FINAL DAMAGE ASSESSMENT AND RESTORATION PLAN/ENVIRONMENTAL ASSESSMENT

for the September 22, 2002, Oil Spill at North Pass in the Mississippi River Delta, Plaquemines Parish, Louisiana

May 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 September 22, 2002, an estimated 300 barrels (12,600 gallons) of south Louisiana crude oil was discharged into the environment from an above-ground storage tank located at Ocean Energy's North Pass storage and transfer facility. Containment and cleanup operations were quickly initiated by the Responsible Party (RP) and its oil spill response contractor. However, operations were temporarily suspended due to the passing of Tropical Storm Isidore and Hurricane Lili. Under the Oil Pollution Act (OPA), two federal and four state government agencies—U.S. Department of Commerce, represented by 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—are responsible for restoring natural resources and services injured by a discharge, or a substantial threat of a discharge ("incident"). These agencies act as Trustees on behalf of the public to conduct a natural resource damage assessment to determine the nature and extent of injuries to natural resources and services and the restoration actions needed to reverse the losses resulting from this incident.

Final Plan to Restore Natural Resources:

This final Damage Assessment and Restoration Plan/Environmental Assessment (final DARP/EA) describes the injuries and restoration action selected by the Trustees to restore the losses resulting from this incident. This final DARP/EA was developed cooperatively among the Trustees and the RP.

What was injured?

- Freshwater marsh habitat – 120 acres moderately oiled

How was the restoration alternative selected?

The Trustees considered numerous natural resource restoration alternatives to compensate the public for these injuries. Each proposed project was evaluated using the following criteria from the OPA Natural Resource Damage Assessment (NRDA) regulations (15 CFR Part 990):

- 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.

Selected Restoration Alternative:

After considering potential restoration alternatives that had a nexus to coastal herbaceous wetlands, the Trustees identified nine with a strong nexus to the injured resource (fresh marsh habitat). These projects were screened based on the criteria listed in Chapter 5 of this final DARP/EA and a crevasse splay marsh creation project was selected as the preferred alternative in the draft DARP/EA (March 2005) for restoring the injured natural resources and services. This type of marsh provides a high level of service, is cost effective, and has a high likelihood of success. In addition, the created habitat is expected to have an extended longevity (compared to marsh created using dredged material) and faster colonization of the area by native vegetation because natural processes continually transport and deposit sediment and seeds on and adjacent to the marsh surface.

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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 responsible for restoring natural resources and services injured by the September 22, 2002, oil spill (the "incident") from an above-ground storage tank at the Ocean Energy Inc. – North Pass facility in Plaquemines Parish, Louisiana. At the time of the incident, the 10,000 barrel storage tank was owned by Ocean Energy, Inc. In 2003, Ocean Energy was purchased by Devon Energy Corporation. Devon Energy is taking responsibility for the costs of conducting a natural resource damage assessment, as well as the costs of implementing the Trustees' selected restoration action identified in this final DARP/EA. The purpose of restoration, as outlined in this final DARP/EA, is to make the environment and the public whole for injuries resulting from the incident by implementing restoration actions that return injured natural resources and services to baseline conditions and compensate for interim losses.

The natural resource Trustees for this incident include two federal and four state agencies: U.S. Department of Commerce, represented by 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 responsibilities for natural resources and services and their supporting ecosystems belonging to, managed by, controlled by, or appertaining to the United States of America and the State of Louisiana.

The Trustees have prepared this final DARP/EA to inform the public about injury assessment and restoration planning efforts, and sought comments on the preferred restoration alternative presented in the draft DARP/EA (March 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.

1.1 OVERVIEW OF THE INCIDENT

On September 22, 2002, at approximately 1:00 am Central daylight savings time, the U.S. Coast Guard (USCG) Marine Safety Office in New Orleans, LA was notified that a 10,000 barrel aboveground storage tank was leaking oil into the containment berm, surrounding waters and marshes of North Pass in the Mississippi River delta, Plaquemines Parish, Louisiana (Figure 1.1). The storage tank was located at a storage and transfer facility owned and operated by Ocean Energy, Inc. in Main Pass Block 69 (position 29° 12.02'N 089° 02.45'W). The bottom of the tank apparently ruptured as the result of internal corrosion, discharging south Louisiana crude oil (American Petroleum Institute gravity 28 degrees). Initial reports suggested that the total volume of oil

discharged was between 100 and 800 barrels. Though the total volume of oil released into the surrounding environment is not explicitly known (the tank was being filled when the leak began), subsequent evaluation indicated that an estimated 300 barrels (12,600 gallons) escaped the containment area and flowed into the surrounding water and marsh area.

Ocean Energy, Inc. and its oil spill response operator, Asco Environmental Services, began containment and clean-up following the September 22, 2002, incident. Initial response actions included deployment of sorbent and protective booms to limit the spread of oil and the use of skimmers to collect the discharged oil from the water surface. These actions were focused in the vicinity of the facility and in nearby bayous and trenasses. Although containment and cleanup began very shortly after the incident, operations were halted due to the passage of Tropical Storm Isidore and Hurricane Lili. The cleanup resumed on Friday, October 4, 2002, and, within one week, 637 barrels of oily water mixture had been recovered. Oil transported deep within the marsh by the storm was not recovered since additional injury to the environment would have been sustained as a result of clean-up efforts.

State and federal natural resource trustee agencies also responded to the incident. Marshes and adjacent surface waters were observed to have been exposed to oil and/ or sheen. Based on these observations and information collected immediately following the incident, the Trustees concluded that birds, fish, and other fauna, as well as their habitat, may have been exposed to crude oil. The Trustees initiated a damage assessment pursuant to Section 1006 of OPA (33 U.S.C. §2706) and OSPRA (L.R.S. 30:2451 *et seq.*), to determine the nature and extent of injuries to natural resources and services. Both Ocean Energy, Inc. and, following change of ownership, Devon Energy Corporation have been active and cooperative participants throughout this effort.

1.2 Summary of Injuries to Natural Resources

The Trustees evaluated the information gathered during, and immediately following, response activities. Marsh flora and fauna, water column and benthic organisms, and habitats were evaluated for potential injury. Surveys conducted shortly after the incident indicated that injuries to birds, fish, and other water column organisms were minimal and would be compensated by the restoration of marsh habitat for the marsh injuries.

As described in Chapter 4, the Trustees and the Responsible Party (RP) agreed to develop "reasonably conservative" assumptions. While collecting more information may increase the precision of the estimate of the impacts, the Trustees believe that the type and scale of restoration actions would not substantially change as a result of more detailed injury assessment. The Trustees and RP agreed to generate these reasonably conservative assumptions as input parameters for the injury assessment model that used the Habitat Equivalency Analysis (HEA) to relate natural resource and service losses to compensatory restoration. Using these assumptions, the Trustees, in cooperation with the RP, determined that approximately 120 acres of marsh habitat, shoreline, and the water column had been injured in the vicinity of the North Pass facility (Figure 1.2).

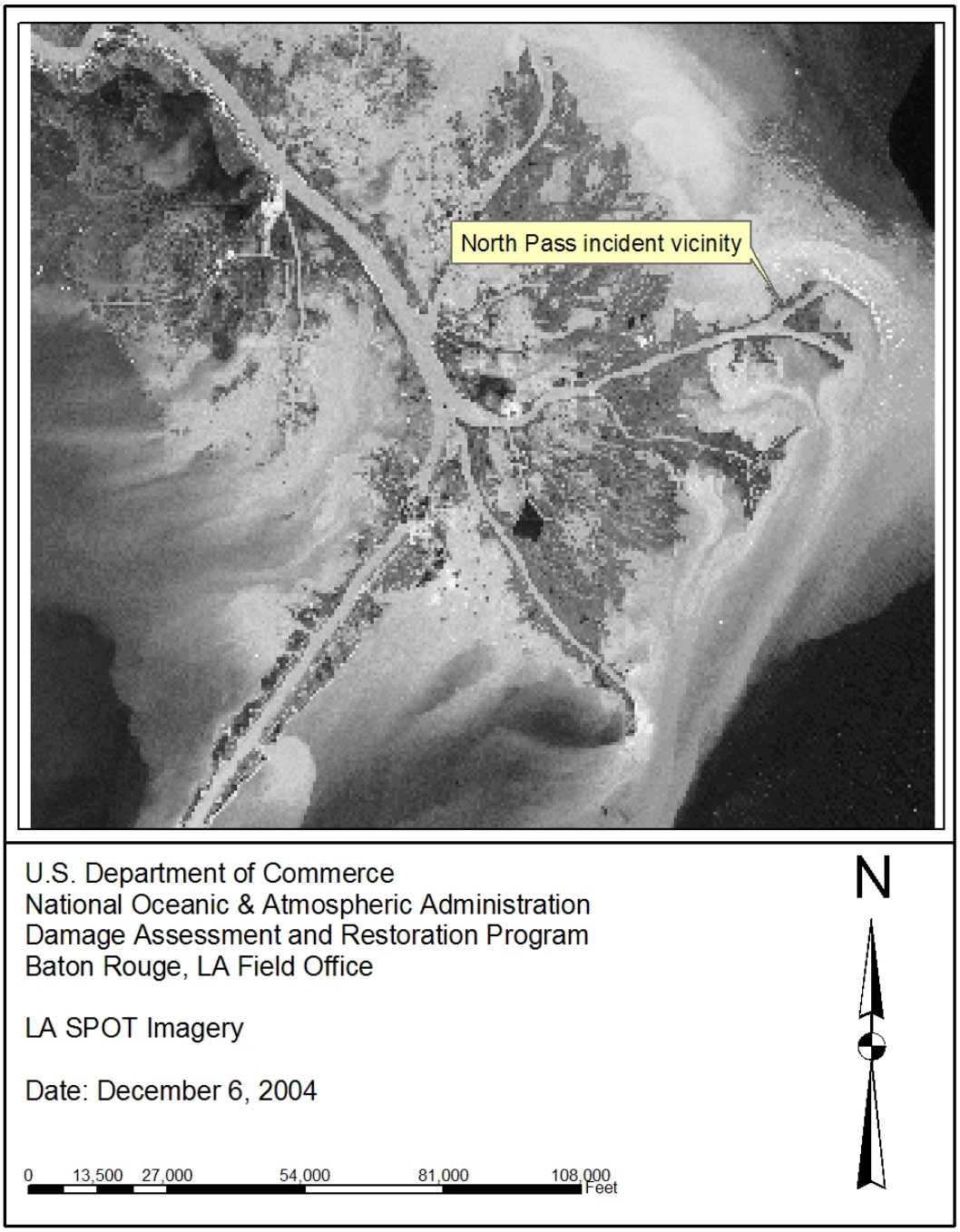

Figure 1.1 North Pass incident location in the Mississippi River delta, Plaquemines Parish, Louisiana.

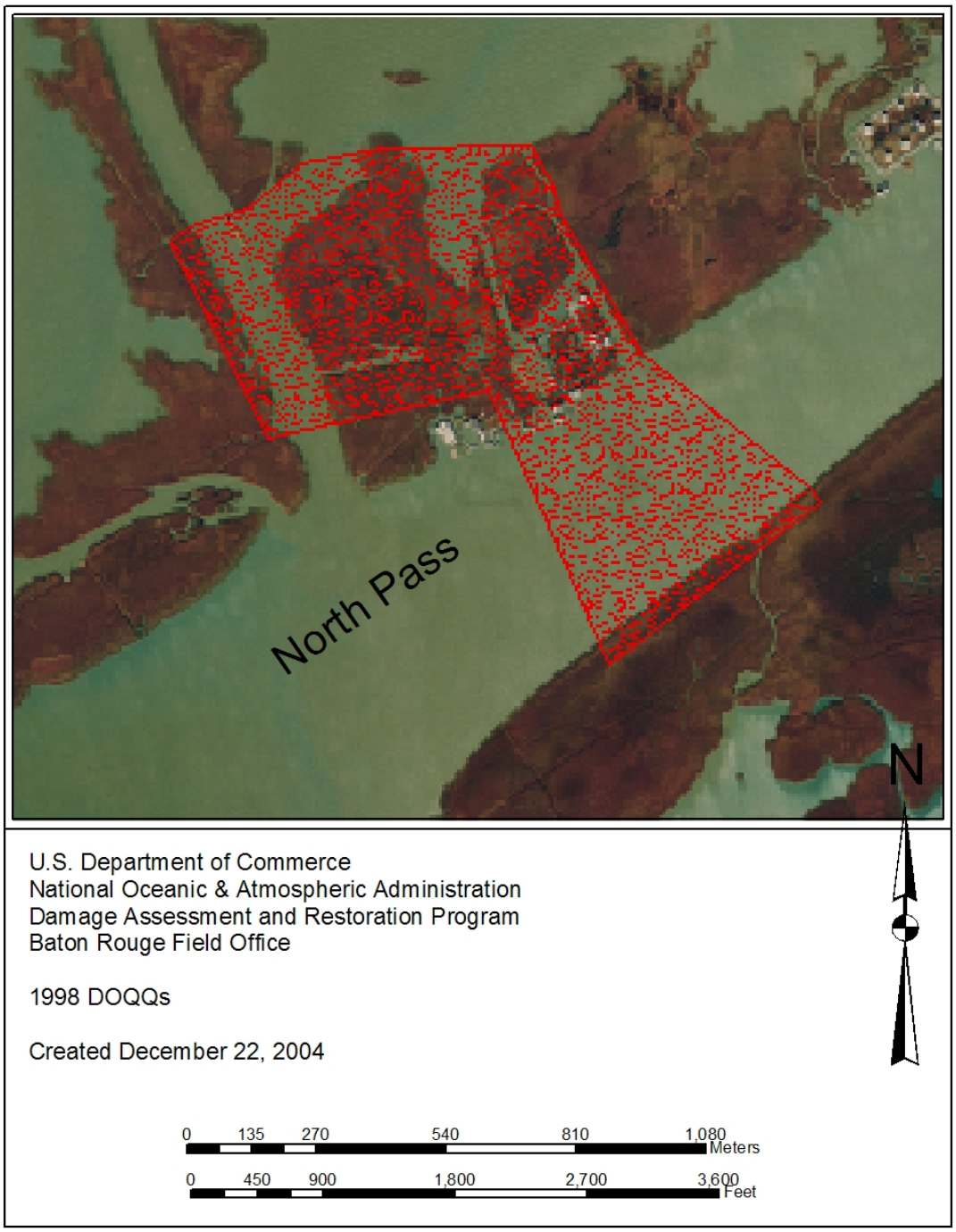

Figure 1.2 The area affected by oil from the North Pass incident is 120 acres of marsh and open water habitats within this polygon.

1.3 PROPOSED 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 was chosen for primary restoration. The Trustees evaluated nine restoration project alternatives with the potential to provide compensatory restoration. Based on analysis by the Trustees', a crevasse splay marsh creation was selected as the compensatory restoration alternative. Further discussion of selection criteria and the restoration alternatives considered follow in Chapter 5.

1.4 COORDINATION WITH THE RESPONSIBLE PARTY

The OPA and OSPRA natural resource damage assessment regulations (15 CFR Part 990 and OSPRA at LAC 43:XXIX.101 *et seq.*) require the Trustees to invite the RP to participate in the damage assessment process. Although the RP may contribute to the process in many ways, final authority to make determinations regarding injury and restoration rests solely with the Trustees. Accordingly, the Trustees delivered a formal invitation to Ocean Energy, Inc., on March 11, 2003. The RP formally accepted the Trustees' invitation on April 7, 2003. Prior to this formal invitation and acceptance, the Trustees and RP had already begun to work cooperatively, including participation in a joint site visit on October 18, 2002, and a joint meeting on November 14, 2002. Following the acquisition of Ocean Energy, Inc., by Devon Energy Corporation, the Trustees kept representatives from Devon Energy Corporation informed and the company continues to be an active and cooperative participant in the restoration planning process.

Information collected by all parties was shared, as were the results of analyses undertaken independently by the Trustees and RP. Coordination between the Trustees and RP reduced duplication of efforts, increased the cost-effectiveness of the assessment process, and increased sharing of information. The Trustees sought input and comments throughout the restoration planning phase and presented Devon Energy, Inc., with the draft DARP/EA prior to its release for public comment. This action is consistent with OPA regulations, and is intended to provide the opportunity for settlement of damage claims without litigation.

1.5 COORDINATION WITH THE PUBLIC

Throughout the injury assessment and restoration planning process, the Trustees have provided the public with information on the status of injury assessment and restoration planning efforts. The Trustees published a *Notice of Intent to Conduct Restoration Planning* in the Louisiana State Register (Vol. 29, No. 06, pgs. 1029-1030, June 20, 2003), The Plaquemines Gazette, Plaquemines Parish, LA, and The Advocate, Baton Rouge, LA, stating that, based on Preassessment findings, they were proceeding with restoration planning under OPA and OSPRA and opening an Administrative Record (AR) to facilitate public involvement in the restoration planning process (Appendix 1). Through this public outreach, the public was able to obtain the report for the injury assessment determination, provide restoration ideas and alternatives to the Trustees and identify agency contacts to obtain more information.

The draft DARP/EA (March 2005) provided the public with current information about the nature and extent of the natural resource and service injuries resulting from the incident and identified restoration alternatives that were evaluated by the Trustees. Public review of the draft DARP/EA 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 methods being proposed to restore injured natural resources and replace lost services. The draft DARP/EA was made available to the public during a 30-day comment period, that began on March 21, 2005, when a public notice announcing availability of the draft DARP/EA was issued. Public comment is consistent with all state and federal laws and regulations that apply to the natural resource damage assessment process, including Section 1006 of OPA, the natural resource damage assessment regulations at 15 C.F.R. Part 990 and OSPRA at LAC 43:XXIX.101 *et seq*., the National Environmental Policy Act (NEPA (42 U.S.C. §§4371 *et seq.*)), and the regulations implementing NEPA (40 C.F.R. §§1500 *et seq.*).

No comments were received during the public comment period, which ended April 19, 2005.

1.6 ADMINISTRATIVE RECORD

The Trustees compiled an AR, which contains documents considered and/or prepared by the Trustees during the Natural Resource Damage Assessment (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, as of the date of publication of this final DARP/EA, is provided in Appendix 1. Additional information and documents, including restoration planning documents, will be included when complete. Arrangements should be made in advance to review the AR record by contacting:

Louisiana Oil Spill Coordinators Office/Office of the Governor
Gina Muhs Saizan
150 Third Street, Suite 405
Baton Rouge, LA 70801
(225) 219-5800
Mon. - Fri. 8:00 am to 5:00 pm Central time zone
gina.saizan@la.gov

CHAPTER 2: PURPOSE AND NEED FOR RESTORATION

This final DARP/EA has been prepared jointly by the Trustees to identify the selected action for the restoration of natural resources and natural resource services injured by the September 22, 2002, discharge from an above-ground storage tank at the Ocean Energy Inc. – North Pass facility in Plaquemines Parish, Louisiana. The objective of this selected restoration action 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 is a designated natural resource trustee under 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.

2.1.2 Overview of OPA Requirements

NRDA is described under Section 1006(c) of OPA (33 U.S.C. § 2706(c)) and OSPRA (L.R.S. 30:2451 *et seq.*). Under the OPA and OSPRA NRDA regulations at 15 C.F.R. Part 990 and LAC 43:XXIX.101 *et seq*., the NRDA process consists of three phases: 1) Preassessment; 2) Restoration Planning; and 3) Restoration Implementation.

During the Preassessment Phase, the Trustees determine whether they have jurisdiction to pursue a NRDA for the incident. In order for the Trustees to proceed with a NRDA, the following conditions must be met under 15 C.F.R. § 990.41 and LAC 43:XXIX.119:

1. an incident must have occurred as defined at 15 C.F.R. § 990.33 and LAC 43:XXIX.109;
2. the incident must not be permitted under a permit issued under federal, state or local law;
3. the incident must not involve a public vessel; and
4. the incident must not be from an onshore facility subject to the Trans-Alaska Pipeline Authority Act (43 U.S.C. § 1651, *et seq.*).

The Trustees determined that an incident occurred and that all of the above conditions were met for the North Pass incident. In addition, based on early available information collected during the Preassessment Phase, Trustees must make a preliminary determination whether natural resources or services have been injured and/or are threatened by ongoing injury. Injury is defined as “an observable or measurable adverse change in a natural resource or impairment of a natural resource service” (15 C.F.R. § 990.33 and LAC 43:XXIX.109). Through coordination with response agencies (e.g., the

USCG), Trustees next determine whether response actions will eliminate injury or the threat of ongoing injury. If injuries are expected to continue, and feasible restoration alternatives exist to address such injuries, Trustees may proceed with the Restoration Planning Phase. Restoration planning also may be necessary if injuries are not expected to continue but are suspected to have resulted in interim losses of natural resources and services from the date of the incident until the date of recovery.

The purpose of the Restoration Planning Phase is to evaluate potential injuries to natural resources and services, and use that information to determine the need for, and scale of, restoration actions. Natural resources are defined as "land, fish, wildlife, biota, air, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States, any state or local government or Indian tribe" (15 C.F.R. § 990.30). This phase provides the link between injury and restoration and has two basic components: injury assessment and restoration selection.

The goal of injury assessment is to determine the nature and extent of injuries to natural resources and services, thus providing a factual basis for evaluating the need for, type of, and scale of restoration actions. As the injury assessment is being completed, the Trustees develop a plan for restoring the injured natural resources and services. The Trustees must identify a reasonable range of restoration alternatives, evaluate and select the preferred alternative(s), develop a Draft Restoration Plan presenting the alternative(s) to the public, solicit public comment on the Plan, and consider these comments when developing a Final Restoration Plan.

Under the regulations, the Final Restoration Plan is presented to the RPs at the start of the Restoration Implementation Phase, to implement or to fund the Trustees' costs of implementing the plan, thus providing the opportunity for settlement of damage claims without litigation. Should the RPs decline to settle a claim, OPA authorizes Trustees to bring a civil action against the RPs for damages, or to seek disbursement from the USCG's Oil Spill Liability Trust Fund equal to the value of the damages. Components of damages include the cost of implementing the selected restoration action or actions, including monitoring and necessary corrective actions, and the cost of the damage assessment itself (33 U.S.C. §§ 2701(5) and 2702(b) and L.R.S. 30:2451 *et seq.*). For this incident, however, the Trustees and RP worked cooperatively in the Restoration Planning Phase in identifying potential restoration actions. The RP has agreed to implement the selected restoration action in this final DARP/EA.

2.1.3 NEPA Consideration

Restoration of natural resources under OPA must comply with NEPA (42 U.S.C. §§4371 *et seq.*) and its implementing regulations (40 C.F.R. §§1500 *et seq.*). In compliance with NEPA, this final DARP/EA also serves as an Environmental Assessment (EA). As such, it includes a summary of the current environmental setting, describes the purpose and need for action, identifies alternative actions and their potential environmental consequences, and summarizes opportunities for public participation in the decision

process. This information is used to make a threshold determination as to whether preparation of an Environmental Impact Statement (EIS) is required prior to the selection of the final restoration action (i.e., whether the proposed action is a major federal action that may significantly affect the quality of the human environment).

In the draft DARP/EA, it was determined that the proposed restoration action did not meet the threshold requiring an EIS. The Trustees received no public comments on the draft DARP/EA affecting this judgment; therefore, a Finding of No Significant Impact (FONSI) determination will be made by the federal Trustee agencies (Appendix 6).

2.1.4 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 2.

CHAPTER 3: AFFECTED ENVIRONMENT

This chapter presents a brief description of the local physical, biological, and cultural environment affected by the North Pass incident, as required by NEPA. As described below, the affected environment provides habitat for a wide variety of fish, birds, mammals, and other organisms. Commercial fishing, recreational fishing, hunting, and wildlife viewing in the lower Mississippi River delta contribute to the economy of Plaquemines Parish. This deltaic marsh also provides ecosystem services, such as filtration, and protection from wind and storm surge damage.

3.1 PHYSICAL AND BIOLOGICAL ENVIRONMENT

This incident occurred in the modern Balize Delta (birdsfoot delta) in the lower Mississippi River, Plaquemines Parish, LA. This area was created over the last 700 to 1000 years, but much of the area is now being gradually lost due to subsidence and erosion primarily resulting from anthropogenic alterations in the river, subsidence, and sea-level rise. The southeastern reach of the delta where the incident occurred, North Pass and Pass a Loutre, is dominated by freshwater/ brackish marsh colonized by *Phragmites australis*, also know as roseau cane.

The lower Mississippi River and Balize Delta area supports a wide variety of plant and animal species. Bird species found in the region include, but are not limited to: snowy egrets, double-crested cormorants, various species of gulls, brown and white pelicans, ospreys and various hawks, kingfishers, and great blue herons. It is a critical wintering area for waterfowl and waterfowl counts on the adjacent Delta National Wildlife Refuge (NWR) have been recorded in excess of 400,000 ducks and geese during peak population periods[1]. Other wildlife in the area includes, but is not limited to, alligators, nutria, muskrats, and river otters. This area supports both fresh and marine aquatic species. Fish such as redfish, flounder, trout, catfish, buffalo, and gar, among many other species, are found in the waters of the Mississippi River and deltaic marshes. In many portions of the delta, shellfish such as crabs, oysters, and shrimp can be abundant.

3.1.1 Threatened and Endangered Species

The Endangered Species Act (ESA) of 1973 (16 U.S.C. §§1531, *et seq*.) instructs federal agencies to carry out programs for the conservation of endangered and threatened species and to conserve the ecosystems upon which these species depend. LDWF's Natural Heritage Program also lists species that are of special concern to the state. Table 3.1 provides a list of federal and state recognized endangered or threatened species, as well as species utilizing designated critical habitat, reported to reside in or migrate through the Mississippi Delta region, Plaquemines Parish, LA.

[1] US Fish and Wildlife Service refuges website: http://refuges.fws.gov/profiles/index.cfm?id=43555

Table 3.1 Federal and State Endangered or Threatened Species in Plaquemines Parish, LA

Common Name	Scientific Name	Status
Mammals		
West Indian manatee	*Trichechus manatus*	Endangered
Reptiles		
green sea turtle	*Chelonia mydas*	Threatened
hawksbill sea turtle	*Eretmochelys imbricate*	Endangered
Kemp's ridley sea turtle	*Lepidochelys kempii*	Endangered
leatherback sea turtle	*Dermochelys coriacea*	Endangered
loggerhead sea turtle	*Caretta caretta*	Threatened
Birds		
bald eagle	*Haliaeetus leucocephalus*	Threatened
brown pelican	*Pelecanus occidentalis*	Endangered
piping plover*	*Charadrius melodus*	Threatened
Fish		
gulf sturgeon*	*Acipenser oxyrinchus desotoi*	Threatened
pallid sturgeon	*Scaphirhynchus albus*	Endangered

***DESIGNATED CRITICAL HABITAT**

Gulf sturgeon: A final rule designating Gulf sturgeon critical habitat was published on March 19, 2003 (68 FR 13370) and 14 geographic areas (units) among the Gulf of Mexico rivers and tributaries were identified - 7 under USFWS jurisdiction and 7 under NOAA's National Marine Fisheries Service (NMFS) jurisdiction.

Piping plover: A final rule designating critical habitat for the wintering population of piping plovers was published on July 10, 2001 (66 FR 36087) and 7 geographic areas (units) in Louisiana along the Gulf of Mexico, rivers, and tributaries were identified.

3.1.2 Threatened and Endangered species habitat descriptions

3.1.2.1 Bald Eagle

Bald eagles are federally listed as threatened and may occasionally utilize the action area while foraging. The closest known nest is more than 10 miles northwest of the action area, near Venice, Louisiana.

3.1.2.2 Green, Hawksbill, Kemp's ridley, Leatherback, Loggerhead sea turtle

Endangered and threatened sea turtles forage or migrate through in the nearshore waters, bays, and sounds of Louisiana (NMFS is responsible for aquatic marine threatened of endangered species. Contact Eric Hawk (727) 570-5312 in St. Petersburg, Florida, for additional information regarding those species). Sea Turtles are not expected to frequent the selected restoration site, however, because of the freshwater and turbid character of the river under conditions.

3.1.2.3 West Indian manatee

West Indian manatees (Federally listed as endangered) occasionally enter Lakes Pontchartrain and Maurepas, and associated coastal waters and streams, during the summer months. Manatees have been 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.

3.1.2.4 Brown Pelican

Endangered brown pelicans are currently known to nest on Raccoon Point on Isles Dernieres, Queen Bess Island, Plover Island (Baptiste Collette), and islands in the Chandeleur chain. Pelicans change nesting sites as habitat changes occur. Thus, pelicans 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 pits and offshore sand bars as rest and roost areas. Major threats to this species include chemical pollutants, colony site erosion, disease, and human disturbance.

3.1.2.5 Piping Plover

The threatened piping plover winters in coastal Louisiana. Piping plovers may be present in Louisiana for up to 8 months, arriving from the breeding grounds as early as late July and remaining until late March. Piping plovers feed extensively on intertidal beaches, mudflats, sandflats, algal flats, and wash-over passes with no or very sparse emergent vegetation and require unvegetated of 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 dependant on a mosaic of sites distributed throughout the landscape, as the suitability of a particular site for foraging or roosting is dependent on local weather and tidal conditions. Plovers may move among sites as environmental conditions change. Critical habitat identifies specific areas that are essential to the conservation of the species. The primary constituent elements for wintering piping plover critical habitat are those habitat components that support foraging, roosting, and sheltering and the physical features necessary for maintaining the natural processes that support these habitat components. Those elements are found in geologically dynamic coastal areas that support 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.

3.1.2.6 Gulf sturgeon

The threatened Gulf sturgeon is an anadromous fish that occurs in many coastal rivers and streams and estuarine water from the Atchafalaya River to the Suwanee River, Florida. Adults and sub-adults spend eight to nine months in rivers and streams and three to four of the cooler months in estuarine or marine waters. Spawning occurs in coastal rivers between late winter and early spring. Sturgeons less than two years old appear to remain in riverine habitats and estuarine area throughout the year, rather than migrate to marine waters. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, and rivers and lakes of the Lake Pontchartrain basin and adjacent estuarine areas. Habitat alterations caused by water control structures that limit and prevent spawning, poor water quality, and over-fishing have negatively affected this species.

3.1.2.7 Pallid sturgeon

The pallid sturgeon is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the old River Control Structures) it may possibly occur in the Red River. The pallid sturgeon is adapted to large, turbid rivers with a diverse assemblage of habitats. Detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana. Habitat loss through river channelization and dams have affected this species throughout is range.

The effects of the proposed action to threatened and endangered species are discussed in Section 5.7.5.

3.2 CULTURAL ENVIRONMENT AND HUMAN USE

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

The lower Mississippi River and Balize Delta are relatively undeveloped areas and human presence in the area is generally limited to recreational fishing and hunting, commercial fishing, and industrial activities. This area is directly used for commercial and recreational crabbing, trapping, hunting, and fishing. Ecotourism (primarily bird and wildlife viewing and hunting and fishing) is increasingly important to the area. Oil and gas exploration and production also occur in this area.

Two wildlife refuges are located in the vicinity of the area affected by the incident. The Delta National Wildlife Refuge (NWR), established in 1935, borders the Ocean Energy facility to the north and is managed by the USFWS. It comprises approximately 48,800

acres of marshlands and open water. The primary purpose of the Delta NWR is to provide sanctuary and habitat for wintering waterfowl. The Pass A Loutre Wildlife Management Area borders the facility to the south. This nearly 115,000-acre tract of the Mississippi River delta was acquired by the state as a public waterfowl hunting area in 1921, and was transferred to the Fur and Refuge Division of LDWF in 1958.

CHAPTER 4: INJURY ASSESSMENT

This chapter describes the Trustees' efforts to quantify the nature, degree, and extent of injuries to natural resources and services resulting from the North Pass incident. The chapter begins with an overview of data collected and observations made immediately after the incident and during the Preassessment Phase of the NRDA process. The following section describes the Trustees' assessment strategy, including the approach used to identify, determine, and quantify potential injuries. The remainder of the chapter presents the results of injury assessments for the specific natural resources and services affected by the North Pass incident.

4.1 OVERVIEW OF THE PREASSESSMENT PHASE AND FINDINGS

Preassessment activities, as defined by OPA (15 C.F.R. §990.42) and OSPRA (LAC 43:XXIX.109), require the following criteria to be met before Restoration Planning can proceed:

- injuries have resulted, or are likely to 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.

The Trustees initiated Preassessment activities for the North Pass incident shortly after being notified of the discharge. Preassessment activities, as defined by OPA, focused on collecting ephemeral data essential to determine if the above criteria have been met. The following discussion summarizes key Preassessment activities and findings.

Oil Movement and Oiled Habitat Surveys:
The trajectory of the oil and the extent of oiling were documented frequently during the initial response using overflight observations, global positioning systems (GPS), photography, and on-water surveys. Trustees participated in these activities, which included a site visit with RP representatives on October 18, 2002. Light, moderate, and heavy oiling of freshwater marsh habitat were observed in addition to oil in channels and the water column. By using GPS coordinates taken in portions of the oiled area, the Trustees generated the assumption that the extent of oiling covered approximately 120 acres of shoreline, marsh, and nearshore water habitat.

Fish, Bird, and Wildlife Surveys:
The Trustees also considered potential injuries to wildlife, birds, fish, and water column biota. However, during helicopter overflights, ground surveys, and on-water surveys, the Trustees and RP observed no evidence (*i.e.*, wildlife, bird, or fish mortality) of such injuries. Fish and birds were observed using habitat adjacent to and within oiled freshwater marsh, thus, it is likely that the services the oil-affected marsh provided to these natural resources were injured. However, although these natural resources had the potential for injury, information gathered during the Preassessment Phase indicated that

these injuries were likely small. Therefore, further assessment of these resources was not carried forward into the Restoration Planning Phase. The Trustees and RP used protective estimates of oiled marsh injuries to compensate for potential injuries to these natural resources and services.

Information collected by the Trustees during the Preassessment Phase of the incident confirmed that injuries to natural resources (*i.e.*, freshwater marsh habitat) had occurred due to the incident and that response actions did not adequately restore the injured natural resources and services. The Trustees determined that a number of potential restoration actions exist to compensate for the losses. Based on these findings, the Trustees proceeded into the Restoration Planning Phase.

4.2 INJURY ASSESSMENT STRATEGY

The goal of injury assessment under 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 rule defines 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).

The injury assessment process typically occurs in two stages: injury determination and injury quantification. Injury determination begins with the identification and selection of potential injuries to investigate. The OPA regulations allow 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 when making injury determinations for this incident.

4.3 INJURY ASSESSMENT METHODS AND RESULTS

As briefly described above, the assessment of natural resource injuries resulting from this incident focused on freshwater marsh habitat. For this incident, marsh habitat broadly includes marsh vegetation, marsh sediments, associated fauna (e.g., polychaete worms living in marsh sediments), and adjacent waters.

Under OPA, Trustees should consider the following factors in selecting appropriate assessment procedures:

- the range of procedures available under the OPA regulations (15 C.F.R. §990.27(b));
- 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.

For this incident, the Trustees and RP agreed to use simple, cost-effective methods to document natural resource and service injuries. These methods relied on information gathered from the response and Preassessment activities, a trustee site visit, and relevant peer-reviewed literature, as well as the best professional judgment of local experts and Trustees familiar with the effects of oil in similar environments.

4.3.1 Injury Determination

The RP and Trustees worked cooperatively to assess the injuries to the marsh habitat. Data collected from the overflights, which tracked the extent of oil spread, in conjunction with GPS coordinates around the perimeter of the oiled area, were used by the Trustees and RP to determine that the oiled area was approximately 120 acres in size. Although the delineated acreage was primarily composed of marsh habitat, it also included waterways and interior marsh ponds that were affected by oil.

The nature of the oiling was variable over the 120 acres affected. In the majority of the marsh, actual oiling ranged from exposure and sheening to light oiling, while only smaller areas were observed to be heavily covered with oil. After reviewing all of the available information collected from the site, the RP and the Trustees agreed, for purposes of expediting the injury assessment, to assign a “moderately oiled” classification to the entire 120-acre injury area. The Trustees based this decision on professional judgment and experience, concluding that this assumption was reasonably conservative. Although use of this reasonably conservative assumption might tend to lead to a higher estimate of injury than likely occurred, it likely resulted in a more rapid and cost-effective assessment process than would occur if a more detailed breakdown of marsh injury was performed.

Once the area of injury and degree of oiling was established, the Trustees and RP assigned an estimate of lost services based on professional judgment and experience with other oil spills. The RP and the Trustees agreed that an initial 75% service loss over the entire 120-acre area of marsh was a reasonably conservative assumption. This assumption represents the average of the services lost over the 120 acres of marsh habitat injured, which ranged from near 0% (in areas exposed only to sheen) to 100% (in areas covered with heavy oil). The Trustees are confident that the assumption of an overall 75% loss of services is reasonably conservative and ensures that the environment and the public will be adequately compensated for the losses incurred.

The 120-acre area of injured marsh included large stands of *Phragmites australis.* Recent literature suggests that *P. australis* provides ecological benefits including high capacity for nutrient assimilation, and low rates of porewater denitrification, lower levels of porewater ammonium concentrations, in addition to providing substantial bird and wildlife habitat (Niedowski 2000). Additionally, recent studies using stable isotopes have established the importance of *Phragmites australis'* contribution to nutrient flows supporting estuarine fish (Weinstein *et al.* 2000). For purposes of this injury assessment, the ecological services provided by the stands of *P. australis* were considered comparable to other areas of oiled marsh.

Once the area of injury (120 acres) and initial service loss (75%) were established, the Trustees and RPs estimated the time for natural recovery to baseline or pre-spill conditions. Site-specific recovery time within the 120 acres may range from a few weeks to a few years, depending on the degree of oiling. There are uncertainties associated with the timeline for recovery given that the recovery process is based on complex interactions among biotic and abiotic factors and the degree of oiling. Observations made during the site visit of October 18, 2002 (four weeks after the incident) suggest that some areas of the oiled marsh had already begun to recover and would recover to 100% service flows relatively quickly (weeks to months). Other areas of marsh that were more heavily oiled would recover more slowly. Research on oiled *P. australis* in the lower Mississippi River's birdsfoot delta, Louisiana, suggests that areas containing floating oil produce no new live shoots, and decrease dramatically in both stem density and aboveground biomass after one year when compared to intensively and lightly cleaned areas (Lin *et al.* 1999). In addition, total petroleum hydrocarbons (TPH) and total target aromatic hydrocarbons (TTAH) remain significantly elevated in heavily oiled *P. australis* marsh (Lin *et al.* 1999).

Taking into account the variation in recovery time and the extent of marsh oiling, the RP and the Trustees agreed that a one-year recovery time throughout the 120-acre area was a reasonable assumption. This recovery time is meant to average the rapid recovery of the lightly oiled (i.e., sheen) areas with those of the more heavily oiled areas. While the actual biological processes that determine recovery from an incident are complex and often site-specific, the Trustees based this estimate of recovery time on recovery trajectories observed from past similar incidents (Trustees 1995 [Dixon Bay]).

In summary, the Trustees and RP agreed to an initial 75% service loss over the entire 120-acre oiled area, with full recovery within one year. The Trustees believe that these assumptions are protective, tending to produce an upper-bound injury estimate. The Trustees and RP chose not to further refine the injury estimate through in-depth studies. While collecting more information may increase the precision of the estimate of the impacts, the Trustees believe that the type and scale of restoration actions would not substantially change as a result of more detailed injury assessment. In addition, the costs of refining the injury estimate would be greater than the potential benefits from information gained.

4.3.2 Injury Quantification

Once the injury parameters were established, the Trustees used a Habitat Equivalency Analysis (HEA [NOAA 2000]) model to quantify the impacts due to the oil. With HEA, interim losses (i.e., from the time of injury until recovery to baseline[2]) are quantified as lost habitat service acre years, where a service acre year is the flow of services from one acre of habitat for one year. Using the injury parameters described above (i.e., 120 acres with a 75% initial loss of services and full recovery in 1 year) and applying a discount rate of 3% per year (NOAA 1999), the Trustees and RP quantified injuries as 56.20 discounted service acre years. This injury accounts for reductions in the entire flow of marsh habitat services, including those that support birds and aquatic fauna.

[2] Baseline refers to the level of services that the resource would have maintained but for the injury resulting from the incident.

CHAPTER 5: RESTORATION ALTERNATIVES

The goal of restoration under OPA is to restore natural resources injured by incidents to the condition that they would have been if the incident had not occurred. OPA requires 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, the condition they would be in but for 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 marsh habitat impacted by this incident has either recovered or, in the small areas where injury persists, will recover to baseline conditions naturally in a short period of time. Active primary restoration was considered by the Trustees, but it was decided that such activities had a strong likelihood of causing additional injury to the natural resources and services. Therefore, the focus of this final DARP/EA is on compensatory restoration.

The Trustees considered nine restoration alternatives potentially capable of providing compensatory restoration for the injuries resulting from the North Pass incident. All nine potential restoration alternatives were evaluated based on the criteria presented in Section 5.2., and a selected alternative was then scaled to ensure that its size would appropriately compensate for the injuries resulting from the incident. The Trustees employed a service-to-service scaling method, where restoration actions provide natural resources and/or services of the same type and quality, and of comparable value as those lost.

The selected restoration alternative included in this chapter was based on a project-specific preliminary design concept rather than detailed engineering plans. The final selected project may require additional refinements or adjustments to suit site conditions or other factors based on further Trustee analysis.

5.2 EVALUATION CRITERIA

The OPA regulations (15 C.F.R. §990.54) require the Trustees to identify restoration alternatives based on certain criteria. The following criteria, presented in the order given in the regulations, were used:

- 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.

The Trustees considered potential restoration projects using the above OPA criteria. The key criterion for the Trustees for the North Pass NRDA is the second in the list, because this criterion most clearly indicates whether the goal of making the public whole from losses resulting from the incident is met. This is also referred to as nexus to injury since the criterion targets projects that provide the same type of trust resources and services, both on site and off-site, that are lost due to the potential injury. Of the restoration project alternatives considered by the Trustees, nine met this criterion and were further evaluated using the all of the OPA criteria. Basic project descriptions are listed below and the results of the evaluation are listed in Table 5.1.

Octave Pass crevasse splay marsh – This project would entail cutting a crevasse in the right descending bank of Octave Pass to foster the natural development of freshwater marsh. The marsh development would occur as sediment-laden water enters a shallow water area adjacent to the pass; thereby, allowing sediment to fall out of suspension and, through time, create sub-aerial features that would naturally vegetate.

North of Yankee Pond marsh creation - This project would fortify and restore wetlands northeast of Lake Cataouatche by protecting the shoreline with 3300 feet of rock armor, then filling the area of open water behind the armor with dredged material. Another 6400 feet of shoreline along Lake Cataouatche would be protected through a combination of rock armor and modifications to spoil bank elevations.

Southeast Lake Salvador near Bayou Villars shoreline protection - This project would protect approximately 12,000 feet of shoreline along the southeastern rim of Lake Salvador through the placement of rock armor. Interior marshes would be protected through the construction of plugs at three oil and gas canal entrances along the western bank of the Intracoastal Waterway and the spoil banks would be graded.

Delta Farms levee stabilization - This project would both protect and create marsh through the construction of 10,291 feet of D- concrete sheetpiling and the placement of dredged material behind it. Dredge material would be obtained from either Bayou Lafourche or the Gulf Intracoastal Waterway.

Gulf Intracoastal Waterway shoreline stabilization Phase I - This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 16,000 feet of D-concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW.

Gulf Intracoastal Waterway shoreline stabilization Phase II - This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 18,500 feet of D-concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW.

Gulf Intracoastal Waterway shoreline stabilization Phase III - This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 20,000 feet of D-concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW.

North of Little Lake marsh creation Phase II - This project would involve the placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from Little Lake and transported via slurry pipeline.

North of Clovelly Farms levee stabilization - This project would involve the placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from Bayou Lafourche or borrow canals and transported via slurry pipeline.

Table 5.1 A summary of each project's ability to satisfy the project selection criteria listed in the OPA regulations. (+) indicates strong or likely, (0) indicates moderate, and (-) indicates a weak relationship or not likely to occur between the project and that criterion. The Trustees' selected project is indicated in bold.

Project	OPA Criteria					
	Cost Effectiveness	Strength of Nexus	Likelihood of Success	Future or collateral injury prevention	Multiple benefits	Public Health and Safety
Octave Pass crevasse	++	+	+	0	++	-

Project	OPA Criteria					
	Cost Effectiveness	Strength of Nexus	Likelihood of Success	Future or collateral injury prevention	Multiple benefits	Public Health and Safety
North of Yankee Pond marsh creation	+	+	+	0	+	-
SE Lake Salvador Shoreline Protection	-	+	0	0	0	-
Delta Farms levee stabilization	0	+	0	0	0	-
GIWW Bank Stabilization Phase I	-	+	0	0	0	-
GIWW Bank Stabilization Phase II	-	+	0	0	0	-
GIWW Bank Stabilization Phase III	-	+	0	0	0	-
North of Little Lake Phase II Marsh Creation	+	+	+	0	+	-
North of Clovelly Farm Levee Stabilization	0	+	0	0	0	-

5.3 NEPA CONSIDERATIONS

The Trustees analyzed the potential effects of each project on the quality of the human environment to comply with the requirements of NEPA. NEPA's implementing regulations direct federal agencies to evaluate the potential significance of proposed 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 proposed action, the NEPA regulations (40 C.F.R. §1508.27) suggest consideration of ten factors:

- Likely impacts of the proposed 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.

5.4 Evaluation of No Action/ Natural Recovery Alternative

NEPA requires the Trustees to consider a "no action" alternative, and the OPA regulations require consideration of the natural recovery option. In this case, these options are equivalent. Under this alternative, the Trustees would take no direct action to restore injured natural resources or compensate for lost services pending environmental recovery. 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 appropriate for primary restoration. However, the no action alternative is rejected for compensatory restoration. OPA clearly establishes Trustee responsibility to seek compensation for interim losses pending recovery of the natural resources. This responsibility cannot be addressed through a no action alternative. Losses were suffered during the period of recovery from this incident and technically feasible, cost-effective alternatives exist to compensate for these losses.

5.5 Selected Restoration Alternative: Crevasse splay construction along Octave Pass

The Trustees selected one project using the evaluation criteria presented in Section 5.2 and summarized in Table 5.1. Below is a description and analysis of the project, as well as how the restoration project was scaled to restore natural resource and service injuries.

Project Description

The selected compensatory project alternative for marsh injuries is the creation of an approximately six and a half acre crevasse splay in the Delta National Wildlife Refuge

along Octave Pass (Figure 5.1). The property is currently in public ownership and actively managed by the U.S. Fish and Wildlife Service to provide sanctuary and habitat for waterfowl.

This project will create a functioning freshwater/ brackish marsh that provides services similar to those provided by the injured marsh. A crevasse will be cut in the right descending bank along Octave Pass, in the Delta NWR, to promote infilling of shallow ponds with sediment-laden river water and eventually create sub-aerial land (or deltaic splay) that becomes colonized by native marsh vegetation. The process will continue as long as the crevasse is open, with the advancing edge of the splay made up of plants such as *Sagittaria*, and the older sections composed of marsh vegetation such as *Scirpus*. Over time, the crevasse will begin to fill in, and the formed marsh will begin to subside. Existing crevasses in similar sites have lasted approximately 20 years (to date), and the created marsh is not anticipated to be fully lost for another 50 years or more (James Harris, pers. comm. 2004).

Restoration Goal

Create a sustainable, structurally, and functionally equivalent emergent crevasse-splay marsh that compensates the public for lost services and resources due to the incident.

Probability of Success

Creating crevasse splays is a feasible and proven technique with established methods and documented results. Local, state, and federal agencies have successfully implemented similar projects in this region of the modern Mississippi (Belize) Delta. 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 growth and development (e.g., elevation of the crevasse splay at year one, year three, and year five; colonization by native emergent vegetation, etc.). 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.

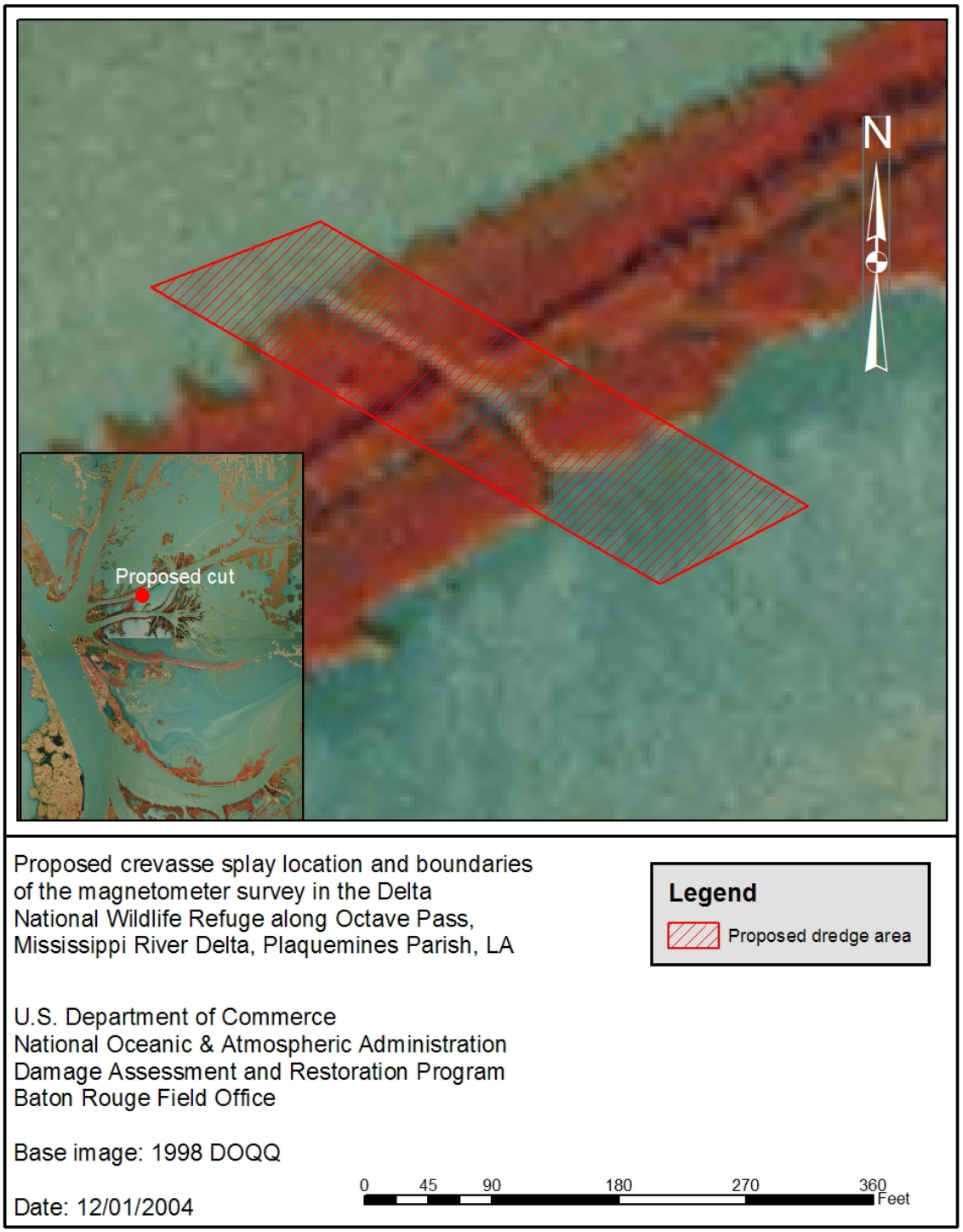

Figure 5.1 Location of the selected project to create a crevasse splay along Octave Pass, Delta National Wildlife Refuge, Plaquemines Parish, LA.

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 include re-cutting the bank along Octave pass to allow a greater volume of sediment-laden water into the receiving basin.

Evaluation

This project meets the evaluation criteria discussed in Section 5.2. Creation of a crevasse splay 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 cost-effectiveness, lifespan, and high provision of services. That is, since there is little construction activity and natural riverine processes are responsible for building the wetland, construction costs are greatly reduced. Additionally, since land building is a continual process through the replenishment of sediment and nutrients by the river, the lifespan of the project, and the services provided, is longer than that of a typical dredge and fill restoration project. Last, the crevasse-splay is built through natural processes, therefore, the level of services provided is 100% that of other natural wetlands.

The Trustees do not anticipate any adverse impacts. Other than the inherent risk to workers, there is no significant risk to human health and safety.

Scaling Approach

The HEA method was used to determine the size of the marsh restoration 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 based on the quantification of incident-related natural resources injuries. HEA considers 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 estimates for the HEA input parameters identified above, the Trustees relied on resource agency staff experience with creating crevasse splays, input from a USFWS employee (James Harris, pers. comm. 2004), data from other damage assessment cases, and information in the scientific literature (Boyer *et. al* 1997, Roberts 1997, Figure 5.2). Using this information, the Trustees assumed that the marsh would be completed in 2005, with a project life span of 30 years. Services provided (as a percent of a fully functioning marsh) were determined to be 15 percent in 5 years; 75 percent in 10 years; and 100 percent in 15 years. After year 15, the services will decrease to 0 percent by year 30. Based on these inputs and assuming a three percent annual discount rate, each crevasse splay acre provides a credit of 8.74 discounted service acre-years. Therefore, a crevasse-splay marsh of 6.43 acres at the selected restoration site will compensate for the 56.20 discounted service acre-years of marsh service lost due to the

incident (determined in Section 4.3.2; see also AR "Final HEA memo"). However, it is expected that this crevasse will lead to the creation of greater than 6.43 acres of splay marsh; thereby, providing a greater level of compensation than required for the natural resource injuries.

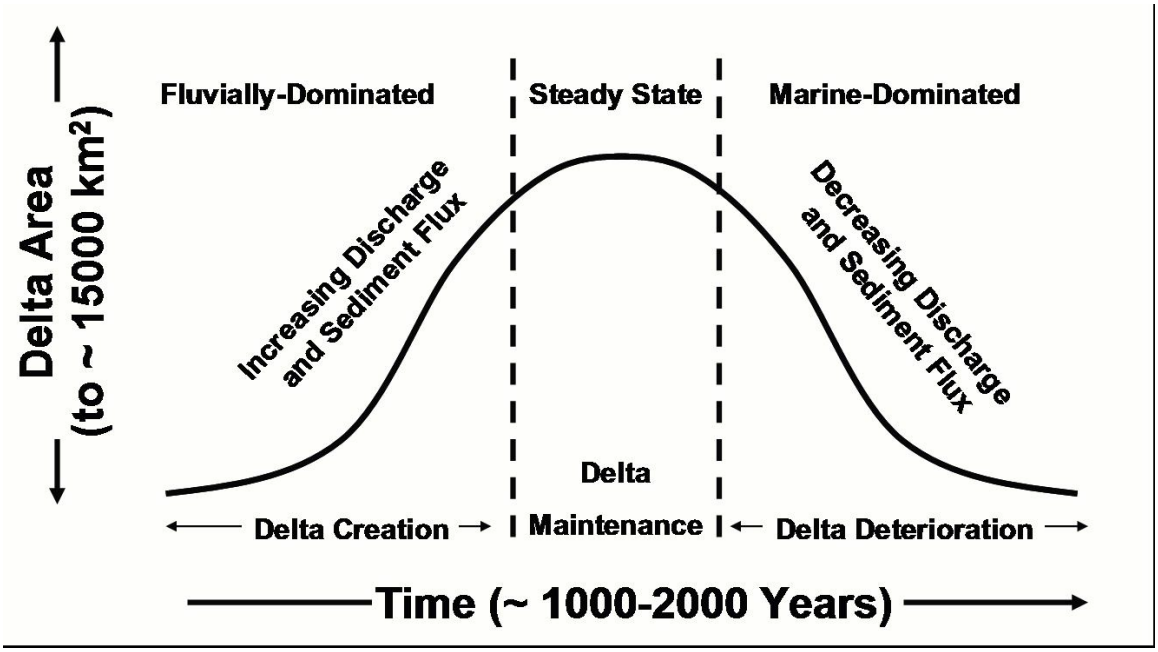

Figure 5.2 This curve, from Roberts (1997), shows the delta cycle for large deltas (t=1000 to 2000 y). The curve and process are the same for subdeltas (t = 150 to 200 y) and crevasse splays (t = decades). Therefore, using a lifespan of 30 years for a splay project, full maturity (steady state) would be reached at 15 years. In addition, a similar life span was assumed for a compensatory crevasse splay for the Westchester incident, which occurred in the lower Mississippi River in November 2000 (Trustees 2001).

5.6 NON-SELECTED ALTERNATIVES

The Trustees considered a number of alternative restoration projects to replace ecological losses resulting from the incident (Section 5.2, Table 5.1). Projects considered, 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:

- **North of Yankee Pond wetland restoration:** This project would fortify and restore wetlands northeast of Lake Cataouatche by protecting the shoreline with 3300 feet of rock armor, then filling the area of open water behind the armor with dredged material. Another 6400 feet of shoreline along Lake Cataouatche would be protected through a combination of rock armor and modifications to spoil bank elevations. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity), and is more cost-effective due to the minimum amount of construction

required to dredge the crevasse channel and the increased cost of this non-selected alternative due to shoreline fortification. Additionally, the crevasse-splay marsh provides a higher level of benefits since the wetland is created through natural processes.

- **Southeast Lake Salvador near Bayou Villars shoreline Protection/ Stabilization:** This project would protect approximately 12,000 feet of shoreline along the southeastern rim of Lake Salvador through the placement of rock armor. Interior marshes would be protected through the construction of plugs at three oil and gas canal entrances along the western bank of the Gulf Intracoastal Waterway and the spoil banks would be graded. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity). The crevasse is also more cost-effective since shoreline protection projects typically involve dredging access channels, placing rip-rap or other materials, and potentially backfilling the access channels; thereby, drastically increasing costs. The likelihood of success of shoreline protection projects in low energy environments has been increasingly questioned by local practitioners and restoration scientists in recent years because constructed projects in these areas of coastal Louisiana have shown increased localized erosion on the periphery of the structures. Shoreline protection features also may limit fish access to a greater degree than a crevasse-splay marsh.

- **Delta Farms Levee Stabilization:** This project would both protect and create marsh through the construction of 10,291 feet of D- concrete sheetpiling and the placement of dredged material behind it. Dredge material would be obtained from either Bayou Lafourche or the Gulf Intracoastal Waterway. This project was not selected because the Trustees believe the crevasse splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity). The crevasse-splay marsh is also more cost-effective sine this non-selected alternative will utilize a couple different construction techniques (dredging of flotation, driving of sheetpiling, casting of dredge material, and potentially the planting of the dredged material. Due to the shoreline protection features, it is also likely that benefits currently provided, such as fish access, will be impeded. Additionally, little information exists regarding the likelihood of success when utilizing sheetpiling for shoreline protection, or on the long term impacts to the local area as a result of this technique.

- **Gulf Intracoastal Waterway (GIWW) Bank Stabilization Phase I:** This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 16,000 feet of D- concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity). The crevasse-splay marsh is also more cost-effective since shoreline protection projects typically involve dredging access channels, placing rip-rap or other materials, and potentially backfilling the access channels; thereby, drastically

increasing costs. The likelihood of success of shoreline protection projects in low energy environments has been increasingly questioned by local practitioners and restoration scientists in recent years because constructed projects along coastal Louisiana have shown increased localized erosion on the periphery of the structures. Shoreline protection features also may limit fish access to a greater degree than a crevasse-splay marsh. Additionally, timing of implementation and scalability were uncertain due to the many phases of this project.

- **Gulf Intracoastal Waterway (GIWW) Bank Stabilization Phase II:** This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 18,500 feet of D- concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity). The crevasse-splay marsh is also more cost-effective since shoreline protection projects typically involve dredging access channels, placing rip-rap or other materials, and potentially backfilling the access channels; thereby, drastically increasing costs. The likelihood of success of shoreline protection projects in low energy environments has been increasingly questioned by local practitioners and restoration scientists in recent years because constructed projects along coastal Louisiana have shown increased localized erosion on the periphery of the structures. Shoreline protection features also may limit fish access to a greater degree than a crevasse-splay marsh. Additionally, timing of implementation and scalability were uncertain due to the many phases of this project.

- **Gulf Intracoastal Waterway (GIWW) Bank Stabilization Phase III:** This project would stabilize the quickly eroding bank of the GIWW through the placement of approximately 20,000 feet of D- concrete sheetpiling. The area of open water between the sheetpiling and marsh would be filled to elevations suitable for the establishment of emergent marsh vegetation using material dredged from the GIWW. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity). The crevasse-splay marsh is also more cost-effective since shoreline protection projects typically involve dredging access channels, placing rip-rap or other materials, and potentially backfilling the access channels; thereby, drastically increasing costs. The likelihood of success of shoreline protection projects in low energy environments has been increasingly questioned by local practitioners and restoration scientists in recent years because constructed projects along coastal Louisiana have shown increased localized erosion on the periphery of the structures. Shoreline protection features also may limit fish access to a greater degree than a crevasse-splay marsh. Additionally, timing of implementation and scalability were uncertain due to the many phases of this project.

- **North of Little Lake Phase II Marsh Creation:** This project would involve the placement of dredged material at elevations suitable for the establishment of

emergent marsh vegetation. Material would be dredged from Little Lake and transported via slurry pipeline. This project was not selected because the Trustees believe the crevasse-splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity), and is more cost-effective due to the minimum amount of construction required to dredge the crevasse channel. Additionally, the crevasse-splay marsh provides a higher level of benefits since the wetland is created through natural processes.

- **North of Clovelly Farms Levee Stabilization:** This project would involve the placement of dredged material at elevations suitable for the establishment of emergent marsh vegetation. Material would be dredged from Bayou Lafourche or borrow canals and transported via slurry pipeline. This project was not selected because the Trustees believe the crevasse splay creation along Octave Pass has a stronger nexus to the area injured by the incident (in terms of proximity), and is more cost-effective due to the minimum amount of construction required to dredge the crevasse channel. Additionally, the crevasse-splay marsh provides a higher level of benefits since the wetland is created through natural processes.

5.7 ENVIRONMENTAL CONSEQUENCES (INDIRECT, DIRECT, CUMULATIVE)

This section addresses the potential overall cumulative, direct, and indirect impacts, and other factors to be considered in both OPA and NEPA regulations for the project selected to restore resources and/or services lost as a result of the incident.

5.7.1 Cumulative Impacts

Since the project selected by the Trustees will be designed and built to achieve recovery of injured natural resources, the cumulative environmental consequences will be largely beneficial. Monitoring of the selected project funded under this final DARP/EA will confirm that cumulative impacts will be beneficial rather than adverse. Any unanticipated cumulative adverse effects from the selected project identified prior to implementation will result in reconsideration of the project by the Trustees.

5.7.2 Indirect Impacts

Environmental consequences may not always be limited to the project location. The selected project is expected to indirectly benefit a variety of species by improving habitats and to improve recreational opportunities.

5.7.3 Direct Impacts

Overall, the selected project outlined in this final DARP/EA will enhance the Mississippi Delta ecosystem. However, it is anticipated that there will be some short-term, direct impacts from the selected project such as:

- Noise and Air Pollution. Machinery and equipment used during construction will generate noise. This noise may disturb wildlife and humans using the area. However, once built, the selected project will not cause significant noise impacts.

- Water and Sediment Quality. Although implementation of the selected project should result in no significant impact to water quality, there may be temporary increases in sedimentation and turbidity due to the dredging operation. Best management practices along with other avoidance and mitigation measures required by state and federal regulatory agencies will be employed to minimize any water quality and sedimentation impacts.

- Visual/Aesthetic. There may be temporary visual impacts during implementation of the selected project due to the presence of heavy equipment. Once the Trustees complete the project, the visual impacts will cease. Beneficial aesthetic impacts will then extend to the users of the project area.

- Public Access/Recreation. Public access along Octave Pass may be temporarily affected during construction activities. Because implementation time for the selected project will be relatively short, the impact will be short.

- Other (e.g., economic, historical, land use, transportation). No significant adverse effects are anticipated to sediment quality, soil, geologic conditions, energy consumption, or adjacent wetlands. The selected restoration project will have no adverse social or economic impacts on neighborhoods or communities. General land use patterns will not be affected by the selected alternative nor is it anticipated that any known archaeological sites or sites of cultural significance will be adversely affected.

5.7.4 Environmental and Socioeconomic Impacts

Crevasse-splays are recognized for providing numerous beneficial ecological functions, including habitat for juvenile fish, exporting detritus (energy source for the aquatic food web) into the estuary, and increasing water quality by filtering sediments and other pollutants from the water column. As part of the marsh complex in the Mississippi Delta, crevasse-splays also provide many additional benefits such as storm surge protection, and habitat for birds and mammals.

Creating a splay marsh relies on the natural delta building process and is not expected to have any significant adverse environmental or economic impacts. Any impacts to existing habitats from project construction are expected to be temporary and minor, but the environmental benefits of this project will far outweigh this impact, as proven by the performance of other crevasse projects in this area.

5.7.5 Effects to threatened and endangered species

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

The selected compensatory alternative is the creation of a splay marsh by cutting a crevasse through the levee bank at Octave Pass on Delta National Wildlife Refuge. Implementation of this alternative could cause temporary impacts to water quality due to increased turbidity; however, the impacted area represents only a small portion of the total feeding habitat available to eagles. Accordingly, the dredging activity is not likely to adversely affect bald eagles.

Due to the low salinity and high turbidity of the Mississippi Delta, it is unlikely that the green, hawksbill, Kemp's ridley, leatherback, or loggerhead sea turtles will utilize the area. Therefore, the construction of the selected project and the splay that will result is not likely to adversely affect sea turtles.

West Indian manatees may occasionally occur at the mouth of the Mississippi River. Should dredging activities be implemented during the summer months an observer will be watching for manatees to ensure that collisions are avoided. Accordingly, this selected alternative is not likely to adversely affect this species.

Brown pelicans are known to occur near the project area. They have been recorded nesting at the mud lumps at the mouth of the Mississippi River at South Pass and Baptiste Collette Bayou. The selected crevasse would be located approximately 20 miles north of the mud lumps and 5 miles south of Baptiste Collette Bayou. The crevasse would provide features of benefit to brown pelicans; creation of a splay and associated submerged plant growth that would provide nursery habitat for their prey-base fishes and conversion of land (i.e., river bank) into deepwater diving habitat within the crevasse that would facilitate brown pelican feeding. Therefore, the cutting of a crevasse and creation of a splay marsh is not likely to adversely affect the brown pelican.

Piping plovers may utilize mud flats in the selected crevasse splay area. Piping plover critical habitat is located on the unnamed sand (spoil) islands off South Pass of the Mississippi River near Port Eads. The selected crevasse and marsh splay would be located approximately 24 miles northwest of designated critical habitat and would provide only features of benefit to piping plover as the creation of a splay and associated mud flats would provide foraging habitat. Therefore, cutting of a crevasse and creation of a splay marsh is not likely to adversely affect the piping plover or its designated critical habitat.

Gulf sturgeon and pallid sturgeon have been known to occur occasionally in or at the Mouth of the Mississippi River. The crevasse would be excavated with a suction dredge. The temporary localized increase in turbidity of the river at the dredge site would be

minimized with this method. The action would convert the levee bank into a small waterway allowing river water and sediments in the marsh. Because this alternative would result in only minor, temporary impacts to water quality, it is not likely to adversely affect Gulf or pallid sturgeon. The selected restoration action is not likely to adversely affect designated critical habitat for Gulf sturgeon.

In summary, the Trustees believe that the selected project in this restoration plan will not cause significant adverse impacts to natural resources or the services they provide. Further, the Trustees do not believe the selected project will affect the quality of the human environment in ways deemed "significant."

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ACRONYMS

AR	Administrative Record
CEQ	Council on Environmental Quality
COE	Corps of Engineers
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DARP/EA	Damage Assessment and Restoration Plan/ Environmental Assessment
DOQQ	Digital Ortho-quarter-quad
EA	Environmental Assessment
EFH	Essential Fish Habitat
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FWCA	Fish and Wildlife Coordination Act
GIWW	Gulf Intracoastal Waterway
GPS	Global Positioning System
HEA	Habitat Equivalency Analysis
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LOSCO	Louisiana Oil Spill Coordinator's Office
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
NWR	National Wildlife Refuge
OPA	Oil Pollution Act
RP	Responsible Party
SHPO	State Historic Preservation Officer
TPH	Total petroleum hydrocarbons
TTAH	Total target aromatic hydrocarbons
USCG	United States Coast Guard
USDOI	United States Department of the Interior
USFWS	United States Fish and Wildlife Service

APPENDICES:

APPENDIX 1. Index of the Administrative Record for the North Pass Incident.

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
     - 3.1.2. Published in the Baton Rouge Advocate
     - 3.1.3. Published in the Plaquemines Gazette
     - 3.1.4. Published in the Plaquemines Watchman

4. **Response Phase Information**
   - 4.1. National Response Center Incident Report: NRC #623760
   - 4.2. LOSCO response photo CD
   - 4.3. NRDA Trustee's collaborative field observation map from 10/18/04
   - 4.4. NRDA Trustee's collaborative photo CD

5. **NRDA Pre-assessment Phase**
   - 5.1. 10/31/02 Meeting Summary Letter to Gordon Ganaway dated 12/20/02
   - 5.2. Letter of invitation to the Responsible Party to participate in the Natural Resource Damage Assessment for the North Pass incident dated 03/11/03
   - 5.3. 2/20/03 Meeting Summary Letter to Gordon Ganaway dated 7/14/03
   - 5.4. Letter from the RP accepting the invitation to participate in the Natural Resource Damage Assessment dated 04/07/03.

6. **Injury Assessment**
   - 6.1. Letter to Administrative Record from NOAA documenting HEA results dated 2/25/03.
   - 6.2. Letter from Barbara Dougherty regarding Devon Energy being corporate successor to Ocean Energy dated 07/02/04.

7. **Restoration Planning**
   - 7.1. Primary/Compensatory Restoration
     - 7.1.1. Letter to David Bernhart from Daniel Hahn requesting a list of species found in the incident and project area.

7.1.2. Letter to Deborah Fuller from John Rapp requesting a list of species found in the incident and project area.

7.1.3. Letter to Rickey Ruebsamen from John Rapp regarding EFH dated 11/23/04

7.1.3.1. Letter from Miles Croom concurring with the Trustees EFH determination dated 12/3/04

7.1.4. Letter to Russell Watson from John Rapp regarding ESA dated 11/23/04

7.1.4.1. Letter to AR dated 12/06/04 describing threatened and endangered species habitat and effects of restoration on the species and habitat.

7.1.4.1.1. Letter from Russell Watson concurring with the Trustees ESA determination dated 12/14/04

7.1.5. Letter to Eric Hawk from John Rapp regarding ESA dated 11/23/04

7.1.5.1. Letter from David Bernhart concurring with the Trustees ESA determination dated 11/29/04

7.1.6. Letter to Pamela Breaux (SHPO) from John Rapp regarding cultural resources dated 11/23/04

7.1.6.1.Letter from Pam Breaux concurring with the Trustees Section 106 determination dated 12/20/04

7.1.7. Letter to Alabama Coushatta Tribe of Texas from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.8. Letter to Caddo Nation from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.9. Letter to Chitimacha Tribe of Louisiana from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.10. Letter to Coushatta Tribe of Louisiana from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.11. Letter to Jena Band of Choctaw Indians from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.12. Letter to Mississippi Band of Choctaw Indians from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.13. Letter to Quapaw Tribe of Oklahoma from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.1.14. Letter to Tunica-Biloxi Indians of Louisiana from John Rapp regarding Traditional Cultural Properties dated 11/23/04

7.2. Restoration Plans

7.2.1. 02/28/04 Draft Damage Assessment and Restoration Plan/Environmental Assessment (DARP)

7.3. Notice of Availability of the draft DARP/EA published in the Louisiana State Register

7.4. Notice of Availability published in the Plaquemines Gazette

7.5. Notice of Availability published in the Baton Rouge Advocate

8. Restoration Implementation

9. Public Outreach and Involvement

APPENDIX 2. 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
OPA establishes a liability regime for oil spills that injure or are likely to injure natural resources and/or the services that those resources provide to the ecosystem or humans. 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
An Environmental Assessment (EA) was prepared for the restoration projects as part of the Damage Assessment and Restoration Plan/Environmental Assessment (DARP/EA). This EA evaluates the effects of implementing the restoration projects considered in the plan. A Finding of No Significant Impact (FONSI) is included in 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 Army Corps of Engineers (COE) 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 COE 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 directs 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 Stated 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 restoration action described in the draft DARP/EA is not expected to adversely impact any species listed as threatened or endangered under the ESA. The Trustees have initiated and completed an informal consultation with the USFWS and NOAA's National Marine Fisheries Service (NMFS) pursuant to the ESA to ensure that the restoration action selected is in accordance with all applicable provisions. Comments received from the USFWS and NMFS were incorporated into the Draft DARP/EA (March 2005) prior to the solicitation of public comment, and correspondence with the USFWS and NMFS is included in Appendix 5.

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

The proposed restoration projects 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, NEPA or other federal permit, license, or review requirements. The proposed restoration projects 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. The crevasse project is expected to have a positive effect in creating EFH. A determination of this finding has been made with NMFS, and the correspondence is included in Appendix 5.

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 proposed restoration project will have no adverse affects 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 November 23, 2004. The Trustees determination and the SHPOs concurrence are included in Appendix 5.

Archeological Resources Protection Act, 16 U.S.C. 470 *et seq*.
The marsh restoration site has been surveyed to determine its value as an archaeological resource. Survey results have been reviewed by the Louisiana Division of Historical and Cultural Programs. The marsh site has been determined to be ineligible for the National Register, and no further study is needed.

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 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 has taken place as required by NEPA.

Executive Order 12962 (60 FR 30,769) – Recreational Fisheries
The proposed 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 proposed restoration project will not cause or promote the introduction or spread of invasive species. The location and elevation of the crevasse splay marsh creation will promote colonization by native species; colonization by invasive species is unlikely.

APPENDIX 3. Summary of public comments: North Pass Oil Spill Draft DARP/EA

No comments were received during the public comment period, which ended on April 19, 2005.

APPENDIX 4. Preparers, agencies, and persons consulted.

National Oceanic and Atmospheric Administration:

Dr. Jim Hoff, Damage Assessment Center, Silver Spring, MD
Dr. Daniel Hahn, Damage Assessment Center, SE Region, St. Petersburg, FL
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
Troy Baker, Damage Assessment Center, Baton Rouge, LA

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 Romaire, Baton Rouge, LA

Louisiana Department of Environmental Quality:

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

APPENDIX 5. Correspondence between USFWS, NMFS, and the LA SHPO

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

November 23, 2004

Eric Hawk
Section 7 Coordinator
Office of Protected Resources
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702-2432

Reference: Ocean Energy/ North Pass Oil Spill Restoration - ESA Section 7 Consultation

Dear Mr. Hawk:

The Natural Resource Trustee agencies: Louisiana Oil Spill Coordinator's Office, Office of the Governor; Louisiana Department of Wildlife and Fisheries; Louisiana Department of Environmental Quality; Louisiana Department of Natural Resources; United States Fish and Wildlife Service, on behalf of the U.S. Department of the Interior; and the National Oceanic and Atmospheric Administration of the U. S. Department of Commerce are proposing the construction of a freshwater diversion/crevasse splay to create marsh habitat on the Delta National Wildlife Refuge (NWR) in Plaquemines Parish, Louisiana.

The aforementioned Natural Resource Trustee agencies have conducted a Natural Resource Damage Assessment and are planning restoration for the North Pass incident in which 300 barrels (12,600 gallons) or more of south Louisiana sweet crude oil was discharged on September 22, 2002 while an aboveground storage tank was being filled. The crevasse splay is compensation for ecological losses caused by the discharge of oil from the storage tank into adjacent marsh habitat.

The crevasse splay will be cut into the right descending bank of Octave Pass in the Delta NWR. The project will be designed and built in a similar manner to the many other crevasse splays that have been constructed in the Delta NWR over the past decade. A complete description of the project and a map is provided in the attached Draft Damage Assessment and Restoration Plan/Environmental Assessment (Draft DARP/EA).

The Trustees anticipate that the project will be constructed by representatives of Devon Energy Corporation with close coordination and oversight by the Natural Resource Trustees and the staff of the Delta NWR.

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Species of Concern:

Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

Historically, the gulf sturgeon occurred from the Mississippi River to Charlotte Harbor, Florida. It still occurs, at least occasionally, throughout this range, but in greatly reduced numbers. Currently, the fish is essentially confined to the Gulf of Mexico.

The threatened gulf sturgeon is an anadromous fish with reproduction occurring in fresh water. River systems where the Gulf sturgeon are known to be viable today include the Mississippi, Pearl, Escambia, Yellow, Choctawhatchee, Appachicola, and Swannee Rivers, and possibly others. Spawning occurs in areas of deeper water with clean (rock and rubble) bottoms, and the fish return to breed in the river system in which they hatched. Most adult feeding takes place in the Gulf of Mexico and its estuaries.

For the gulf sturgeon, dams have been a significant factor in their decline because it blocks their passage to spawning areas. In addition to structures preventing gulf sturgeon from reaching many spawning areas, dredging, de-snagging, and spoil deposition carried out in connection with channel improvement and maintenance represent a threat to the gulf sturgeon.

Pallid sturgeon (*Scaphirhynchus albus*)

Pallid sturgeons were once widely distributed throughout the Mississippi River. However, in the last 50 years, there has been a drastic decline in their abundance over much of their former range due largely to: 1) reservoir construction on the Missouri River for flood control, and 2) the development of a series of 24 locks and dams on the upper Mississippi River to improve commercial navigation. These construction activities have greatly altered the river by lowering flow velocities and greatly reducing turbidity levels; thereby, eliminating spawning habitat, blocking access to remaining spawning sites, and altering availability of prey.

Currently, the pallid sturgeon is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structures); it is also found in the Red River as well. The pallid sturgeon is adapted to riverine conditions that can be described as large, free-flowing, turbid water with a diverse assemblage of physical habitats that are in a constant state of change. Otherwise, detailed habitat requirements of this fish are not known, but it is believed to spawn in Louisiana.

Green, Hawksbill, Kemp's, Leatherback, Loggerhead sea turtle

Endangered and threatened sea turtles forage in the nearshore waters, bays, and sounds of Louisiana; however, sea turtles are not expected to frequent the sites because of the freshwater and turbid character of the river.

Effects to Threatened and Endangered Species

Because the preferred primary restoration alternative is the no action/ natural recovery alternative, the primary restoration alternative is not likely to adversely affect any federally listed threatened or endangered species.

The preferred compensatory alternative for lost ecological services is the creation of a splay marsh by cutting a crevasse through the channel bank along Octave Pass. The crevasse would be excavated with a drag-line bucket type dredge in order to minimize the temporary, localized increase in turbidity of the river at the dredge site. The action would convert the river bank into a small waterway allowing river water and sediments into the open water bay. Because this alternative would result in only minor, temporary impacts to water quality, it is not likely to adversely affect gulf or pallid sturgeon.

Conclusion:

Based on review of the species present in the area and the techniques being used to implement the restoration, the National Oceanic and Atmospheric Administration trustee representative anticipates no adverse effects to threatened or endangered species associated with construction of said crevasse splay.

If the Office of Protected Resources disagrees with this determination and recommends additional conservation measures, please inform this office within 10 days. Please do not hesitate to contact me if you need additional information.

Sincerely,

John Rapp
Marine Resource Habitat Specialist
Damage Assessment and Restoration Program

Attachments

Cc: Troy Baker, NOAA
Ron Gouguet, NOAA
Linda Burlington, NOAA
Gina Muhs Saizan, LOSCO
Administrative Record

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

November 23, 2004

Rickey Ruebsamen
Essential Fish Habitat Coordinator
Habitat Conservation Division
National Marine Fisheries Service
9721 Executive Center Drive North
St. Petersburg, Florida 33702-2432

Reference: Ocean Energy/ North Pass Oil Spill Restoration - EFH Coordination

Dear Mr. Ruebsamen:

The natural resource trustee agencies: Louisiana Oil Spill Coordinator's Office, Office of the Governor; Louisiana Department of Wildlife and Fisheries; Louisiana Department of Environmental Quality; Louisiana Department of Natural Resources; United States Fish and Wildlife Service, on behalf of the U.S. Department of the Interior; and the National Oceanic and Atmospheric Administration, of the U. S. Department of Commerce are proposing the construction of a freshwater diversion/crevasse splay to create marsh habitat on the Delta National Wildlife Refuge in Plaquemines Parish, Louisiana.

The aforementioned Natural Resource Trustee agencies have conducted a Natural Resource Damage Assessment and are planning restoration for the North Pass incident in which 300 barrels (12,600 gallons) or more of south Louisiana sweet crude oil was discharged on September 22, 2002 while an aboveground storage tank was being filled. The crevasse splay is compensation for ecological losses caused by the discharge of oil from the storage tank.

The crevasse splay will be cut into the right descending bank of Octave Pass in the Delta NWR. The project will be designed and built in a similar manner to the many other crevasse splays that have been constructed in the Delta NWR over the past decade. The Trustees anticipate that the projects will be constructed by representatives of Devon Energy Corporation with close coordination and oversight by the Natural Resource Trustees and the staff of the Delta NWR.

A complete description of the project and a map is provided in the attached Draft Damage Assessment and Restoration Plan/Environmental Assessment (Draft DARP/EA). The Draft DARP/EAs provide the basis for a Finding of No Significant Impact for the Ocean Energy/ North Pass Oil Spill restoration project for the purposes of the National Environmental Policy Act (NEPA).

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In addition to the Draft DARP/EA which describes the project, you will also find a more detailed Essential Fish Habitat (EFH) Determination for the crevasse splay project. We believe these documents provide sufficient information to determine that the restoration projects pose no net adverse impacts to EFH.

If the Office of Habitat Conservation disagrees with this determination and recommends additional conservation measures, please inform this office within 10 days. Please do not hesitate to contact me if you need additional information.

Sincerely,

John Rapp
Marine Resource Habitat Specialist
Damage Assessment and Restoration Program

Attachments

Cc: Troy Baker, NOAA
Ron Gouguet, NOAA
Linda Burlington, NOAA
Gina Muhs Saizan, LOSCO
Administrative Record

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

November 23, 2004

Russell Watson
Field Supervisor
Lafayette Field Office
Ecological Services
United States Fish & Wildlife Service
646 Cajundome Blvd., Suite 400
Lafayette, LA 70506

Reference: Ocean Energy/ North Pass Oil Spill Restoration ESA Section 7 Consultation

The Natural Resource Trustee agencies: Louisiana Oil Spill Coordinator's Office, Office of the Governor; Louisiana Department of Wildlife and Fisheries; Louisiana Department of Environmental Quality; Louisiana Department of Natural Resources; United States Fish and Wildlife Service, on behalf of the U.S. Department of the Interior; and the National Oceanic and Atmospheric Administration of the U. S. Department of Commerce are proposing the construction of a freshwater diversion/crevasse splay to create marsh habitat on the Delta National Wildlife Refuge (NWR) in Plaquemines Parish, Louisiana.

The aforementioned Natural Resource Trustee agencies have conducted a Natural Resource Damage Assessment and are planning restoration for the North Pass incident in which 300 barrels (12,600 gallons) or more of south Louisiana sweet crude oil was discharged on September 22, 2002 while an aboveground storage tank was being filled. The crevasse splay is compensation for ecological losses caused by the discharge of oil from the storage tank.

The crevasse splay will be cut into the right descending bank of Octave Pass in the Delta NWR. The project will be designed and built in a similar manner to the many other crevasse splays that have been constructed in the Delta NWR over the past decade. Additionally, NWR personnel will be provided and opportunity to comment on the design, as well as the method and timing of construction. A complete description of the project and a map is provided in the attached Draft Damage Assessment and Restoration Plan/Environmental Assessment (Draft DARP/EA).

The Trustees anticipate that the projects will be constructed by representatives of Devon Energy Corporation with close coordination and oversight by the Natural Resource Trustees and the staff of the Delta NWR.

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Based on the attached review, the species present in the area, and the techniques being used to implement the restoration, the trustees anticipate no adverse effects to threatened or endangered species associated with construction of said crevasse.

If the U.S. Fish and Wildlife Service disagrees with this determination and recommends additional conservation measures, please inform this office within 15 days. Please do not hesitate to contact me if you need additional information.

Sincerely,

John Rapp

John Rapp
Marine Habitat Resource Specialist
Damage Assessment and Restoration Program

Attachments

Cc: Troy Baker
Ron Gouguet
Linda Burlington
Gina Muhs Saizan
Administrative Record
James Harris
Jack Bohannon
Buddy Goatcher

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

Southeast Regional Office
9721 Executive Center Dr. N.
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517
http://sero.nmfs.noaa.gov

NOV 29 2004

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 dated November 23, 2004, and enclosed November 2004 Draft Damage Assessment and Restoration Plan/Environmental Assessment ("EA") for the September 22, 2002, Oil Spill at North Pass in the Mississippi River Delta, Plaquemines Parish, Louisiana. The National Marine Fisheries Service (NOAA Fisheries), Protected Resources Division (PRD) received your submission on November 26, 2004. You requested our review and comments on the project and EA.

PRD believes the EA adequately addresses the issues associated with threatened and endangered species under NOAA Fisheries' 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.

Sincerely,

David Bernhart
Assistant Regional Administrator
for Protected Resources

File: 1514-22.E. NOAA
Ref: I/SER/2004/01746

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

Southeast Regional Office
9721 Executive Center Drive N
St. Petersburg, Florida 33702
(727) 570-5317, FAX (727) 570-5300
http://sero.nmfs.noaa.gov/

December 3, 2004 F/SER4:DD

MEMORANDUM FOR: John Rapp
Damage Assessment and Restoration Program

FROM: Miles M. Croom for
Assistant Regional Administrator, Habitat Conservation Division

SUBJECT Essential Fish Habitat (EFH) Consultation for the Draft Damage Assessment and Restoration Plan/Environmental Assessment for the North Pass Louisiana Oil Spill of September 2002

This responds to your November 23, 2004, request for an EFH review of the subject action. The preferred project alternative to compensate for marsh injuries is the creation of an approximately four acre crevasse splay in the Delta National Wildlife Refuge. As specified in the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), EFH consultation is required for federal actions which may adversely affect EFH. As the federal action agency in this matter, the Restoration Center, on behalf of the natural resource trustees for this incident, has determined that the proposed creation of a crevasse splay and resultant marsh habitat would not have a net adverse affect on EFH and, overall, would benefit some estuarine dependent fisheries managed by the Gulf of Mexico Fishery Management Council. Since any adverse effects on EFH are likely to be minimal and temporary, the HCD has no EFH Conservation Recommendations to provide pursuant to Section 305(b)(2) of the MSFCMA.

If we can be of further assistance, please advise. Should you have any questions please contact David Dale at 727/570-5317 or at David.Dale@noaa.gov.

cc: F/SER44-Hartman
File

United States Department of the Interior

FISH AND WILDLIFE SERVICE
646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

December 14, 2004

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 November 23, 2004, letter requesting our review of the draft Damage Assessment and Restoration Plan (DARP) for the North Pass "incident" which occurred on September 22, 2002, at Ocean Energy's storage and transfer facility in Plaquemines Parish, Louisiana. A December 6, 2004, letter, which further analyzed the affects the preferred primary restoration alternative and the preferred compensatory alternative may have on Federally listed threatened and endangered species was subsequently received by our office. The U.S. Fish and Wildlife Service (Service) has reviewed the information provided, and offers the following comments in accordance with provisions of the National Environmental Policy Act (NEPA) of 1969 (83 Stat. 852, as amended; 42 U.S.C. 4321 et seq.), and the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

The draft DARP is well written, well organized, and provides an adequate description of fish and wildlife resources in the project area. To compensate for ecological losses caused by the discharge of approximately 300 barrels of oil from the storage and transfer facility, the Natural Resource Trustee agencies (Trustees) are proposing to construct a freshwater diversion/ crevasse splay to create marsh habitat on the Service-administered Delta National Wildlife Refuge (NWR) in Plaquemines Parish, Louisiana. According to your letter, coordination will be conducted with Delta NWR personnel. The Trustees and responsible party estimated that approximately 120 acres of marsh habitat had been injured due to the incident. Using the Habitat Equivalency Analysis (HEA) model, marsh service loss due to the incident was quantified as 48.92 discount service acre-years. Furthermore, based on input from resource agency biologists, data from other damage assessment cases, information from scientific literature, and using a three percent annual discount rate, the Trustees determined that each crevasse splay acre provides a credit of 12.31 discounted service acre-years. Therefore, an area of 4.00 acres at the preferred selected restoration site will compensate for the loss of 48.92 discount service acre-years.

Of the 85 initial restoration proposals, which included a no action/natural recovery option, the preferred restoration alternative was selected because of the high level of service, cost-effectiveness, high likelihood of success, and proximity to the injured area associated with the incident. According to the DARP, any impacts to the existing environment are expected to be small. Moreover, the potential long-term environmental benefits associated with this marsh creation project, including providing habitat for juvenile fishes, exporting detritus into the estuary, and increasing water quality, would significantly outweigh initial project construction-related impacts.

The December 6, 2004, letter describes potential affects the preferred primary restoration alternative may have on Federally listed threatened and endangered species. That proposed alternative is a natural recovery alternative that requires no action. Because no impacts would occur should this alternative be implemented, the Service concurs with your determination that the proposed project is not likely to adversely affect Federally listed threatened or endangered species.

The December 6, 2004, letter further describes in detail the potential affects the preferred compensatory restoration alternative may have on the endangered West Indian manatee (*Trichechus manatus*), the endangered brown pelican (*Pelecanus occidentalis*), the threatened piping plover (*Charadrius melodus*) and its critical habitat, the threatened bald eagle (*Haliaeetus leucocephalus*), the threatened gulf sturgeon (*Acipenser oxyrhynchus desotoi*), the endangered pallid sturgeon (*Scaphirhynchus albus*), and several species of sea turtles. The Service recommends that both analyses be included in the DARP under Chapter 3: 3.1.1 (Affected Environment, Physical and Biological Environment, Threatened and Endangered Species).

West Indian manatees 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. According to your letter, an observer would watch for the occurrence of manatees around the project area during the summer months to ensure that collisions are avoided. Because this precaution would be taken during the construction of the crevasse splay, the Service concurs with your determination that the proposed project is not likely to adversely affect the West Indian manatee.

Brown pelicans 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. Brown pelicans feed along the Louisiana coast in shallow estuarine waters, using sand spits and offshore sand bars as rest and roost areas. The proposed project is located approximately five miles from the closest known brown pelican rookery. Furthermore, although construction of the crevasse splay would cause temporary impacts to the existing feeding and foraging habitat, additional beneficial brown pelican habitat would be created. Because these impacts are temporary and no known rookeries

are located near the project area, the Service concurs with your determination that the proposed project is not likely to adversely affect the brown pelican.

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. Their designated critical habitat includes 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. According to your letter, the proposed project is located approximately 24 miles northwest of designated piping plover critical habitat. Additionally, although construction of the crevasse splay would cause temporary impacts to the existing habitat, there is ample habitat in the area to support any displaced birds, and additional beneficial piping plover habitat would be created. Therefore, the Service concurs with your determination that the proposed project is not likely to adversely affect the piping plover or its critical habitat.

Bald eagles nest in Louisiana from October through mid-May. Eagles typically nest in bald cypress trees near fresh to intermediate marshes or in open water in the southeastern Parishes. Areas with high numbers of nests include the Lake Verret Basin south to Houma, the southern marsh/ridge complex from Houma to Bayou Vista, the north shore of Lake Pontchartrain, and the Lake Salvador area. Eagles also winter and infrequently nest near large lakes in central and northern Louisiana. The proposed project area is located within the Delta NWR and along the right descending bank of Octave Pass, which is composed saline marsh vegetation. While this area may be potential feeding habitat for bald eagles, potential nesting habitat does not occur near the project area. Because of the size of the project area, project-related impacts to bald eagle feeding habitat are expected to be insignificant. Accordingly, the Service concurs with your determination that the proposed project is not likely to adversely affect the bald eagle.

The Gulf sturgeon is an anadromous fish that occurs in many rivers, streams, and estuarine waters along the northern Gulf coast between the Mississippi River and the Suwanee River, Florida. In Louisiana, Gulf sturgeon have been reported at Rigolets Pass, rivers and lakes of the Lake Pontchartrain basin, and adjacent estuarine areas. Spawning occurs in coastal rivers between late winter and early spring (i.e., March to May). According to your letter, the crevasse would be excavated with a suction dredge, which should minimize the temporary localized increase in turbidity. Additionally work would be conducted along the river bank rather than along the deeper portions of the river channel. Because the proposed impacts are confined to a small area along the bank and within the marsh behind the bank, and impacts to water quality (i.e., turbidity) are temporary, the Service concurs with your determination that the proposed project is not likely to adversely affect the Gulf sturgeon.

The pallid sturgeon is an endangered fish found in both the Mississippi and Atchafalaya Rivers (with known concentrations in the vicinity of the Old River Control Structure Complex); it is possibly found in the Red River as well. The pallid sturgeon is adapted to large, free-flowing, turbid rivers with a diverse assemblage of physical characteristics that are in a constant state of

change. According to your letter, the crevasse would be excavated with a suction dredge, which will minimize the temporary localized increase in turbidity. Additionally work would be conducted along the river bank rather than along the deeper portions of the river channel. Because the proposed impacts are confined to a small area along the bank and within the marsh behind the bank, and impacts to water quality (i.e., turbidity) are temporary, the Service concurs with your determination that the proposed project is not likely to adversely affect the pallid sturgeon.

Endangered and threatened sea turtles forage in the nearshore waters, bays and sounds of Louisiana. The NMFS is also responsible for consultation regarding these aquatic marine threatened or endangered species. Please contact Eric Hawk (727/570-5312) in St. Petersburg, Florida, for information concerning those species in the aquatic environment.

No further endangered species consultation with the U.S. Fish and Wildlife Service would be required for this action, unless there are changes in the scope or location of the proposed project or the project has not been initiated within one year. If the proposed project has not been initiated within one year, follow-up consultation should be accomplished with the Service prior to making expenditures because our threatened and endangered species information is updated annually. If the scope or location of the proposed project is changed, consultation should occur as soon as such changes are made.

We appreciate the opportunity to provide comments regarding the proposed project. If you have any questions regarding our comments, please contact Angela Culpepper (337/291-3137) of this office.

Sincerely,

Russell C. Watson
Supervisor
Louisiana Field Office

cc: LDWF, Natural Heritage Program, Baton Rouge, LA
Delta NWR, Bayou Lacombe Centre, Lacombe, LA

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

Pamela Breaux
State Historic Preservation Officer
Office of Recreation, Culture and Tourism
Division of Archaeology
Post Office Box 44247
Baton Rouge, Louisiana 70804

November 23, 2004

RE: National Historic Preservation Act, Section 106, concurrence request

Dear Ms. Breaux

The National Oceanic and Atmospheric Administration's Restoration Center is the lead federal agency overseeing the restoration planning, engineering and other pre-construction activities associated with the implementation of a crevasse splay project (Figure 1) in the U.S. Fish and Wildlife operated Delta National Wildlife Refuge in Plaquemines Parish, LA. The project entails cutting (*i.e.* dredging) through the right descending bank (levee) of Octave Pass to allow for the flow of sediment-laden Mississippi River water into a shallow receiving basin (Brant Island). When the water enters and resides in the receiving basin, sediment will settle out of the water column and build land that will be colonized by native vegetation. The coordinates of the project are 865698.83 E and 3236243.92 N (UTM, NAD 83). 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 September 22, 2002.

On November 22, 2004, I participated in an informal consultation with Ms. Cheraki Williams of your staff. Our inspection of the maps on file in the Division of Archeology revealed that no recorded sites exist in the 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 project construction area that we may not have considered during the informal consultation. If you agree with our determination that the project will not affect cultural resources or registered historic places, please provide us with correspondence indicating your concurrence.

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

John Rapp

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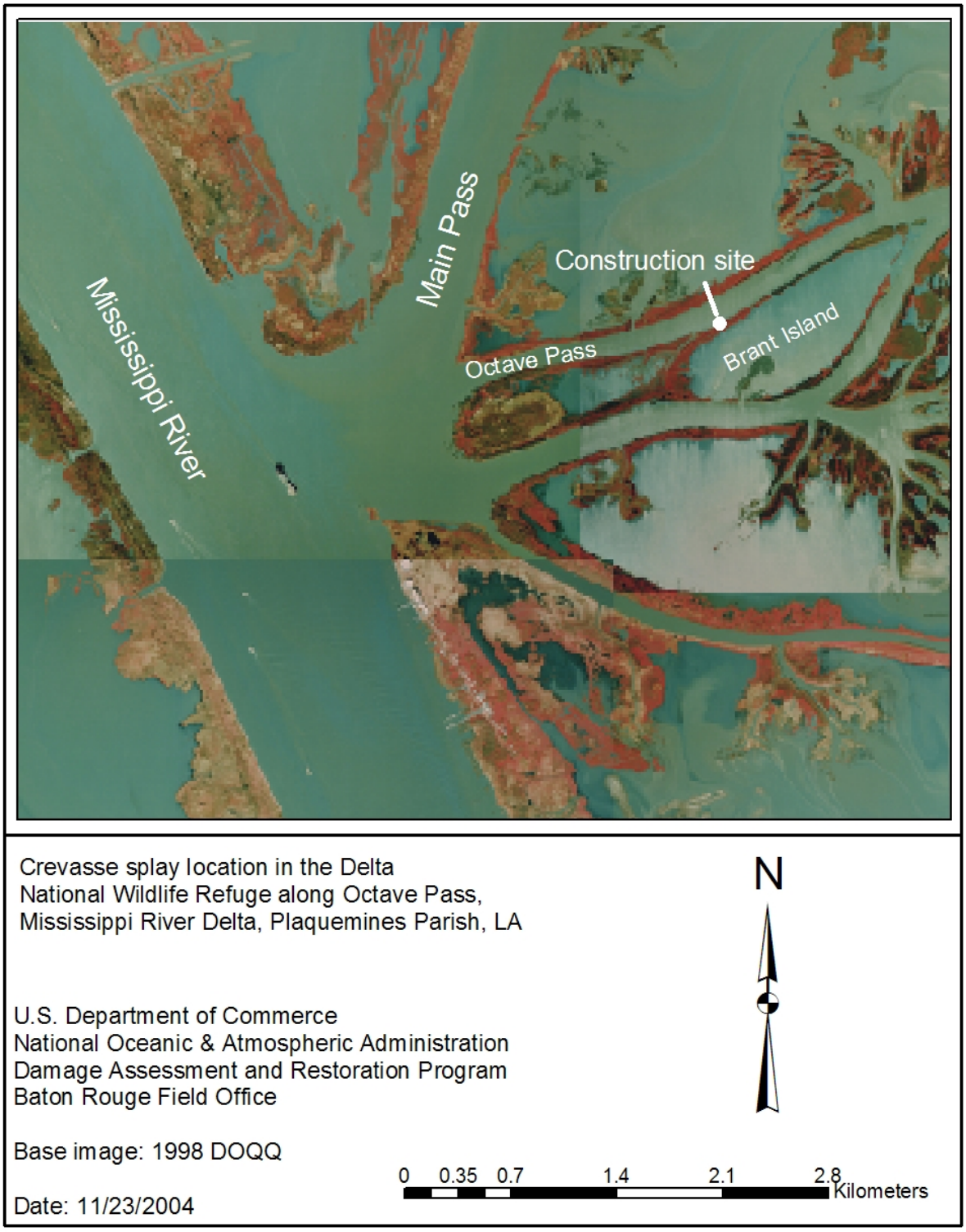

Figure 1. The proposed location of a crevasse splay in the Delta National Wildlife Refuge.

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

Pamela Breaux
State Historic Preservation Officer
Office of Recreation, Culture and Tourism
Division of Archaeology
Post Office Box 44247
Baton Rouge, Louisiana 70804

Date: 12-20-04
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

November 23, 2004

RE: National Historic Preservation Act, Section 106, concurrence request

Dear Ms. Breaux:

The National Oceanic and Atmospheric Administration's Restoration Center is the lead federal agency overseeing the restoration planning, engineering and other pre-construction activities associated with the implementation of a crevasse splay project (Figure 1) in the U.S. Fish and Wildlife operated Delta National Wildlife Refuge in Plaquemines Parish, LA. The project entails cutting (*i.e.* dredging) through the right descending bank (levee) of Octave Pass to allow for the flow of sediment-laden Mississippi River water into a shallow receiving basin (Brant Island). When the water enters and resides in the receiving basin, sediment will settle out of the water column and build land that will be colonized by native vegetation. The coordinates of the project are 865698.83 E and 3236243.92 N (UTM, NAD 83). 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 September 22, 2002.

On November 22, 2004, I participated in an informal consultation with Ms. Cheraki Williams of your staff. Our inspection of the maps on file in the Division of Archeology revealed that no recorded sites exist in the 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 project construction area that we may not have considered during the informal consultation. If you agree with our determination that the project will not affect cultural resources or registered historic places, please provide us with correspondence indicating your concurrence.

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

John Rapp

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DIV. OF ARCHAEOLOGY

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APPENDIX 6. 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 be reasonably expected to have a substantial adverse impact on public health or safety? *No. The selected restoration project is designed to enhance habitat and be beneficial to the environment. No adverse impacts on public health and safety are expected.*

2) 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 5.7.5 and Appendix 2, and concurred with in Appendix 5, the selected restoration project is not expected to adversely affect endangered or threatened species. Consultation with the USFWS and NOAA's National Marine Fisheries Service (NMFS) pursuant to the ESA ensures that the selected restoration action is in accordance with all applicable provisions.*

3) To what degree are the effects on the quality of the human environment likely to be highly controversial? *Effects on the quality of the human environment are not expected to be controversial. Similar projects in the region have not been controversial.*

4) 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. Cultural and historical resources are not going to be impacted by the selected restoration project. The crevasse splay project is designed to enhance freshwater/brackish marsh habitat within Delta National Wildlife refuge. The project location has been selected to minimize any potential negative impacts on park land while increasing habitat for fish and wildlife.*

5) To what degree are the effects on the human environment likely to be uncertain or involve unique or unknown risks? *Unique or unknown risks to the human environment are unlikely. Creating crevasse splays is a proven technique with established methods and documented results. Local, state, and federal agencies have successfully implemented similar projects in this region of the modern Mississippi (Belize) Delta.*

6) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts? *No. 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.*

7) 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 stated and concurred with in Appendix 5, the selected 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.*

8) 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 crevasse splay marsh creation will promote colonization by native species; colonization by invasive species is unlikely.*

9) 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. The selected action is not expected to have a precedent setting effect on future actions that may significantly affect the human environment.*

10) 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 2.1.4, the selected restoration project will comply with all Federal, State, and local law requirements and is expected to enhance habitat and protect the environment.*

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

DETERMINATION

In view of the information presented in this document and the analysis contained in the attached Environmental Assessment prepared for the crevasse splay restoration project at Octave Pass, it is hereby determined that this restoration project will not significantly impact the quality of the human environment as described above and in the Environmental Assessment. In addition, all impacts to potentially affected areas, including national, regional, and local, have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an EIS for this action is not necessary.

John Oliver

Date 7-12-05

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