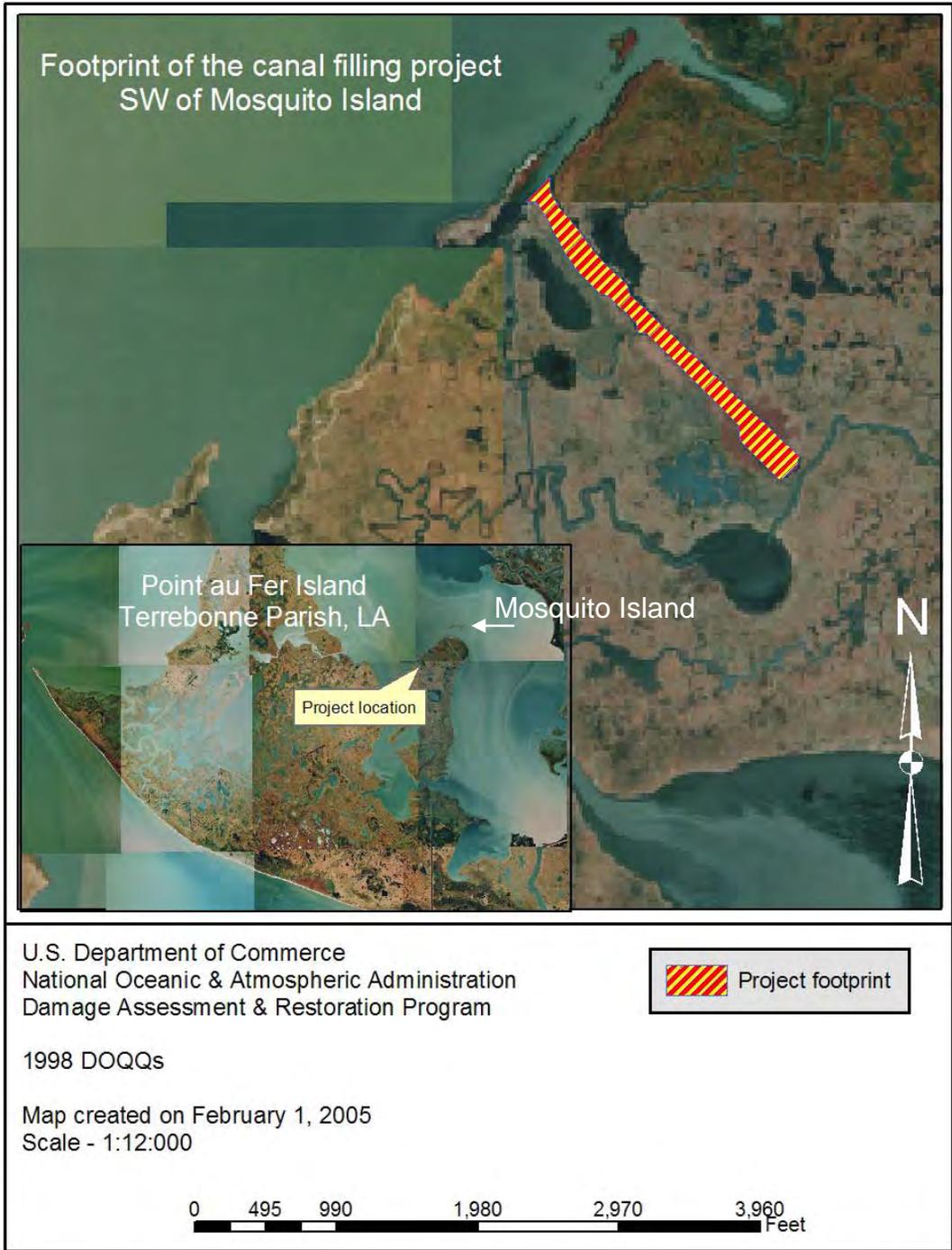
To determine the appropriate estimate for the *relative productivity* input parameter, the Trustees relied on information in the scientific literature regarding levels of functional equivalency in herbaceous marshes throughout a project's life for primary productivity, soil development, nutrient cycling, food chain support, and fish and shellfish production (Broome 1990; Broome *et al.* 1986; Cammen 1975; Craft *et al.* 1988; Craft *et al.* 1999; Currin *et al.* 1996; Langis *et al.* 1991; LaSalle *et al.* 1991; Levin *et al.* 1996; Lindau and Hossner 1981; Minello 1997; Minello and Webb 1997; Moy and Levin 1991; Peck *et al.* 1994; Scatolini and Zedler 1996; Seneca *et al.* 1985; Thompson *et al.* 1995). To determine project lifespan, the Trustees relied on subsidence data published in Coast 2050: Toward a Sustainable Coastal Louisiana (LA Coastal Wetlands Conservation and Restoration Task Force and the Wetlands Conservation and Restoration Authority 1998).

Using this information, the Trustees determined the services provided (as a percent of a fully functioning marsh) to be 50 percent in 5 years. After year 5, the services will plateau at 50 percent through the remaining portion of the project lifespan. At the end of the project life, services will revert back to 0 percent because there is a high likelihood that the site will disappear due to the effects of subsidence and erosion. Additionally, the Trustees assumed that the marsh would be completed in 2005, with a project life span of 15 years. Based on these inputs and assuming a three percent annual discount rate, each acre of created brackish marsh provides a credit of 4.75 DSAYs. Therefore, a created brackish marsh of 6.43 acres at the selected restoration site will provide 30.57 DSAYs of marsh service, which is the amount lost due to the incident (NOAA 2005).

**Socioeconomic and Environmental Impact** (See Section 5.7 – NEPA considerations)

## Evaluation

This project meets the evaluation criteria discussed in Section 5.2. Creation of a brackish marsh will compensate for interim losses of marsh (in-kind restoration) and in the same geographic vicinity of the incident (in-place). This site was also selected because of its likelihood of success, cost-effectiveness relative to the other alternatives analyzed, and its ability to provide services to numerous resources (*e.g.*, birds and wildlife). Other than the inherent risk to workers, there is no significant risk to human health and safety.



**Figure 5.1 Location of the selected project to create a brackish marsh on Point Au Fer Island, Terrebonne Parish, LA.**

## 5.6 NON-SELECTED ALTERNATIVES

The Trustees considered a number of restoration alternatives (Section 5.3, Table 5.1) to replace ecological losses resulting from the incident. Projects considered further, but not selected for implementation, are listed in this section. While many of these non-selected restoration alternatives were expected to be beneficial, the Trustees ultimately concluded that either the alternative did not meet one or more of the evaluation criteria discussed in Section 5.2, or better alternatives existed. Alternatives considered, but not selected, include:

- **Canal filling along southeastern Mosquito Bay:** This project would create approximately 6.25 acres of marsh through the placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.

**Environmental and Socioeconomic Impacts:** There would be minor environmental impacts associated with dredging and then depositing the dredged material. These impacts would primarily be in the borrow and fill areas, although an increase in turbidity would affect water quality for a short period of time. It would not be expected to have significant adverse socioeconomic impacts.

**Evaluation:** Although this project is in close proximity to the area affected by the discharge, and the dredge and fill technology proposed for implementing this alternative is technically feasible and capable of providing multiple benefits, it will not generate enough DSAY credits to satisfy the RP's liability. Had it been adequate in size, the alternative would not adversely impact ecologically valuable habitat, and would not affect public health or safety.

- **Canal filling along eastern Mosquito Bay:** This project would create approximately 13.5 acres of marsh through placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.

**Environmental and Socioeconomic Impacts:** There would be minor environmental impacts associated with dredging and then depositing the dredged material. These impacts would primarily be in the borrow and fill areas, although an increase in turbidity would affect water quality for a short period of time. It would not be expected to have significant adverse socioeconomic impacts.

**Evaluation:** Although this project is in close proximity to the area affected by the discharge, and the dredge and fill technology proposed for implementing this alternative is technically feasible and capable of providing multiple benefits, it could

be scaled to generate excessive DSAY credits compared to other equally viable alternatives. Therefore, it is more practical to prefer a project that provides an appropriate number of DSAY's than to scale down a larger project; thereby, eliminating it from future consideration when greater compensation may be needed. Had it been smaller in size, and therefore selected, the alternative would not adversely impact ecologically valuable habitat, and would not affect public health or safety.

- **Grand Bayou Blue Dredge and Fill:** This project entails plugging several breaches in the levee/ridge along Grand Bayou Blue. Following plugging of the breaches, sediments dredged from Grand Bayou Blue will be deposited into an approximately 100 acre area to create marsh.

**Environmental and Socioeconomic Impacts:** There would be minor environmental impacts associated with dredging and then depositing the dredged material. These impacts would primarily be in the borrow and fill areas, although an increase in turbidity would affect water quality for a short period of time. It would not be expected to have significant adverse socioeconomic impacts.

**Evaluation:** Although the dredge and fill technology proposed for implementing this alternative is technically feasible and capable of providing multiple benefits, it could be scaled to generate excessive DSAY credits compared to other equally viable alternatives. Therefore, it is more practical to prefer a project that provides an appropriate number of DSAY's than to scale down a larger project; thereby, eliminating it from future consideration when greater compensation may be needed. Additionally, other alternatives in close proximity to the area affected by the discharge exist. Had it been smaller in size, closer to the injured area, and therefore selected, the alternative would not adversely impact ecologically valuable habitat, and would not affect public health or safety.

- **Point Au Chiene WMA marsh creation project:** This project entails constructing 2,000 to 3,000 feet of earthen containment within the Point Au Chiene WMA. Following construction of the containment, sediment will be dredged from within the WMA and deposited to create approximately 100 acres of marsh.

**Environmental and Socioeconomic Impacts:** There would be minor environmental impacts associated with dredging and then depositing the dredged material. These impacts would primarily be in the borrow and fill areas, although an increase in turbidity would affect water quality for a short period of time. It would not be expected to have significant adverse socioeconomic impacts.

**Evaluation:** Although the dredge and fill technology proposed for implementing this alternative is technically feasible and capable of providing multiple benefits, it could be scaled to generate excessive DSAY credits compared to other equally viable alternatives. Therefore, it is more practical to prefer a project that provides an appropriate number of DSAY's than to scale down a larger project; thereby,

eliminating it from future consideration when greater compensation may be needed. Additionally, other alternatives in close proximity to the area affected by the discharge exist. Had it been smaller in size, closer to the injured area, and therefore selected, the alternative would not adversely impact ecologically valuable habitat, and would not affect public health or safety.

## **5.7 NEPA CONSIDERATIONS**

The Trustees analyzed the potential effects of the selected project on the quality of the human environment to comply with the requirements of the NEPA. The NEPA's implementing regulations direct federal agencies to evaluate the potential significance of selected actions by considering both context and intensity. For the selected action identified in this Final DARP/EA, the appropriate context for considering potential significance of the action is local, as opposed to national or worldwide.

With respect to evaluating the intensity of the impacts of the selected action, the NEPA regulations (40 C.F.R. §1508.27) suggest consideration of ten factors:

- Likely impacts of the selected projects;
- Likely effects of the projects on public health and safety;
- Unique characteristics of the geographic area in which the projects are to be implemented;
- Controversial aspects of the project or its likely effects on the human environment;
- Degree to which possible effects of implementing the project are highly uncertain or involve unknown risks;
- Precedential effect of the project on future actions that may significantly affect the human environment;
- Possible significance of cumulative impacts from implementing this and other similar projects;
- Effects of the project on National Historic Places, or likely impacts to significant cultural, scientific, or historic resources;
- Degree to which the project may adversely affect endangered or threatened species or their critical habitat; and
- Likely violations of environmental protection laws.

### **5.7.1 Likely Impacts of the Selected Alternative**

Marsh creation would generally benefit the Point Au Fer Island ecosystem by providing increased nursery, foraging, and cover habitat for numerous species of nekton that utilize the marsh fringe. Increased habitat will also provide areas for birds and other wildlife species to nest, forage, and seek protection. Aesthetic and recreational benefits will be extended to humans using the area. As proposed, the selected alternative would also benefit the currently degraded brackish marshes in the area by restoring landscape continuity and improving hydrology, to name a couple.

### 5.7.2 Effects on Public Health and Safety

The Trustees evaluated the potential for the selected project to impact public health and safety by considering the following: air and noise pollution, water use and quality, geological resources, soils, topography, environmental justice, energy resources, recreation, traffic, and contaminants.

*Air Quality:* Minor temporary adverse impacts would result from the proposed construction activities. Exhaust emissions with airborne pollutants from dredging equipment and/or service boats should be quickly dissipated by prevailing winds and would be limited to the construction phase of the project. There would be no long-term adverse impacts to air quality.

*Noise:* Short-term adverse impacts, limited to the construction phase, include increased noise associated with supply boats and dredging machinery. There would be no long-term adverse impacts.

*Water quality:* There would be no change in surface water resources without the project. Dredging, either for access or mining and placement of sediments, whether adjacent to the site or for marsh creation and nourishment, would increase turbidity in Four League Bay and the adjacent marshes during the period of construction. After construction is completed, however, the sediments in the disposal area will de-water and will be planted with native vegetation. Vegetation should aid in the retention of sediments within the marsh complex as well as trap sediments that pass over the marsh during high water events; thereby, improving local water quality over the long-term.

*Geology:* Geology of the area would not be affected either with or without the project.

*Environmental Justice:* Executive Order 12898 (Environmental Justice) requires “to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low income populations...”. The selected project has been reviewed for compliance with this order and it has been determined that it would not adversely affect the health or environment of the human population regardless of race or economic status.

*Energy:* Without the project, erosion of this portion of Point Au Fer Island could expose pipelines and flowlines near the project area to increased tidal action. This project should help maintain marsh in the area for a longer period; thereby, providing limited protection to adjacent buried pipelines in oil and gas fields near the project area. There would be no long-term adverse impacts to infrastructure.

*Recreation:* Some temporary adverse short-term impacts to recreation would occur (i.e., increased turbidity of surface water) as a result of dredging activity. However, the long-

term impact of additional wetlands far out-weighs any negative impacts. These long-term impacts would provide continued opportunities for sport fishers and hunters.

*Traffic:* There will be no short- or long-term adverse impacts to traffic in the area due to construction activities or the project. Four League Bay itself is large and boats can easily maneuver in around the construction zone. Additionally, there are many access routes to the northeastern portion of Point Au Fer Island, therefore, all areas can be accessed during construction and following demobilization of equipment.

*Contaminants:* After a search of records indicating suspected contamination of sediments, it was concluded that no suspected sources of contaminants are in the area. Therefore, dredging operations are not likely to release levels of contaminants into the human environment.

### **5.7.3 Unique Characteristics of the Geographic Area**

Due to the construction of the selected project, adjacent wetlands may experience increased sedimentation. However, any impacts of this nature are expected to be beneficial since sedimentation of the wetlands will provide nutrients important for plant growth and a potential maintenance in elevation. Both are important in coastal Louisiana due to land loss in the area resulting from subsidence and erosion. The Trustees feel the selected project will enhance the unique characteristics of this region.

### **5.7.4 Controversial Aspects of the Project or its Effects**

The Trustees evaluated the selected project, and its effects on the quality of the human environment, for the potential to be highly controversial by considering the following: effects on historic sites, ecological, aesthetic, cultural resource, social, and economic effects. There may be temporary aesthetic impacts during implementation of the selected project due to the presence of heavy equipment. Once construction is complete, the aesthetic impacts will cease. Beneficial impacts will be extended to the users of the project area. Overall, the Trustees do not expect the selected project to have any potential for public controversy.

### **5.7.5 Uncertain Effects or Unknown Risks**

The Trustees do not believe there are uncertain effects or unknown risks to the human environment associated with implementing the selected project. The Trustees would conduct a thorough site survey and engineering analysis to address any significant uncertainties before implementing the selected alternative.

### **5.7.6 Precedential Effects of Implementing the Project**

The Trustees have pursued wetland restoration projects to compensate for other natural resource damages claims in Louisiana. Wetland restoration and creation projects are regularly implemented along the Louisiana coast to address erosion, subsidence, and sea-

level rise, and compensatory issues. The selected project, therefore, sets no precedents for future actions of a type that would significantly affect the quality of the human environment.

#### **5.7.7 Possible, Significant Cumulative Impacts**

The selected project is not expected to have a significant cumulative effect on the human environment since it alone, or coupled with others, should not change the pattern of hydrologic discharge, boat traffic, economic change, or land-use change in the area.

#### **5.7.8 Effects on National Historic Sites or Nationally Significant Cultural, Scientific or Historic Resources**

Following a review of the maps on file at the Louisiana Department of Culture, Recreation, and Tourism, the Trustees determined that no recorded sites or Traditional Cultural Properties exist in the vicinity of the selected project. Letters were sent to the State Historic Preservation Officer and the Chitimacha Tribe requesting concurrence with the determination that this selected project will not adversely affect any areas of cultural significance or registered historic places.

#### **5.7.9 Effects on Endangered or Threatened Species**

Because the selected primary restoration alternative is the no action/natural recovery alternative, it is not likely to adversely affect Federally-listed threatened or endangered species, or their designated critical habitat.

The selected compensatory alternative is the creation of a brackish marsh using sediments hydraulically dredged from Four League Bay near Point Au Fer Island.

##### **West Indian manatee (*Trichechus manatus*)**

The activities associated with the selected project are not likely to adversely affect the West Indian manatee since construction of the selected alternative will take place in either fall or winter (*i.e.*, outside of the summer months). In the event dredging activities are re-scheduled to take place during the summer months, the Trustees will seek further consultation with the USFWS, and ensure that personnel are present on the dredge to monitor for the presence of West Indian manatees.

##### **Brown pelican (*Pelecanus occidentalis*)**

There are currently no known pelican nesting colonies within the project area of the selected restoration alternative; however, undocumented nesting colonies may be present that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Since a current survey indicating the location of newly established nesting colonies does not exist, the Trustees will instruct

Transco to have a qualified wildlife biologist survey the proposed construction area of the selected restoration project alternative for the presence of undocumented nesting colonies during the nesting season (April 1 through September 14). Regardless of whether a rookery should be found within 2,000 feet of the proposed construction area, restoration activities will be scheduled during the non-nesting period (September 15 – March 31). Given the precautionary step to survey the area for rookeries, and the anticipated construction window, the activities associated with this action are not likely to adversely affect the brown pelican.

### **Piping plover** (*Charadrius melodus*)

Piping plover are known to winter on Point Au Fer Island, but have little potential to be directly affected by the restoration project, noise from construction, or related disturbances, because they are primarily concentrated in the southwest portion of the island. The selected project will be constructed in the northeast portion of island.

Additionally, as mentioned above, the piping plover feeds 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. Given these preferred characteristics, and the fact that the dredged material disposal area is currently open water as is the adjacent bay, the resulting brackish marsh is not anticipated to adversely affect the piping plover or its critical habitat.

### **Kemp's Ridley sea turtle** (*Lepidochelys kempii*)

Although the northern Gulf of Mexico is within the range of five species of sea turtles, the Kemp's ridley (*Lepidochelys kempii*), which is a federally-listed endangered species, is the only one that may frequent the area. Dundee and Rossman (1989) report that Kemp's ridley sea turtles occasionally appear along the Louisiana Gulf coast. Possible factors related to this occurrence include the widespread availability of shallow-water marine and estuarine habitat with high turbidity levels from proximity to the Mississippi and Atchafalaya Rivers (Frazier, 1980). Point Au Fer Island marshes and open water areas may serve as foraging and development sites for the Kemp's ridley.

To determine the extent to which another project, Point Au Fer Island Hydrologic Restoration project (Coastal Wetlands Planning, Protection, and Restoration Act [CWPPRA] Project PTE 22/24), would affect the Kemp's ridley, literature documenting known occurrences within NMFS statistical zones along the Louisiana coast was examined and summarized in the environmental assessment (U.S. Department of Commerce 1995). That assessment stated "no unusually high incidences of occurrence were noted in NMFS Statistical Zone 15 in general, or at Point Au Fer specifically." Since this project is located north of that project, and in more inland waters and marshes than the earlier project, there is less likelihood of Kemp's ridley sea turtles utilizing this area. Therefore, the construction of the project, and the marsh that will result, are not likely to adversely affect Kemp's ridley sea turtles.

## **Other sea turtles**

Of the other four species of endangered or threatened sea turtles, the green turtle, and the loggerhead are relatively common in the nearshore waters of the Gulf of Mexico. The hawksbill turtle is uncommon in nearshore waters and the leatherback turtle is found in open waters of the Gulf. None of these are expected in this project area; therefore, the construction of the project, and the marsh that will result, are not likely to adversely affect these sea turtles.

An informal ESA consultation was initiated with USFWS and NMFS on April 26, 2005, and April 27, 2005, respectively. Correspondence from USFWS personnel and NMFS personnel (Appendix E) dated June 1, 2005, and May 4, 2005, concurred with the Trustees determination of not likely to adversely affect.

### **5.7.9.1 Likely Impacts of the Selected Alternative on Essential Fish Habitat**

During the construction phase of this project, some short-term and localized adverse impacts will occur. These impacts include the impingement of slow-moving fishes and benthic organisms during dredging. Resuspension of the sediment will have localized impacts to fish and filter feeders causing gill clogging, increased mucus production and potential smothering of the organisms located in the fill area. Sedimentation will smother sessile, benthic prey located near the construction area.

During the dredging phase there will be localized increases in turbidity and sedimentation near the designated dredge and fill sites. As in the construction phase, sessile organisms would be smothered either through clogged gills or buried by sediments. Mobile fish and invertebrates would most likely leave the immediate area but would return upon project completion.

Increased noise levels due to dredging would also cause mobile fish to flee the area but return once operations end.

Positive impacts to EFH would include reestablishing marsh habitat and providing continuity and access to marsh currently bordered by spoil banks. The areas of marsh serve as habitat for prey species of some of the managed fish as well as provide a nursery for the larvae and juvenile stages of many managed species.

An informal EFH consultation was initiated with NMFS on April 26, 2005. Correspondence from NMFS personnel (Appendix E) dated May 6, 2005, stated that the potential impacts of the project on EFH and marine fishery resources was adequately described, and as such, suggested no revisions to the document. It was requested, however, that the Trustees closely coordinate with staff of the Baton Rouge NMFS office as detailed planning of the project continues.

#### **5.7.10 Violation of Environmental Protection Laws**

The selected alternative can be implemented in compliance with all applicable environmental laws (Appendix C). Therefore, the Trustees do not anticipate any violation of federal, state or local laws, designed to protect the environment.

#### **5.7.11 Conclusion of the NEPA Analysis**

The Trustees believe that the project selected in this restoration program will not cause significant adverse impacts to the human environment. Further, the Trustees do not believe the selected project will affect the human environment in ways deemed “significant.”

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## ACRONYMS:

AR	Administrative Record
CEQ	Council on Environmental Quality
CWA	Clean Water Act
CWPPRA	Coastal Wetlands Planning, Protection, and Restoration Act
CZMA	Coastal Zone Management Act
DARP/EA	Damage Assessment and Restoration Plan/ Environmental Assessment
DOQQ	Digital Ortho-quarter-quad
DSAY	Discounted Service Acre-Year
EA	Environmental Assessment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
HEA	Habitat Equivalency Analysis
LA	Louisiana
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LNHP	Louisiana Natural Heritage Program
LOSCO	Louisiana Oil Spill Coordinator's Office, Office of the Governor
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service (NOAA)
NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
OPA	Oil Pollution Act
OSPRA	Oil Spill Prevention and Response Act (Louisiana)
PPT	Parts per thousand
RP	Responsible Party
SHPO	State Historic Preservation Officer
TPH	Total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WMA	Wildlife Management Area

## **APPENDICES:**

### **APPENDIX A. ADMINISTRATIVE RECORD INDEX FOR THE MOSQUITO BAY INCIDENT.**

## **MOSQUITO BAY NRDA CASE**

**LA2001\_0405\_1002**

Last Updated 10/05/05

### **1. Case File Index**

- 1.1. Sign in/Sign out sheet
- 1.2. Internal file structure
- 1.3. Index of AR contents

### **2. Case Administration, Laws, and Regulations**

- 2.1. Oil Pollution Act of 1990 (OPA, 1990). 1/23/1990
- 2.2. Louisiana Oil Spill Prevention and Response Act of 1991 (OSPRA, Amended 2003)
- 2.3. NRDA- One Page LOSCO Handout

### **3. Legal Notices**

- 3.1. Notice of Intent to Conduct Restoration Planning.
  - 3.1.1. Published in the State Register – 11/20/02
  - 3.1.2. Published in the Baton Rouge Advocate – 11/21/02
  - 3.1.3. Published in the Houma Daily Courier – 11/15/02
- 3.2. Notice of Availability of Draft DARP/EA and request for Public Comments
  - 3.2.1. Published in the State Register – 07/20/05
  - 3.2.2. Published in the Baton Rouge Advocate – 07/20/05
  - 3.2.3. Published in the Houma Daily Courier – 07/19/05

### **4. Response Phase Information**

- 4.1. National Response Center Incident Report: NRC #561893
- 4.2. Louisiana State Police Incident Form #01-01963
- 4.3. Insitu Burn Report to RRT6 from Charlie Henry
- 4.4. Response photo CD
- 4.5. Monitoring of In-Situ Burn reports
  - 4.5.1. August 2001
  - 4.5.2. November 2001
  - 4.5.3. October 2002

### **5. NRDA Pre-assessment Phase**

- 5.1. Materne Report dated 09/09/02 and cover letter from Denechaud and Denechaud to Gina Muhs Saizan dated 09/13/02
- 5.2. Letter to Arch Diocese of New Orleans from Gina Muhs Saizan dated 07/09/02 and requesting comments on primary restoration alternative

- 5.3. Report of Results of Plume Delineation Activities Natural Gas Condensate Accidental Release at Mosquito Bay, Point au Fer Island by CEI dated October 11, 2001 and cover letter dated 07/16/02 from Denechud and Denechaud to Gina Muhs Saizan in response to 07/09/02 letter
- 5.4. Letter of invitation to the Responsible Party to participate in the Natural Resource Damage Assessment for the Mosquito Bay incident dated 09/19/02
- 5.5. Letter from the RP accepting the invitation to participate in the Natural Resource Damage Assessment dated 10/10/02
- 5.6. 2/05/03 Meeting Summary Letter to Sam Reed dated 04/10/03
- 5.7. Letter to Mr. Comeaux from Terry Howey dated 06/04/03

## **6. Injury Assessment**

- 6.1. Letter to Sam Reed from Kate Wheelock dated 10/14/03 with Williams' comments to AR memo attached
- 6.2. Injury Assessment Memo to AR from Kate Wheelock dated 06/04/03
  - 6.2.1. Final Injury Assessment Memo to the AR from John Rapp dated 03/07/05
- 6.3. 02/04/04 RP/Trustee Meeting Summary Memo from David Marschall to Trustees dated 03/04/04
- 6.4. 12/09/04 RP/Trustee Meeting Summary Letter to Larry Thummel from Gina Muhs Saizan dated 05/10/05
  - 6.4.1. 12/09/04 Meeting Handout - Letter from Larry Thummel to Gina Muhs Saizan dated 12/09/04 regarding comments to HEA memo dated 08/29/03
  - 6.4.2. 12/09/04 Meeting Handout - Transco's edits to the 08/29/03 HEA memo
  - 6.4.3. 12/09/04 Meeting Handout - Analysis of impact of burning 93 acres of marsh containing no condensate

## **7. Restoration Planning**

- 7.1. Project Solicitation
  - 7.1.1. Letter to GSE Associates from John Rapp requesting projects/ideas dated March 23, 2004
  - 7.1.2. Letter to Brian Kendrick (Morris P. Hebert) from John Rapp requesting projects/ideas dated March 23, 2004
  - 7.1.3. Letter to T. Baker Smith and Son, Inc. from John Rapp requesting projects/ideas dated March 23, 2004
  - 7.1.4. Letter to Byron Talbot Environmental from John Rapp requesting projects/ideas dated March 23, 2004
  - 7.1.5. Letter to Terrebonne Parish CZM from John Rapp requesting projects/ideas dated March 23, 2004
- 7.2. Determinations/Consultations
  - 7.2.1. Letter to David Bernhart (NMFS) from John Rapp requesting a list of Threatened and Endangered species, and designated critical habitat, in the vicinity of the proposed project dated 01/04/05
  - 7.2.2. Letter from Teletha Griffin with enclosed list of threatened and endangered species under NMFS jurisdiction dated 01/20/05

- 7.2.3. Letter to Deborah Fuller (USFWS) from John Rapp requesting a list of Threatened and Endangered species, and designated critical habitat, in the vicinity of the proposed project dated 01/04/05.
- 7.2.4. Letter from Ronald Paille regarding the threatened and endangered species under USFWS jurisdiction in the vicinity of the proposed project dated 01/25/05
- 7.2.5. Letter to Rickey Ruebsamen (NMFS) from John Rapp regarding EFH dated 4/26/05
- 7.2.6. Letter from Richard Hartman for Miles Croom concurring with the Trustees EFH determination dated 05/06/05
- 7.2.7. Letter to Russell Watson from John Rapp regarding ESA dated 04/26/05
- 7.2.8. Letter from James Boggs concurring with the Trustees ESA determination dated 06/01/05
- 7.2.9. Letter to Eric Hawk from John Rapp regarding ESA dated 04/27/05
- 7.2.10. Letter from David Bernhart concurring with the Trustees ESA determination dated 05/04/05
- 7.2.11. Letter to Pamela Breaux (SHPO) from John Rapp regarding Cultural Resources dated 04/26/05
- 7.2.12. Letter from Pamela Breaux concurring with the Trustees Section 106 determination dated 05/17/05
- 7.2.13. Letter to Kimberly Walden (Chitimacha Tribe of Louisiana) regarding Traditional Cultural Properties dated 04/27/05
- 7.2.14. Letter from Kimberly Walden, Director of the Cultural Department of the Chitimacha Tribe of Louisiana concurring that no known archaeological sites or Traditional Cultural Properties are in the vicinity of the proposed project.
- 7.3. Restoration Plan
  - 7.3.1. 07/18/05 Draft Damage Assessment and Restoration Plan/Environmental Assessment

## **8. Restoration Implementation**

## **9. Public Outreach and Involvement**

**APPENDIX B. SUMMARY OF PUBLIC COMMENTS TO THE MOSQUITO BAY DRAFT DARP/EA.**

No comments were received during the public comment period, which ended on August 22, 2005

## **APPENDIX C. COMPLIANCE WITH KEY STATUTES, REGULATIONS, AND POLICIES.**

### **Oil Pollution Act of 1990 (OPA), 33 U.S.C. §§2701, et seq., 15 C.F.R. Part 990**

The OPA establishes a liability regime for oil spills that injure or probably will injure natural resources and/or the services that those resources provide to the ecosystem or humans. The OPA provides a framework for conducting sound natural resource damage assessments that achieve restoration. The process emphasizes both public involvement and participation by the RPs. The Trustees have conducted this assessment in accordance with the OPA regulations.

### **Louisiana Oil Spill Prevention and Response Act (OSPRA), L.R.S. 30:2451, et seq., LAC 43:XXIX.101 et seq.**

OSPRA is the principal State statute that authorizes the State agencies to act as natural resource trustees for the recovery of damages for injuries resulting from oil spill incidents in Louisiana. The Trustees have followed the regulations in this assessment.

### **National Environmental Policy Act (NEPA), 42 U.S.C. §§4321, et seq., 40 C.F.R. Parts 1500-1508**

Since the activities associated with construction of the selected alternative would be a major federal action, NOAA, as the lead federal agency, must comply with requirements set forth under NEPA, in accordance with the regulations of the Council on Environmental Quality (CEQ) for implementation of NEPA (Title 40 Code of Federal Regulations [CFR] parts 1500 through 1508) and NOAA Administrative Order (NAO) 216-6, which describes NOAA's policies, requirements, and procedures for complying with NEPA and the implementing regulations. As directed under NEPA and in accordance with the regulations of the CEQ, NOAA, in conjunction with the other federal and state agencies, prepared this Environmental Assessment (EA) as part of the Damage Assessment and Restoration Plan/Environmental Assessment (DARP/EA). This EA evaluated the effects of implementing the selected restoration project on the natural and man-made environment and concluded that there is no significant effect on either; therefore, a Finding of No Significant Impact (FONSI) will be written. Once signed, it will be appended to this Final DARP/EA.

### **Clean Water Act (CWA), 33 U.S.C. §§1251, et seq.**

The CWA is the principal law governing pollution control and water quality of the nation's waterways. Section 404 of the law authorizes a permit program for the beneficial uses of dredged or fill material in navigable waters. The U.S. Army Corps of Engineers (USACE) administers the program. In general, restoration projects, which move significant amounts of material into or out of waters or wetlands—for example, hydrologic restoration or creation of tidal marshes—require 404 permits. Under section 401 of the CWA, restoration projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards. All necessary 404 permits will be obtained for the selected project.

**Rivers and Harbors Act, 33 U.S.C. §§401, et seq.**

The Rivers and Harbors Act regulates development and use of the nation's navigable waterways. Section 10 of the Act prohibits unauthorized obstruction or alteration of navigable waters and vests the USACE with authority to regulate discharges of fill and other materials into such waters. Restoration actions that comply with the substantive requirements of Section 404 of the CWA will also comply with the substantive requirements of Section 10 of the Rivers and Harbors Act.

**Coastal Zone Management Act (CZMA), 16 U.S.C. §§1451, et seq., 15 C.F.R. Part 923**

The goal of the CZMA is to preserve, protect, develop and, where possible, restore and enhance the nation's coastal resources. The federal government provides grants to states with federally approved coastal management programs. Section 1456 of the CZMA requires that any federal action inside or outside of the coastal zone shall be consistent, to the maximum extent practicable, with the enforceable policies of approved state management programs. No federal license or permit may be granted without giving the state the opportunity to concur that the project is consistent with the state's coastal policies. The regulations outline the consistency procedures that will be followed by the Trustees. The Trustees believe that the restoration project selected for implementation will be consistent with the Louisiana CZMA program, and will seek concurrence from the state.

**Endangered Species Act (ESA), 16 U.S.C. §§1531, et. seq., 50 C.F.R. Parts 17, 222, 224**

The ESA requires all federal agencies to conserve endangered and threatened species and their habitats to the extent their authority allows. Under the Act, the Department of Commerce through NOAA and the Department of the Interior through the United States Fish and Wildlife Service (USFWS) publish lists of endangered and threatened species. Section 7 of the Act requires that federal agencies consult with these departments to minimize the effects of federal actions on endangered and threatened species.

The Trustees determined that the selected restoration action described in this Final DARP/EA is not likely to adversely impact any species listed as threatened or endangered, or their critical habitats, under the ESA. The Trustees initiated an informal consultation with the USFWS and NOAA's National Marine Fisheries Service (NMFS) on April 26, 2005, and April 27, 2005, respectively, pursuant to the ESA to ensure that the selected restoration action is in accordance with all applicable provisions. Additionally, comments on, and/or concurrence with, the Trustees determination was requested through the letters referenced above. Concurrence with our determination that the selected project is not likely to adversely affect listed species was received from the USFWS and NMFS on June 1, 2005, and May 4, 2005, respectively, and is included in Appendix E of this Final DARP/EA, as well as the administrative record.

**Fish and Wildlife Conservation Act, 16 U.S.C. §§2901, et seq.**

The selected restoration project will either encourage the conservation of non-game fish and wildlife, or have no adverse effect.

**Fish and Wildlife Coordination Act (FWCA), 16 U.S.C. 661, et seq.**

The FWCA requires that Federal agencies consult with the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and state wildlife agencies for activities that affect, control, or modify waters of any stream or bodies of water, in order to minimize the adverse impacts of such actions on fish and wildlife resources and habitat. This consultation is generally incorporated into the process of complying with Section 404 of the Clean Water Act, the NEPA or other federal permit, license, or review requirements. The selected restoration project will have either a positive effect on fish and wildlife resources or no effect. Coordination between NOAA National Marine Fisheries Service and the U.S. Fish and Wildlife Service took place concurrently with the ESA Section 7 consultation.

**Magnuson-Stevens Fishery Conservation and Management Act, as amended and reauthorized by the Sustainable Fisheries Act (Public Law 104-297) (Magnuson-Stevens Act), 16 U.S.C. §§1801 et seq.**

The Magnuson-Stevens Act provides for the conservation and management of the Nation's fishery resources within the Exclusive Economic Zone (from the seaward boundary of every state to 200 miles from that baseline). The resource management goal is to achieve and maintain the optimum yield from U.S. marine fisheries. The Act also established a program to promote the protection of Essential Fish Habitat (EFH) in the review of projects conducted under federal permits, licenses, or other authorities that affect or have the potential to affect such habitat. After EFH has been described and identified in fishery management plans by the regional fishery management councils, Federal agencies are obligated to consult with the Secretary of Commerce with respect to any action authorized, funded, or undertaken, or proposed to be authorized, funded, or undertaken by such agency that may adversely affect any EFH.

The Trustees do not believe that the selected restoration alternative will have a net adverse impact on Essential Fish Habitat as designated under the Act, and a determination of this finding was made with NMFS on April 26, 2005. Correspondence from NMFS personnel dated May 6, 2005, concurred with our determination and stated that the potential impacts of the project on EFH and marine fishery resources was adequately described, and as such, suggested no revisions to the document. It was requested, however, that the Trustees closely coordinate with staff of the Baton Rouge NMFS office as detailed planning of the project continues. The above-referenced correspondence is included in Appendix E of this Final DARP/EA, as well as the administrative record.

**Marine Mammal Protection Act, 16 U.S.C. §§1361 et seq.**

The Marine Mammal Protection Act provides for long-term management and research programs for marine mammals. It places a moratorium on the taking and importing of marine mammals and marine mammal products, with limited exceptions. The Department of Commerce is responsible for whales, porpoise, seals, and sea lions. The

Department of the Interior is responsible for all other marine mammals. The selected restoration project will not have an adverse effect on marine mammals.

**Migratory Bird Conservation Act, 126 U.S.C. §§715 et seq.**

The selected restoration project will have no adverse effects on migratory birds. Migratory birds are expected to benefit from creation of new marsh habitat.

**The National Historic Preservation Act of 1966 (NHPA), 16 U.S.C. §§470 *et seq.***

Section 106 of the NHPA requires federal agencies, or federally funded entities, to consider the impacts of their projects on historic properties. NHPA regulations require that federal agencies take the lead in this process, and outline procedures to allow the Advisory Council on Historic Preservation to comment on any proposed federal action.

Inspection of the maps and records on file at the Louisiana Department of Culture, Recreation, and Tourism – Division of Archaeology – revealed that no recorded sites exist in the vicinity of the selected project. A letter stating our findings, as well as a request for concurrence that the selected project will not adversely affect any areas of cultural significance or registered historic places, was sent to the State Historic Preservation Officer (SHPO) on April 26, 2005, and the Chitimacha Tribe of Louisiana on April 27, 2005. The Trustees determination and the SHPO's concurrence (received May 17, 2005), as well as the Chitimacha Tribe's concurrence (received May 18, 2005), is included in Appendix E of the Final DARP/EA as well as the administrative record.

**Executive Order 11990 (42 FR 26,961) - Protection of Wetlands**

On May 24, 1977, President Carter issued Executive Order 11990, Protection of Wetlands. This Executive Order requires each federal agency to take action to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities for: acquiring, managing, and disposing of federal lands and facilities; providing federally undertaken, financed, or assisted construction and improvements; and conducting federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities. The Trustees have concluded that the selected restoration project will meet the goals of this Executive Order.

**Executive Order 12898 (59 FR 7,629) – Environmental Justice**

On February 11, 1994, President Clinton issued Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This Executive Order requires each federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. EPA and the Council on Environmental Quality (CEQ) have emphasized the importance of incorporating environmental justice review in the analyses conducted by federal agencies under the NEPA and of developing mitigation measures that avoid disproportionate environmental effects on minority and low-income populations. The Trustees have

concluded that there are no low-income or ethnic minority communities that would be adversely affected by the selected restoration project.

**Executive Order 11514 (35 FR 4,247) - Protection and Enhancement of Environmental Quality**

An Environmental Assessment (EA) has been prepared as part of this Final DARP/EA and environmental coordination is taking place as required by the NEPA.

**Executive Order 12962 (60 FR 30,769) – Recreational Fisheries**

The selected restoration project will help ensure the protection of recreational fisheries and the services they provide. The selected project will have no adverse effects on recreational fisheries.

**Executive Order 13112 (64 FR 6,183) – Invasive Species**

The selected restoration project will not cause or promote the introduction or spread of invasive species. The location and elevation of the marsh creation project will promote colonization by native species; colonization by invasive species is unlikely.

**APPENDIX D. PRELIMINARY LIST OF RESTORATION ALTERNATIVES**

	<b>Project Name</b>	<b>Project Description</b>	<b>Sponsor Organization</b>	<b>Parish</b>
1	Repair Cuts in Bayou Chauvin Natural Levees	This project involves closure of cuts in Bayou Chauvin Natural Levee in order to help retain substrate and emergent marsh.	Terrebonne Parish/USFWS	Terrebonne
2	Vegetative Plantings North Shore of Lost Lake	This project entails planting smooth cordgrass ( <i>Spartina alterniflora</i> ) along the banks of Lost Lake with the intent to slow the erosion of low-lying marshes through the stabilization of sediments.	Terrebonne Parish/USFWS	Terrebonne
3	Plug Canals along East Bank of Bayou Terrebonne	This project entails plugging the mouth of various oil and gas access canals that have been cut through the natural levee of Bayou Terrebonne.	Terrebonne Parish/USFWS	Terrebonne
4	Rebuild Minor's Canal Weir	This project involves rebuilding Minor's Canal weir to include one or more large gated openings to increase freshwater flow and benefit tidal marshes south of the Mauvais Bois ridge. Additionally, the may restore and maintain submerged aquatic vegetation in Lake Decade and help reduce shoreline erosion along the lake shores.	Terrebonne Parish/USFWS	Terrebonne
5	Pointe Aux Chenes Hydrological Restoration	This project entails installing numerous water control structures, and repairing gaps in levees, in an impounded area immediately southwest of the Pointe Au Chien WMA.	Terrebonne Parish/USFWS	Terrebonne
6	Avoca Island Hydrologic Restoration	This project involves restoration and enhancement of estuarine inter-tidal wetlands by the installation of water control structures and levee repair to promote emergent submerged aquatic vegetation. Restoration of natural hydrology to estuarine inter-tidal wetlands will provide foraging habitat for waterfowl, shorebirds, wading birds, and other wetland dependant wildlife.	Ducks Unlimited	St. Mary
7	LDWF Marsh Creation (Pointe Au Chien WMA)	This project entails constructing 2,000 to 3,000 feet of earthen containment within the Point Au Chien WMA. Following construction of the containment, sediment will be dredged from within the WMA and deposited to create approximately 100 acres of marsh.	LDWF	Lafourche

	<b>Project Name</b>	<b>Project Description</b>	<b>Sponsor Organization</b>	<b>Parish</b>
8	Grand Bayou Blue Dredge and Fill	This project entails plugging several breaches in the levee/ridge along Grand Bayou Blue. Following plugging of the breaches, sediments dredged from Grand Bayou Blue will be deposited into an approximately 100 acre area to create marsh.	Burlington Resources, Inc.	Lafourche
9	Fanguy Marsh Creation Project	The project involves construction of approximately 1600 linear feet of containment dike and one earthen plug. An existing marsh platform and hurricane protection levee will contain the fill material dredged from a location. The project will help protect an existing hurricane protection levee and to restore hydrology back to its original condition.	Morris P. Hebert	Terrebonne
10	Bird Island Habitat	This project would enlarge and heighten Bird Island located north of Tojan Island within Southwest Pass, which birds use for nesting/roosting habitat. Marsh creation would be accomplished by hydraulically dredging material from a wide tidal channel north of Tojan Island to a height that would settle at marsh height. Dredge material would be confined by earthen containment dikes and a rock dike.	Vermilion Parish Coastal Restoration Advisory Committee	Vermilion
11	Little Vermilion Bay-Lagoons/Rookery	This project would protect the windward edge of eroding islands by pumping dredge material in Little Vermilion Bay while creating lagoons surrounded by habitat for nesting seabirds and neo-tropical bird species. Containment would be necessary to keep the dredge material in place.	Vermilion Parish Coastal Restoration Advisory Committee	Vermilion
12	Four Mile Canal/Bar Mouth	This project entails constructing a rock sill designed to reduce scouring, curb bank-line erosion, and help restore a more natural flow and aid the lower reaches of Onion Bayou and the Vermilion River; thereby, enhancing sediment trapping in the 4-mile canal and Little Vermilion Bay terracing projects. It will also be designed to enhance freshwater retention in adjacent marshes.	Vermilion Parish Coastal Restoration Advisory Committee	Vermilion
13	Lake Verret Shoreline	The project would involve suction dredging the navigation channel in Lake Verret and placing the spoil material along the bank to stabilize and create shoreline.	Assumption Parish Office of Emergency Preparedness	Assumption

	<b>Project Name</b>	<b>Project Description</b>	<b>Sponsor Organization</b>	<b>Parish</b>
14	Plumb Island Point Terracing/Hydrologic Restoration	This project involves the construction of 69,000 linear feet of earthen terraces, creation of approximately 9 acres of marsh, and construction of approximately 250 linear feet of earthen plugs at Plumb Island Point. The intent of the project is to reduce shoreline erosion, establish submerged aquatic vegetation and emergent marsh within the terraced area, encourage expanded delta development, repair breaches to the shoreline to restore lower energy hydrologic conditions within adjacent interior marshes, and enhance estuarine processes.	Crooked Bayou Hunting Club	St. Mary
15	Southwest Point Stabilization/Restoration	The project would involve armoring the shoreline to protect Southwest Point along the southern shoreline of Vermilion Bay and the northeast shoreline of Southwest Pass. This project would protect shoreline and marsh habitat.	Vermilion Parish Coastal Restoration Advisory Committee	Vermilion
16	Canal filling along SE Mosquito Bay	This project would create approximately 6.25 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.	Conestoga-Rover and Associates	Terrebonne
17	Canal filling along E. Mosquito Bay	This project would create approximately 13.5 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.	Conestoga-Rover and Associates	Terrebonne

	<b>Project Name</b>	<b>Project Description</b>	<b>Sponsor Organization</b>	<b>Parish</b>
18	Canal filling SW of Mosquito Island	This project would create approximately 7.34 acres of brackish marsh through the plugging of an abandoned dead-end oil and gas canal and placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from either Mosquito Bay or Four League Bay, and transported via slurry pipeline to the abandoned oil and gas canal. Native vegetation would be planted following de-watering of the dredged material.	Conestoga-Rover and Associates	Terrebonne
19	Shoreline Protection (using A-jacks) N of the inlet to Mosquito Bay	This project would stabilize an eroding shoreline (estimated 10-15 feet/year in vicinity of Point Au Fer Island [Connor <i>et al.</i> 2004a; Connor <i>et al.</i> 2004b]) along Four League Bay, north of the inlet to Mosquito Bay, through the placement of approximately 1,800 feet of A-jacks type shoreline armor. The project is estimated to result in a benefit of 8.06 acres over the life of the project.	Conestoga-Rover and Associates	Terrebonne
20	Shoreline Protection (using articulated concrete mats) N of the inlet to Mosquito Bay	This project would stabilize an eroding shoreline (estimated 10-15 feet/year in vicinity of Point Au Fer Island [Connor <i>et al.</i> 2004; Connor <i>et al.</i> 2004b]) along Four League Bay, north of the inlet to Mosquito Bay, through the placement of approximately 1,800 feet of articulated concrete mats adjacent to the shoreline. The project is estimated to result in a benefit of 8.06 acres over the life of the project.	Conestoga-Rover and Associates	Terrebonne
21	Canal mouth closure along SE Mosquito Bay	This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 2.52 acres of brackish marsh.	Conestoga-Rover and Associates	Terrebonne
22	Canal mouth closure along E. Mosquito Bay	This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 4.72 acres of brackish marsh.	Conestoga-Rover and Associates	Terrebonne

	<b>Project Name</b>	<b>Project Description</b>	<b>Sponsor Organization</b>	<b>Parish</b>
23	Canal mouth closure SW of Mosquito Island	This project would close the mouth of the abandoned oil and gas canal through the placement of vinyl sheetpiling and rip-rap on either side of the sheetpiling. The project is estimated to protect approximately 3.35 acres of brackish marsh.	Conestoga-Rover and Associates	Terrebonne

**APPENDIX E. CORRESPONDENCE BETWEEN USFWS, NMFS, LA SHPO AND THE  
CHITIMACHA TRIBE**



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.  
Suite 400  
Lafayette, Louisiana 70506

January 25, 2005

Mr. John Rapp  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Damage Assessment and Restoration Program  
Louisiana Business & Technology Center  
South Stadium Drive  
Baton Rouge, Louisiana 70803

Dear Mr. Rapp:

Please reference your January 4, 2005, letter requesting information regarding federally listed threatened and endangered species, as well as designated critical habitats that may occur in Terrebonne Parish, Louisiana. The National Oceanic and Atmospheric Administration's (NOAA) Damage Assessment and Restoration Program is preparing environmental documents for potential restoration projects in that Parish and more specifically on Point Au Fer Island. A December 29, 2004, letter from your office requested information regarding threatened and endangered species in Cameron and Calcasieu Parishes, Louisiana. In response to that letter, the Service provided a current Parish list of threatened and endangered species in Louisiana, as well as habitat descriptions for those species. That information is also valid for federally listed threatened and endangered species in Terrebonne Parish, Louisiana. Because your letter referenced Point Au Fer Island, the following information specific to that area is provided in accordance with the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), the Migratory Bird Treaty Act (40 Stat. 755, as amended; 16 U.S.C. 703 et seq.), and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.).

Federally listed as an endangered species, West Indian manatees (*Trichechus manatus*) occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams during the summer months (i.e., June through September). Manatees have been regularly reported in the Amite, Blind, Tchoufouche, and Tickfaw Rivers, and in canals within the adjacent coastal marshes of Louisiana. They have also been occasionally observed elsewhere along the Louisiana Gulf coast. The manatee has declined in numbers due to collisions with boats and barges, entrapment in flood control structures, poaching, habitat loss, and pollution. Cold weather and outbreaks of red tide may also adversely affect these animals. Should the proposed restoration projects involve activity in those areas during the summer months, further consultation with this office will be necessary.

Federally listed as a threatened species, the piping plover (*Charadrius melodus*), as well as its designated critical habitat, occurs along the Louisiana coast including Point Au Fer Island in Terrebonne Parish, Louisiana. 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. Plovers move among sites as environmental conditions change.

On July 10, 2001, the U.S. Fish and Wildlife Service designated critical habitat for wintering piping plovers (Federal Register Volume 66, No. 132). Their 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. Major threats to this species include the loss and degradation of habitat due to development, disturbance by humans and pets, and predation. Should the proposed restoration projects directly or indirectly affect the piping plover or its critical habitat, further consultation with this office will be necessary.

Federally listed as an endangered species, brown pelicans (*Pelecanus occidentalis*) are currently known to nest on Raccoon Point on Isles Dernieres, as well as Queen Bess Island, Plover Island (Baptiste Collette), Wine Island, Rabbit Island in Calcasieu Lake, and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur; thus, they may also be found nesting on mud lumps at the mouth of South Pass (Mississippi River Delta) and on small islands in St. Bernard Parish. 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.

There are currently no known brown pelican nesting colonies within the study area; however, undocumented nesting colonies may be present that are not currently listed in the database maintained by the Louisiana Department of Wildlife and Fisheries. That database is updated primarily by monitoring the colony sites that were previously surveyed during the 1980s. Until a new, comprehensive coast-wide survey is conducted to determine the location of newly-established nesting colonies, we recommend that a qualified biologist inspect any proposed

corresponding Public Notice. Please contact Mr. John Bruza (504/862-1288) for additional information regarding the Corps regulatory process.

We appreciate the opportunity to provide assistance during the planning stages of the proposed restoration projects. If you have any questions regarding our comments, please contact Angela C. Trahan (337/291-3137) of this office.

Sincerely,



Ronald Paille  
Acting Supervisor  
Louisiana Field Office

cc: NOAA Fisheries, St. Petersburg, FL  
Corps of Engineers, New Orleans, LA  
LDWF, Natural Heritage Program, Baton Rouge, LA  
LDWF, Region 6 Office, Opelousas, LA  
LDNR, Baton Rouge, LA



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL MARINE FISHERIES SERVICE  
Southeast Regional Office  
263 13<sup>th</sup> Avenue South  
St. Petersburg, Florida 33701

May 6, 2005

F/SER46/RH:jk  
225/389-0508

Mr. John Rapp  
Marine Resource Habitat Specialist  
Damage Assessment and Restoration Program  
NOAA Restoration Center  
LSU/LA Business and Technology Center  
South Stadium Drive  
Baton Rouge, Louisiana 70803

Dear Mr. Rapp:

NOAA's National Marine Fisheries Service (NMFS) has received **Draft Damage Assessment and Restoration Plan/Environmental Assessment (EA)** transmitted by your letter dated April 26, 2005. This EA describes a proposed project designed by the Damage Assessment and Restoration Program (DARP) to compensate for adverse impacts caused by the April 5, 2001, discharge of natural gas and natural gas condensate in the vicinity of Mosquito Bay on Point au Fer Island in Terrebonne Parish, Louisiana. According to the draft EA, the mitigation project entails pumping dredged material into an abandoned oil and gas canal southwest of Mosquito Bay to create approximately 6.5 acres of soil elevations suitable for the planting of brackish marsh vegetation.

The NMFS has reviewed the draft EA and believes that the document adequately describes the potential impacts of the project on essential fish habitat and marine fishery resources. As such, we have no revisions to the document to recommend. However, specific details as to plant spacing, initial and final disposal elevations, methods of containment at all openings in the canal spoil bank, and the restoration of fishery access after construction are missing from the document. The NMFS recommends the DARP closely coordinate those details with staff of the Baton Rouge office of the NMFS, Habitat Conservation Division, as detailed planning on this project continues.

We appreciate the opportunity to review and comment on the draft EA for this project.

Sincerely,

*for* Miles M. Croom  
Assistant Regional Administrator  
Habitat Conservation Division

cc:  
FWS, Lafayette  
EPA, Dallas  
LA DNR, Consistency  
F/SER46, Ruebsamen  
Files





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

Southeast Regional Office  
263 13<sup>th</sup> Avenue S.  
St. Petersburg, FL 33701  
(727) 570-5312, FAX 570-5517  
<http://sero.nmfs.noaa.gov>

MAY - 4 2005

F/SER3:EGH

Mr. John Rapp  
NOAA Restoration Center  
National Marine Fisheries Service  
Damage Assessment and Restoration Program  
P.O. Box 25092  
Baton Rouge, LA 70894-5092

Dear Mr. Rapp:

This correspondence responds to your letter/environmental assessment (EA) dated April 27, 2005, to NOAA's National Marine Fisheries Service (NMFS), Protected Resources Division, regarding the proposed construction of a brackish/intermediate marsh on Point Au Fer Island in Terrebonne Parish, Louisiana. You requested our review and comments on the project, and concurrence with your effects determination.

The marsh proposed for creation is compensation for ecological losses caused by the discharge of condensate oil from a natural gas pipeline leak (the Mosquito Bay incident) into brackish marsh vegetation, marsh sediments, and coastal waters. The proposed project entails hydraulically dredging portions of Four League Bay and depositing the material in an abandoned oil and gas canal near Point Au Fer Island. PRD believes your EA adequately addresses the issues associated with threatened and endangered species under NMFS' purview. We have no additional comments.

We look forward to continued cooperation with the NOAA Restoration Center in conserving our endangered and threatened resources. If you have any questions, please contact Mr. Eric Hawk, fishery biologist, at (727) 570-5779, or by e-mail at [Eric.Hawk@noaa.gov](mailto:Eric.Hawk@noaa.gov).

Sincerely,

David Bernhart  
Assistant Regional Administrator  
for Protected Resources

File: 1514-22.E. NOAA  
Ref: I/SER/2005/02179





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
 NATIONAL MARINE FISHERIES SERVICE  
 Silver Spring, MD 20910

NOAA Restoration Center  
 LSU/ LA Business & Technology Center  
 South Stadium Dr.  
 Baton Rouge, LA 70803

April 26, 2005

Pamela Breaux  
 State Historic Preservation Officer  
 c/o Rachel Watson  
 Department of Culture, Recreation and Tourism  
 Division of Archaeology  
 Post Office Box 44247  
 Baton Rouge, Louisiana 70804

Date: 5-17-05

No known archaeological sites or historic properties will be affected by this undertaking. This effect determination could change should new information come to our attention.

Pam Breaux: Pam Breaux  
 State Historic Preservation Officer

Dear Ms. Breaux:

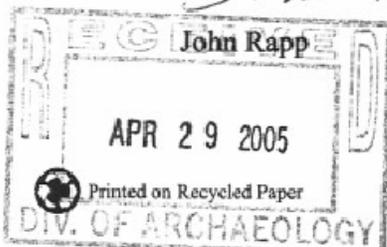
The National Oceanic and Atmospheric Administration's Restoration Center will be the lead federal agency overseeing the restoration planning, engineering and other pre-construction activities associated with the implementation of a proposed marsh creation project (Figure 1) on Point Au Fer Island in Terrebonne Parish, LA. The project would entail dredging portions of Four League Bay and depositing the material in an abandoned oil and gas canal. The coordinates of the proposed project are 676034.43 E and 3243541.99 N (UTM, NAD 83, Zone 15). This project is intended to compensate the public and environment for natural resource service losses that occurred as a result of an Oil Spill on April 5, 2001.

On January 13, 2005, the maps on file in the Division of Archeology were inspected and revealed that no recorded sites exist in the immediate vicinity of the proposed project. Therefore, we feel that this project will not adversely affect any areas of cultural significance or registered historic places. Please review the attached information and advise us of any potential concerns regarding cultural resources in the proposed project construction area that we may not have considered during the informal consultation.

Please do not hesitate to contact me at 225/578-7924 if you or your staff would like additional information regarding this matter.

Sincerely,

*John Rapp*





**CHITIMACHA**  
TRIBE OF LOUISIANA

CULTURAL DEPARTMENT

May 18, 2005

Mr. John Rapp  
U.S. Dept. of Commerce  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Silver Spring, MD 20910

Re: Proposed Marsh Creation on Point Au Fer Island  
Terrebonne Parish, Louisiana

We are in receipt of your letter, dated April 27, 2005, concerning the above-referenced project. The parish where the proposed project is to take place is part of the aboriginal Chitimacha homeland. That is, historically and prehistorically the Chitimacha Tribe of Louisiana was located in this area. This homeland contains many village sites, religious/sacred sites, and burial sites, which must be taken into account in the planning process.

Our records and oral traditions do not indicate that a specific Chitimacha archaeological site or Traditional Cultural Property is in the immediate vicinity of your project, therefore we have no objection to the implementation of the proposed activity. However, if archaeological remains representing a village site and/or burial site are discovered during the process of construction you should stop and contact the tribe and the State Historic Preservation Office immediately, in order to begin consultation regarding the encountered remains.

The Chitimacha Tribe of Louisiana appreciates your compliance with federal and state laws concerning Native American notification and consultation. Should you have any questions, do not hesitate to contact me at (337) 923-9923.

Sincerely,

Kimberly S. Walden,  
Director, Cultural Department

KW: JE

**APPENDIX F. PREPARERS, AGENCIES, AND PERSONS CONSULTED.**

**National Oceanic and Atmospheric Administration:**

Tony Penn, Damage Assessment Center, Silver Spring, MD  
Troy Baker, Damage Assessment Center, Baton Rouge, LA  
John Rapp, Restoration Center, Baton Rouge, LA  
Kate Clark, Damage Assessment Center, NE Region, Narragansett, RI  
Linda Burlington, Office of General Counsel, Silver Spring, MD  
John Iliff, Restoration Center, St. Petersburg, FL  
Ron Gouguet, Coastal Protection and Restoration Division, Seattle, WA

**U.S. Fish and Wildlife Service:**

Buddy Goatcher, Lafayette, LA

**Louisiana Oil Spill Coordinator's Office, Office of the Governor:**

Charles K. Armbruster, Baton Rouge, LA  
Gina Muhs Saizan, Baton Rouge, LA

**Louisiana Department of Natural Resources:**

Richard Stanek, Baton Rouge, LA  
Jennifer Beall, Baton Rouge, LA

**Louisiana Department of Wildlife and Fisheries:**

Terry Romaine, Baton Rouge, LA

**Louisiana Department of Environmental Quality:**

John de Mond, Baton Rouge, LA  
Chris Piehler, Baton Rouge, LA

## APPENDIX G. FINDING OF NO SIGNIFICANT IMPACT

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality regulations at 40 C.F.R. §1508.27 state that the significance of an action should be analyzed both in terms of “context” and “intensity.” Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ’s context and intensity criteria. These include:

- 1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in FMP’s? *No. As described in Section 5.7.9.1 and Appendix C, and concurred with in Appendix E, the selected marsh creation project is not expected to cause damage to essential fish habitat. Consultation with NOAA’s Fisheries Service pursuant to the Magnuson-Stevens Act ensures that the selected marsh creation project is in accordance with all applicable provisions.*
- 2) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)? *No. The selected marsh creation project is being designed to foster the establishment of native vegetation, similar hydrologic regimes as adjacent marshes, and, through time, to have similar soil characteristics as adjacent marsh. Therefore, since the selected project is being designed to fit into a locally homogenous landscape, it is not expected to have adverse or beneficial impacts on species biodiversity or ecosystem function.*
- 3) Can the proposed action be reasonably expected to have a substantial adverse impact on public health or safety? *No. As described in Section 5.7.2, no adverse impacts on public health and safety are expected.*
- 4) Can the proposed action be reasonably expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species? *No. As described in Section 5.7.9 and Appendix C, and concurred with in Appendix E, the selected marsh creation project is not expected to adversely affect endangered or threatened species. Consultation with the USFWS and NOAA’s Fisheries Service pursuant to the ESA ensures that the selected marsh creation project is in accordance with all applicable provisions.*
- 5) Are significant social or economic impacts interrelated with natural or physical environmental effects? *No. The Trustees do not expect any significant social or economic impacts. There will be minor economic impact from the project due to the employment of workers during construction; however, due to the size of the project, the selected marsh creation project will not create long-term economic stability. There are*

*no perceived social impacts, positive or negative, as Point Au Fer Island is uninhabited and frequented only by recreational hunters and fishers.*

6) To what degree are the effects on the quality of the human environment likely to be highly controversial? *No. As described in Section 5.7.4, the Trustees do not expect the selected project to have any potential for public controversy. Similar projects in the region have not been controversial.*

7) Can the proposed action be reasonably expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas? *No. As described in Section 5.7.3, the Trustees feel the selected marsh creation project will enhance the unique characteristics of this region. Cultural and historical resources are not going to be impacted by the selected restoration project. The marsh creation project is designed to enhance the Point Au Fer ecosystem, and the project location has been selected to minimize any potential negative impacts on adjacent wetlands while increasing habitat for fish and wildlife.*

8) To what degree are the effects on the human environment likely to be uncertain or involve unique or unknown risks? *No. As described in Section 5.7.5, The Trustees do not believe there are uncertain effects or unknown risks to the human environment associated with implementing the selected project. State and federal agencies have successfully implemented similar projects in this region.*

9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts? *No. As described in Section 5.7.7, the selected marsh creation project is not expected to have a significant cumulative effect on the human environment as no past, present, or foreseeable actions appear likely to have any cumulative impacts when combined with the selected action that would cause significant impacts to the human environment.*

10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources? *No. As described in Section 5.7.8, and stated and concurred with in Appendix E, the selected marsh creation project will not adversely affect any known archaeological sites or sites of cultural or scientific significance. The project is not located near any highways or structures that might be affected by project implementation.*

11) Can the proposed action be reasonably expected to result in the introduction or spread of a nonindigenous species? *No. The selected restoration project should not cause or promote the introduction or spread of invasive species. The location and elevation of the selected marsh creation project will promote colonization by native species; colonization by invasive species is unlikely.*

12) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration? *No. As stated in Section 5.7.6, the selected project, therefore, sets no precedents for future actions of a type that would significantly affect the quality of the human environment.*

13) Can the proposed action be reasonably expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment? *No. As described in Section 2.1.2, and demonstrated in Appendix C, the selected marsh creation project complies with all Federal, State, and local law requirements and is expected to enhance habitat and protect the environment.*

14) Can the proposed action be reasonably expected to result in beneficial impacts, not otherwise identified and described above? *Yes. Since the Trustees designed the project to achieve recovery of injured natural resources, the cumulative environmental consequences will be largely beneficial.*

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## **DETERMINATION**

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for the marsh creation project Southwest of Mosquito Island, it is hereby determined that this marsh creation project will not significantly impact the quality of the human environment as described above and in the Environmental Assessment. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

Date \_\_\_\_\_

\_\_\_\_\_  
William T. Hogarth  
Assistant Administrator for Fisheries  
National Marine Fisheries Service  
National Oceanic and Atmospheric Administration  
U. S. Department of Commerce