

**U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SILVER SPRING, MARYLAND**

**ENVIRONMENTAL ASSESSMENT OF
FOUR-MILE CANAL TERRACING AND SEDIMENT TRAPPING PROJECT**

CWPPRA PROJECT TV-18

VERMILION PARISH, LOUISIANA

March 2003

Table of Contents

Environmental Assessment of Four-Mile Canal Terracing and Sediment Trapping Project

Section

1.0 INTRODUCTION	5
1.1 Technical Background	5
1.2 Project Location	8
1.3 Project Funding	8
2.0 PURPOSES AND NEED FOR ACTION	8
2.1 Purpose	8
2.2. Need for Action	9
2.2.1 Release of Natural Wetland Creation Processes	9
2.2.2 Protection of Existing Wetlands	9
2.2.3 Protection of Wildlife Habitat	10
2.2.4 Protection of Marine Fisheries Habitats	10
2.2.5 Protection of Infrastructure	10
2.3 Authorization	11
3.0 ALTERNATIVE INCLUDING PROPOSED ACTION	11
3.1 No-Action	11
3.2 Non-vegetated Terraces without Distributary Network	12
3.3 Vegetated Terraces without Distributary Network	12
3.4 Non-Vegetated Terraces with Distributary Network	12
3.5 Preferred Alternative	12
3.5.1 Distributary Network	13
3.5.2 Terraces	13
3.5.3 Vegetative Plantings	14
4.0 AFFECTED ENVIRONMENT	14
4.1. Physical Environment	14
4.1.1 Geology, Soils, and Topography	14
4.1.2 Climate and Weather	15
4.1.3 Air Quality	16
4.1.4 Surface Water Resources	16
4.2. Biological Environment	16
4.2.1 Vegetative Communities	16
4.2.2 Essential Fish Habitat.....	17

4.2.3 Fish and Wildlife Resources	17
4.2.4 Threatened and Endangered Species	18
4.3. Cultural Environment	19
4.3.1 Historical or Archeological Resources	19
4.3.2 Economics (Employment and Income)	20
4.3.3 Land Use	20
4.3.4 Recreation	20
4.3.5 Noise	21
4.3.6 Infrastructure	21
5.0 ENVIRONMENTAL CONSEQUENCES	21
5.1. Physical Environment	22
5.1.1 Geology, Soils, and Topography	22
5.1.2 Climate and Weather	23
5.1.3 Air Quality	23
5.1.4 Surface Water Resources	23
5.2. Biological Environment	24
5.2.1 Vegetative Communities	24
5.2.2 Essential Fish Habitat.....	24
5.2.3 Fish and Wildlife Resources	25
5.2.4 Threatened and Endangered Species	26
5.3. Cultural Environment	26
5.3.1 Historical or Archeological Resources	26
5.3.2 Economics (Employment and Income)	26
5.3.3 Land Use	26
5.3.4 Recreation	26
5.3.5 Noise	26
5.3.6 Infrastructure	27
6.0 CONCLUSIONS	27
7.0 PREPARERS	27
8.0 FINDING OF NO SIGNIFICANT IMPACT	28
9.0 LITERATURE CITED	29
Appendix A Agency Coordination Letters	40

LIST OF FIGURES

Figure 1	Regional Map.....	35
Figure 2	Parish Map	36
Figure 3	Project Plan Map (Little Vermilion Bay).....	37
Figure 4.	Project Plan Map (Little White Lake).....	38
Figure 5	Terrace and Borrow Canal Cross Sections.....	39

Environmental Assessment
Four-Mile Canal Terracing and Sediment Trapping Project
Vermilion Parish, Louisiana

1.0 INTRODUCTION

This Environmental Assessment (EA) evaluates the impacts of activities to enhance wetlands in and around the eastern end of Little Vermilion Bay at its junction with Four Mile Canal (also known as the Vermilion River Cutoff) (Figure 1). The project is called Four Mile Canal Terracing and Sediment Trapping and is located in southeastern Vermilion Parish, Louisiana (Figure 2).

This project is funded under the auspices of the Coastal Wetlands Planning, Protection, and Restoration Act (CWPPRA) of 1990 (16 U.S.C. §§ 777c, 3951-3956). In accordance with CWPPRA, the heads of five Federal agencies and the Governor of the State of Louisiana comprise a Task Force to implement a "comprehensive approach to restore and prevent the loss of coastal wetlands in Louisiana" (16 U.S.C. § 3952.(b) (2)). The five Federal agencies involved are: the U.S. Army Corps of Engineers (COE); the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS); the U.S. Department of Interior, Fish and Wildlife Service (FWS); the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS); and the U.S. Environmental Protection Agency (EPA). Four-mile Canal Terracing and Sediment Trapping Project is on the ninth Priority Project List, approved by the CWPPRA Task Force on February 28, 2000 (LDNR 1999c), and will soon be ready for construction.

1.1 Technical Background

The Louisiana coastal zone contains approximately 3,200,000 ha (7,900,000 acres) of which about 1,200,000 ha (3,000,000 acres) are coastal marshes. These marshes convert to shallow open water at a rate of 9,039 ha/yr (34.9 mi²/yr) (Barras et al., 1994). The site-specific factors influencing conversion of marsh to open water vary widely and are difficult to assess, but natural as well as anthropogenic factors are responsible.

A most important process in landscape dynamics in coastal Louisiana is the delta lobe cycle (Coleman 1988). This cycle consists of natural periods of wetland creation and wetland loss. Natural wetland loss results from compaction and subsidence of deltaic deposits, eustatic sea level rise, physical substrate scouring, and erosion exacerbated by periodic tropical cyclonic storms (Craig et al., 1979; Boesch et al.,

1983). Herbivory may also accelerate wetland loss (Nyman et al., 1993).

In addition to natural processes, human activity also causes wetland loss, through increasing natural loss processes and by creating new causes of marsh degradation. Anthropogenic activity accounted for 26 percent of total wetland loss within Louisiana between 1955 and 1978 (Turner and Cahoon, 1988). These direct losses were caused by dredging canals and creating spoil-banks, draining land, and expanding agricultural and urban areas. Human activity also causes wetland loss indirectly. Turner and Cahoon (1988) attribute indirect causes of wetland loss to five interrelated effects. These include temporal trends in estuarine salinity, saltwater intrusion in waterways, saltwater movement in marshes, plant responses to salinity change and submergence, and subsidence, water level rise and sediment deprivation. Indirect losses were exacerbated by levee construction for flood protection along the Mississippi River (Templet and Meyer-Arendt, 1988), extensive canal construction associated with oil and gas exploration (Turner et al., 1982), and navigation channel development and maintenance dredging. These large scale perturbations altered hydrological conditions and sediment distribution over large areas and facilitated saltwater intrusion into coastal marshes. Within the project area, the four major causes of hydrologic alteration since the early 1950's have been the construction of the major canals (GIWW, Freshwater Bayou Canal and Four-Mile Canal), and increased flow down the Atchafalaya River (LDNR 1999b)

As part of the delta lobe cycle, the Mississippi River began shifting into the Atchafalaya River early in the last century. In 1900, the Atchafalaya River received 13 percent of the Mississippi River's flow at the point of convergence near Simmesport, Louisiana,, approximately 70 miles northeast of Lafayette, Louisiana (Morgan et al., 1953). By 1952, the Atchafalaya River had captured 30 percent of the Mississippi's flow. In 1963, flow from the Mississippi River into the Atchafalaya River was regulated by the construction of the Old River Control Structure near Simmesport, Louisiana to prevent completion of the channel switching. Even with this structure, sediment deposition is converting shallow open water to wetlands in the lower Atchafalaya Basin (Adams and Baumann, 1980), Atchafalaya Bay (van Heerden et al., 1981), and on the downdrift coast of the Gulf of Mexico (Wells and Kemp 1981, Orton 1959). The Gulf Intracoastal Waterway (GIWW) has become a conduit carrying sediment-rich waters from the Atchafalaya River west to West Cote Blanche Bay (CEI 1977), Vermilion Bay, and Little Vermilion Bay. The Four-mile Canal and Vermilion River branches off from the GIWW in a southerly direction carrying sediment toward Vermilion Bay. Some sediment is carried

into the project area from the western end of Four-Mile Canal as well as the Vermilion River. Subaqueous deltas are developing where confined flow from the canals slows and spreads upon entry into Little Vermilion Bay (CEI 1977).

Navigation charts indicate that water depth in Little Vermilion Bay was 0.9-1.5 m (3-5 ft) in the 1960's, but currently ranges from 0.3-0.9 m over much of the project area (1-3 ft) (Foret, personal communication). A recent survey however, shows that depths in eastern Little Vermilion Bay range from 0.45-1.74 m (1.5-5.7 feet), slightly deeper than encountered in the the nearby Little Vermilion Sediment trapping project. Little White Lake ranges from 1.6-4.5 ft. Subaqueous deltas are known to be developing in Little Vermilion Bay where confined flow from the GIWW is delivered to the bay by canals (Freshwater Bayou and Four-mile Canal) and the Vermilion River (Foret, Nyman and McTigue, 1998) (Figure 2). The subaqueous levees indicate that Four-mile Canal is functioning as a distributary network carrying sediment to the open bay. These subaqueous deltas are expected to convert to subaerial deltas within 20-30 years. Subaqueous deltas also exist where the Vermilion River connects with Little Vermilion Bay at Little White Lake (Figure 3). If the resulting delta lobes become subaerial, they would directly create wetlands as they are colonized by emergent wetland plants and indirectly slow shoreline erosion of existing wetlands by reducing wave energy in the bay. The size of the deltas is expected to be fairly small because of the size of the channels carrying confined flow and the small sediment load compared to deltas at the mouth of the Atchafalaya and Mississippi Rivers.

There have been few documented studies within the Little Vermilion Bay. Previous studies include background information and engineering reports from restoration projects in the area, including an EA for the Little Vermilion Bay Sediment Trapping project (CWPPRA Project TV-12, PTV-19)(Foret, Nyman, and McTigue, 1998). Engineering reports for Little Vermilion Bay Sediment Trapping project contain soil data, including stratigraphic (soil boring) samples taken near the Four-Mile project area (PENSCO 1998, 2000). A progress report for the Vermilion River Cutoff (project #TV-03-MSPR-0297-2), a CWPPRA-sponsored shoreline protection/rip-rap project along Four-Mile canal is also available (LDNR, 1997b).

More data from nearby regions are becoming available that are relevant to the proposed project. Sediment diversions have been used to induce wetland creation in the Atchafalaya Sediment Delivery Project and are a common and effective method of inducing wetland creation at the mouth of the Mississippi River (LDNR 1996a, Boyer et al. 1997). Terraces have been used to create wetlands in coastal

Louisiana and are particularly effective at increasing the length of marsh/water interface (LDNR 1993). Furthermore, Shell Oil Company constructed terraces in front of properties managed by Vermilion Land Corporation, adjacent to the project area. Some terraces were planted with vegetation, while others were not. After 13 months, those that were vegetated continued to be colonized by additional vegetation but the unvegetated terraces eroded away (Edwards, personal communication). Vegetative plantings have been used to slow shoreline erosion with varying success in coastal Louisiana. Plantings on the Gulf of Mexico have been unsuccessful (LDNR 1996b) whereas plantings on the shoreline of Vermilion Bay have been very successful (LDNR 1997a) as have been plantings on dredged terraces (LDNR 1993).

1.2 Project Location

The project area includes Little Vermilion Bay just west of Four Mile Canal and Little White Lake (Figure 2). Four-Mile Canal is located on the eastern end of Little Vermilion Bay, a shallow western extension of Vermilion Bay, located in Vermilion Parish. The canal connects the GIWW directly to Vermilion Bay, providing a shortcut for commercial boat traffic. The project is centered at approximately 29°45'00"N, 92°08'00"W. Onion Lake was included in the original project proposal but has now been excluded from the project because of wetland mitigation activities undertaken in the area by a private company.

1.3 Project Funding

Eighty-five percent on the funding for this project is provided through the CWPPRA Task Force with 15 percent cost sharing by LDNR. The project is administered by cooperative agreements between NMFS and the LDNR.

2.0 PURPOSE AND NEED FOR ACTION

2.1 Purpose

The goal of CWPPRA is to "restore and prevent the loss of coastal wetlands in Louisiana." The purposes of this project are (1) to directly create wetlands through the placement of dredged material, (2) to increase the amount of wetlands created by natural sediment deposition where confined flow of Atchafalaya River water enters Little Vermilion Bay via Four Mile Canal, (3) to increase percent cover of submersed aquatic vegetation in the project area, (4) to increase

fisheries utilization of the project area, and (5) protect existing wetlands bordering the canal and bay from erosion.

2.2 Need For Action

There is a critical need to create new wetlands that will offset marsh loss in coastal Louisiana. There is also a critical need to slow the loss of existing wetlands. The proposed action provides a unique opportunity to address both needs.

2.2.1 Release of Natural Wetland Creation Processes

Natural coastal wetland creation, which was faster than natural wetland loss until early this century when the Mississippi River was managed for flood-control and navigation (Coleman 1988), has virtually ceased except for 1,158 ha created by the river at the Wax Lake Outlet and Atchafalaya River since 1973 (Evers et al. 1998). Thus, no net loss cannot be achieved in coastal Louisiana simply by ending human induced wetland loss because natural wetland loss associated with the delta lobe cycle continues (Coleman 1988, Penland and Suter 1990). Measures to enhance natural wetland creation processes, such as sediment diversions used elsewhere in coastal Louisiana (LDNR 1996a, Boyer et al. 1997) are needed. Such measures are particularly critical where wetland development processes are constrained by artificial navigation channels as they are in Little Vermilion Bay.

2.2.2 Protection of Existing Wetlands

Recent erosion rates in Little Vermilion Bay of 2.4 m/yr (8 ft/yr) are expected to continue, causing the loss of emergent wetlands surrounding the bay. Along Four Mile Canal, the erosion rate was even higher at 23.3 ft/yr along the canal's west bank between 1955 and 1985 (LDNR, 1997b). According to the Coast 2050 Plan, the Vermilion Bay Marsh area (Region 3), lost 0.45% of its total marsh area yearly between 1974 and 1990 (LDNR, 1999a). If loss continues at this rate, the Vermilion Bay Marsh unit is expected to lose 13,560 acres or 18.5% of the extant marsh by the year 2050 (LDNR, 1999a). The loss of intermediate marsh in the Louisiana coastal zone from 1956 to the present represents a significant natural resource loss. Intertidal marshes are among the most productive ecosystems on earth and their rapid disappearance may significantly impact the economy of South Louisiana. Action is therefore needed to provide immediate protection to existing wetlands.

2.2.3 Protection of Wildlife Habitat

Lack of wetland creation and continued wetland loss reduce habitat availability for many wildlife species in the project area and coastwide. The project area consists primarily of shallow, open water, which is utilized by few wildlife species, particularly when there is little submersed aquatic vegetation (SAV) as in the project area. Wetland loss increases the availability of shallow open water by approximately 9,039 ha/yr (34.9 mi²/yr) in coastal Louisiana (Barras et al., 1994). The project area also contains emergent wetlands, which are heavily utilized by wildlife because they are intermediate marshes, which provide higher quality habitat than brackish and saline marsh for raccoon (*Procyon lotor*), puddle ducks (*Anas* sp.), and alligator (*Alligator mississippiensis*) (Palmisano 1973, McNease and Joanen 1978). Protection of Migratory Bird habitat is enhance for some species in accordance with EO 13186 of January 10, 2001. Reversing declines in habitat availability for wetland wildlife species requires creating new emergent wetlands, protecting existing wetlands from erosion, and increasing the abundance of SAV.

2.2.4 Protection of Marine Fisheries Habitat

The Vermilion Bay complex provides significant estuarine habitat for marine-transient and resident fishery species, but has a relatively low length of interface between emergent wetlands and shallow open water. Interface areas are particularly valuable to estuarine dependent fish and crustacean species (Minello and Rozas 2002). This estuary, near the Gulf of Mexico spawning areas, provides nursery and foraging habitats that support the production of commercial and recreational fish and shellfish. Vermilion Bay along with West Cote Blanche Bay, East Cote Blanche Bay, and Atchafalaya Bay, forms one of the most extensive Louisiana estuarine complexes. Actions are therefore needed to replace marshes that are converting to shallow open water elsewhere in coastal Louisiana.

2.2.5 Protection of Infrastructure

Four-mile canal provides a shortcut for ships going from the GIWW to Vermilion Bay. However, the west bank of Four Mile Canal, bordering Little Vermilion Bay, lost 23.3 ft/yr of shoreline between 1955 and 1985 (LDNR, 1997b)(See also Section 2.2.2). The east bank of the canal has been stabilized with rip-

rap by the Vermilion River Cutoff Project (LDNR Project TV-03). Construction of terraces will protect Four-mile Canal from further erosion. Intracoastal City, bordering the project area to the north, will increasingly be exposed to storm surges and/or hurricanes with the continued loss of wetland buffer in Little Vermilion Bay. Establishment of terraces within the bay will slow that loss and reestablish buffer area protecting this important shipping port.

2.3 Authorization

NMFS is the federal sponsor for implementing this sediment-trapping project that is included on the Ninth Priority Project List (LDNR 1999b). This responsibility includes conducting the evaluation and other activities involved for final decision-making in compliance with the National Environmental Policy Act (NEPA) of 1969. To meet NEPA compliance requirements environmental documentation must be prepared for each wetland project site that is modified or restored.

The Four-Mile Canal Terracing and Sediment Trapping Project will use sediment diversion, distributary channel and terrace construction, and vegetative plantings to create and/or protect 75 ha (187 acres) of emergent wetlands (LDNR 1999b).

3.0 **ALTERNATIVES INCLUDING PROPOSED ACTION**

The project site and scope were identified by NMFS as part of Task Force submittals on the Ninth Priority Project List. This project is one of three new CWPPRA projects in the Teche-Vermilion Basin, and the 11th for the basin overall. The recognition that artificial channels leading from the GIWW into Little Vermilion Bay are functioning as distributary channels stimulated interest in designing a plan to enhance sediment deposition and wetland creation by these artificial channels. Consequences of the proposed action are discussed in Section 5.0.

3.1 No-Action Alternative

The no-action alternative would allow current shoreline erosion rates to continue. The no-action alternative would thus fail to protect existing wetlands that provide and protect other resources in Louisiana. The no-action alternative would also postpone, and possibly reduce, the area of wetlands created by natural sediment deposition in Little Vermilion Bay. The no-action alternative was not the preferred alternative because of the public need to create new coastal marshes to offset losses elsewhere and to protect existing coastal marshes as evidenced by the public funding through the CWPPRA.

3.2 Non-Vegetated Terrace without Distributary Network Alternative

This alternative could temporarily reduce wave energies, and thus temporarily reduce erosion of existing wetlands. However, with the wave-wind energy, it is unlikely that the terraces would last long enough to be colonized by vegetation (Edwards, *personal communication*). This would then re-expose fragile shoreline to erosion. Furthermore, dredging and construction of terraces without considering the natural distributary network could destroy development of that system and hence prevent natural wetland development expected to eventually occur in the bay. This alternative was rejected because of the likely damage to delta development processes operating in Little Vermilion Bay.

3.3 Vegetated Terrace without Distributary Network Alternative

Construction of vegetated terraces without regards to the distributary network in the bay was considered. This alternative could reduce wave energies and thereby slow the erosion of exiting wetlands that border the bay. However, dredging and construction of terraces without considering the natural distributary network developing in the bay could stop development of that system and hence prevent natural wetland development expected to eventually occur in the bay. This alternative was also rejected because of the likely damage to delta development processes operating in Little Vermilion Bay.

3.4 Non-Vegetated Terrace with Distributary Network Alternative

This alternative would include terraces and dredging of distributary channels, but no vegetative plantings on the terraces. However, terraces will likely erode within 12-24 months unless planted, allowing erosion of existing wetlands to continue at current rates and may delay the development of subaerial delta deposits and subsequent natural wetland creation. This alternative was rejected because it would probably delay subaerial soil development and certainly allow current erosion of wetlands to continue for 10-20 years.

3.5 Preferred Alternative Vegetated Terraces 15-m wide (50') or 30-m wide (100') with Distributary Network Alternative

Dredging 17,378 meters (57,000 ft) to enhance the distributary network, combined with utilizing the material excavated to construct seven to eight meter (23-27') wide terraces, followed by vegetative plantings on the terraces was the preferred alternative. According to a Wetland Value Assessment (WVA) performed by the Environmental

Working Group of the CWPPRA, this project is expected to create approximately 40 hectares (100 acres) of new marshes as subaerial deltas develop from subaqueous deltas within the next 20 years. This approach will immediately create 28 hectares (70.0 acres) of marsh on the terraces, protect 12 hectares (30 acres) of existing marsh from shoreline erosion, and greatly increase the abundance of SAV over time. The actual cost of dredging will depend on the variable costs of dredging when bids are submitted for construction. Terrace widths will vary with soil characteristics in the project area.

3.5.1 Distributary Network

The project will use dredging to increase the capacity of five artificially induced distributary channels in the project area (Figure 4). The NMFS "net design" consists of five parallel channels of 2900 feet each would be dredged in Little Vermilion Bay (Figure 3). At approximately 700 foot intervals, perpendicular channels will be dredged for a distance of 700 feet. Alignment of perpendicular terraces alternate with every other terrace creating a terrace field (Figure 3). The net design will carry sediment from Four-Mile Canal into the project area. Enhancing the capacity of this network will facilitate spreading of a larger sediment load over a wider area than the current system is affecting by reducing water velocities over a large area. Given that sedimentation rates exceeds the rate of subsidence, the spreading of sediments is expected to create subaerial soil surfaces totaling a projected 63 hectares (157 acres) within a decade. Channel characteristics will vary with soil sediment characteristics in the project area (Figure 5).

3.5.2 Terraces

Wave energy in the bay is eroding existing wetlands fringing the bay and may be slowing development of the existing subaqueous levees and deltas into subaerial features. To reduce wave energy in the bay, dredged material excavated during enhancement of the distributary system will be placed as terraces adjacent to each dredged distributary. In addition, three rows of terraces will be constructed parallel to the shoreline of Little White Lake and three terraces will be constructed along the western side of a man-made canal within Little White Lake (Figure 4) The terraces will be planted with wetland vegetation (*Spartina alterniflora* or other suitable species) to slow their erosion. Terrace characteristics will vary with soil sediment characteristics in the project area (Figure 5). Previous work in the Little Vermilion Bay Sediment Trapping Project indicate that terraces should be approximately 5 feet

high, with a 23-27' crest width and side slopes of 1:6. The area of wetland created reflects the intertidal slopes of the terraces as well as the crests.

3.5.3 Vegetative Plantings

Unvegetated wetland soil is weaker and erodes faster than vegetated wetland soil (McGinnis 1997). Therefore, gallon containers of *Spartina alterniflora* (or other suitable species) will be planted at the base of terraces facing the greatest fetch. Sprigs of *S. alterniflora* (or other suitable species) will be planted at the base of the remaining terraces and in two-three rows across the top of the terraces.

4.0 **AFFECTED ENVIRONMENT**

Little Vermilion Bay is a shallow western extension of Vermilion Bay, which is the westernmost of four bays on the central Louisiana coast: Atchafalaya Bay, East Cote Blanche Bay, West Cote Blanche Bay, and Vermilion Bay. Prior to 1950, marshes fringing Little Vermilion Bay were brackish (O'Neil 1949), but by 1952, the Atchafalaya River had captured sufficient flow from the Mississippi River to reduce salinity and increase sediment availability in these bays (Adams and Bauman 1980, van Heerden et al. 1981). Most Atchafalaya River water is discharged into Atchafalaya Bay via one natural and one artificial channel, the Atchafalaya River and Wax Lake Outlet respectively. Natural delta building processes are operating where these channels become unconfined and have created 1,152 ha of vegetated wetlands (Evers et al. 1998). However, a portion of Atchafalaya River flow is not discharged through the Atchafalaya River or Wax Lake Outlets. This water instead enters the GIWW and is carried westward (CEI 1977).

The GIWW was constructed during the first half of this century as an east-west inland waterway to enhance the transportation of products and services by protecting these interests from wave energy in open bays and the Gulf of Mexico. Consequently, the GIWW has become a conduit for sediment-rich waters from the Atchafalaya River to Freshwater Bayou, and eventually to Little Vermilion Bay. Shallowing of the bay is resulting within the project area from sediments deposited as confined flow in Freshwater Bayou slows and spreads upon entry into Little Vermilion Bay.

4.1 **Physical Environment**

4.1.1 Geology, Soils, and Topography

Soil types in the marsh surrounding Little Vermilion Bay are classified as Clovelly-Lafitte (NRCS, 1996). Clovelly soils are

those that consist of very poorly drained, very slowly permeable, organic soils that formed in moderately thick accumulations of herbaceous plant material overlying very fluid clayey alluvium and are continuously flooded (NRCS, 1996). Lafitte soils are those that consists of very poorly drained, moderately rapidly permeable, organic soils that formed in herbaceous plant material overlying clayey alluvium and are flooded most of the time (NRCS, 1996). Topographic relief of the marshes surrounding Little Vermilion Bay is typical for coastal Louisiana, with elevations ranging from approximately 0.3-0.45 m (1-1.5 ft) National Geodetic Vertical Datum (NGVD).

Sediment cores taken from within the Four-Mile Canal project site indicate that soils there are very poor for terrace construction with low shear strengths and high compressibilities (HNTB 2002). The fourteen soil cores taken there contained very soft peat, clays and organic clays to a depth of 5 -8 feet. The surface soil horizons (3-10 feet deep) are all described as some form of very soft clay with organic material. Underlying the surface (from 3-20+ feet) most soils are described as silty clay or soft peat. At the bottom of the cores (approximately 20-25 feet) medium to stiff gray or blue-gray clays were found in most of the borings (HNTB 2002). These geotechnical results shaped the terrace design by limiting the water depth to -2.0 feet, NAVD88, to reduce the potential of failure of native soils.

4.1.2 Climate and Weather

The Little Vermilion Bay area has a subtropical climate, which is characterized by long, hot and humid summers, and short, mild and humid winters (Dugas 1970). Temperatures between May and October average between 31-32° C (88° to 90° F). Temperatures of 32° C (90° F) or higher occur approximately 100 days between May and October with an average humidity of 62 percent (Dugas 1970). Winter temperatures between November and April average 20° C (69° F) with relative humidity between 30-85 percent. Cold spells usually last no more than three days because of the dominance of warm gulf air moving inland from the coast year round. A winter temperature of 0° C (32° F) or less is expected 15 days per year and there is a 20 percent chance of temperatures falling below -6° C (20° F) during the winter (Dugas 1970).

4.1.3 Air Quality

Air quality over Little Vermilion Bay is good. Air masses are highly unstable in this area because of coastal activity. There are no industrial or automotive air emissions in the project area.

4.1.4 Surface Water Resources

The water quality of surface waters surrounding Little Vermilion Bay is good, but there are no data for the project area. The designated uses for Freshwater Bayou Canal waters (north of project area) are primary-contact recreation (e.g. swimming), secondary-contact recreation (e.g. fishing and boating), and fish and wildlife propagation (LDEQ 1997). In addition, Freshwater Bayou Canal waters are used for commercial boat traffic and drawn upon for agricultural irrigation. Designated uses of Vermilion Bay waters (south of project area) are primary-contact recreation, secondary-contact recreation, fish and wildlife propagation, and oyster propagation (LDEQ 1997).

4.2 Biological Environment

4.2.1 Vegetative Communities

Data indicate that vegetative communities have changed in response to increasing Atchafalaya River discharge. In 1949, the marshes surrounding Little Vermilion Bay were brackish (O'Neil 1949). In 1978, the boundary between intermediate and brackish marshes was mapped at the upper part of the project area (Chabreck and Linscombe 1978). Chabreck and Linscombe in 1988 classified the upper area (including Little White Lake) as intermediate and the southern area as brackish. By 1998, marshes in the nearby Little Vermilion Bay project area were intermediate (Foret, personal observation). In 1998, primary plant species in the marshes surrounding Little Vermilion Bay included *Spartina patens* (marshhay cordgrass), *Sagittaria* sp., *Scirpus californicus* (leafy three-square), *Scirpus olneyi* (three-cornered grass), *Typha* sp. (cattail), and *Cladium jamaicense* (sawgrass). Vegetative communities in the open water portion of the project area currently consist of small, scattered stands of *Myriophyllum spicatum* (Eurasian watermilfoil) and some *Ceratophyllum demersum* (coontail) and *Najas guadalupensis* (southern naiad) (Foret, J.D., A. Nyman and T. McTigue 1998)

In 1999, the Wetland Value Assessment team found the following plant species occurring around the project area: *Sagittaria* sp. (arrowhead), *Spartina patens* (marshhay cordgrass), *Spartina alterniflora* (smooth cordgrass), *Phragmites australis* (giant reed grass), *Scirpus californicus* (leafy three-square), *Typha* sp. (cattail), *Juncus roemerianus* (Needlerush), and *Cladium jamaicense* (sawgrass) (LDNR, 1999b).

There were no submersed aquatic vegetative (SAV) communities found in the open water portion of the project. High wave energy and turbidity are believed to have eliminated all SAV.

4.2.2 Essential Fish Habitat

Under the Magnuson-Stevens Fishery Conservation and Management Act, the Gulf of Mexico Fishery Management Council identified Essential Fish Habitat (EFH) for those species managed under its fishery management plans for coral and coral reefs, spiny lobster, stone crab, coastal migratory species, reef fish, red drum, and shrimp (Gulf of Mexico Fishery Management Council, 1998). The Council's EFH amendment was partially approved by the NMFS in February 1999. Habitats in and near the Four Mile Canal project area now are recognized as EFH for post-larvae, juveniles, and sub-adults of brown shrimp, white shrimp and red drum. Specific EFH microhabitats for each species and their period of habitat use in the Four Mile Canal area are shown in Table 1.

Table 1. List of species, life stages, and categories of EFH located in the project area.

Species	Life Stage	EFH
Brown shrimp	Post-larvae, juvenile, sub-adults	Marsh edge, SAV, tidal creeks, inner marsh mud bottoms
White shrimp	Post-larvae, juvenile, sub-adults	Marsh edge, SAV
Red drum	Post-larvae, juvenile, sub-adults, adults	SAV, estuarine mud bottoms, marsh/water interface, mud bottoms

4.2.3 Fish and Wildlife Resources

Although no studies of fish and crustacean populations have been conducted in Little Vermilion Bay, Vermilion Bay has been studied by several authors (CEI 1977, Coleman 1966, Dugas 1970, Fontenot 1967, Norden 1966, Perret 1965). The most abundant species found from these works were Atlantic croaker

(*Micropogonias undulatus*), hogchoker (*Trinectes maculatus*), sand seatrout (*Cynoscion arenarius*), spot (*Leiostomus xanthurus*), gulf menhaden (*Brevoortia patronus*), gafftopsail catfish (*Bagre marinus*), blue catfish (*Ictalurus furcatus*), bay anchovy (*Anchoa mitchilli*), brown shrimp (*Penaeus azetecus*), white shrimp (*Penaeus setiferus*), blue crab (*Callinectes sapidus*), and clams (*Rangia cuneata*). A complete list of fish species collected in Vermilion Bay for the period 1960-1970 can be found in Dugas (1970, Table 6).

Portions of Little Vermilion Bay have been identified by the Louisiana Department of Wildlife and Fisheries (LDWF) as an oyster seed ground, but low water salinity and high sedimentation prevent the establishment of seed production in the area. No portions of the Four-Mile Canal Terracing and Sediment Trapping project have been designated as oyster seed grounds by LDWF.

In 1990, a census of wading birds and seabird nesting colonies was conducted in Louisiana. Twenty-seven species of colonial nesting waterbirds were studied (Martin and Lester 1990). One sampling site, located on the Fearman Lake quad map, is approximately 4.5 miles southwest of the project area. Station 060 is located on Belle Isle Lake, which is within the boundary of the Paul J.H. Rainey Wildlife Sanctuary. Martin and Lester (1990) reported 73 nesting adults at Belle Isle Lake, of which, three were gull-billed terns (*Sterna nilotica*), 50 least terns (*Sterna antillarum*), and 20 black skimmers (*Rynchops niger*). Although no wading bird rookeries are listed for Little Vermilion Bay, they could be expected to feed on small fish and invertebrates in this shallow bay.

The marshes around Little Vermilion Bay provide higher quality habitat than brackish and saline marsh for nutria, raccoon, puddle ducks, and alligator (Palmisano 1973, McNease and Joanen 1978).

4.2.4 Threatened and Endangered Species

Threatened and endangered birds listed for Vermilion Parish Louisiana include the brown pelican, (*Pelecanus occidentalis*), piping plover (*Charadrius melodus*) and its critical habitat, and the Gulf sturgeon (*Acipenser oxyrinchus desotoi*) (USFWS 1992). The brown pelican, formerly extirpated from Louisiana, has been reintroduced to parts of the state. The endangered brown pelican may occasionally utilize project area water;

however, its important nesting, feeding and resting habitats are located closer to the Gulf shoreline. The threatened piping plover winters in coastal Louisiana and utilizes intertidal flats, beaches and associated dune systems, and other very sparsely vegetated areas adjacent to flats and beaches. Although critical habitat for piping plover has been designated in areas along the Louisiana coast, that species is not expected to utilize the project area, and its critical habitat does not occur there. The threatened Gulf sturgeon rarely occurs west of the Mississippi River and thus is not expected to utilize the project area.

Sea turtles have been reported along the Louisiana coast (Condrey et al. 1995). Dundee and Rossman (1989) report that Kemp's ridley (*Lepidochelys kempii*) occasionally appears along the Louisiana Gulf coast. Possible factors related to this occurrence include the widespread availability of relatively shallow water marine and estuarine habitat with high turbidity levels from proximity to the Atchafalaya River (Frazier, 1980). However, with bay depths averaging from 0.3-0.9 m (1-3 ft), Little Vermilion Bay marshes and open water areas will not likely serve as foraging and development sites for the Kemp's ridley.

Of the other four species of endangered sea turtles, leatherback (*Dermochelys coriacea*), hawksbill (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), green turtle (*Chelonia mydas*), only the loggerhead turtle and the green turtle are relatively common in the nearshore waters of the Gulf of Mexico. The loggerhead feeds on sponges, jellyfish, mollusks, crustaceans, sea urchins, fishes, seaweeds and grasses while the green turtle's diet is primarily marine grasses and macrophytic algae. The hawksbill turtle is usually found in seawaters less than 15 meters (49 feet or 8 fathoms) and feeds on invertebrates, marine grasses and macrophytic algae. The leatherback turtle is found in deeper oceanic waters and feeds primarily on jellyfish (Condrey et al. 1995). However, with bay depths averaging from 0.3-0.9 m (1-3 ft), Little Vermilion Bay marshes and open water areas will not likely serve as foraging and development sites for these species.

4.3 Cultural Environment

4.3.1 Historical or Archeological Resources

The Louisiana coastal waters have been traversed by watercraft since the earliest colonization of the region by Europeans. Native Americans utilized these waters also. At present, 42

recorded wrecks have occurred in Louisiana coastal waters. Because of the dependence on ship travel during the colonization of south Louisiana and the frequency of tropical storms in the area, there is the potential that historical ship remains may be located beneath the sediments that have accumulated during the past four or five decades.

There is the possibility of inundated prehistoric archaeological sites around Little Vermilion Bay. However, a review of the project area revealed no known sites (Rivet, personal communication).

4.3.2 Economics (Employment and Income)

Wetlands surrounding Little Vermilion Bay have great value as forage, cover, and nursery habitat for the diverse and abundant assemblage of finfish and invertebrates that are harvested by Louisiana's commercial and recreational fishers. About 90 percent of the fish harvested from the Gulf of Mexico rely on aquatic habitats such as those found around Little Vermilion Bay.

Most recent data on commercial fisheries landings (finfish, invertebrates, and alligators) for coastal Louisiana, rank Vermilion Parish third behind Plaquemines and Terrebonne Parishes. Total landings at Intracoastal City for 2001 were 303,600,000 pounds or \$22,100,000 (USDOC 2002).

4.3.3 Land Use

Present and historical land use is restricted to fish and wildlife resource management and harvest and hydrocarbon exploration and production. Muskrat, nutria, raccoon, and mink are currently harvested; with the exception of nutria, these species have probably been harvested from the project area continually since settlement. Alligator harvest has occurred in the marshes surrounding Little Vermilion Bay except during the 1960's and early 1970's when alligator populations were too low to allow sustainable harvest (Joanen et al. 1984). The area is a traditional, valuable waterfowl hunting area.

4.3.4 Recreation

The project area has been used for outdoors recreational activities for decades partly because the project area can be reached within one-half hour from inland ports. Recreational

activities in the project area depend primarily on the excellent fish and wildlife habitat provided by the marshes surrounding Little Vermilion Bay. Historically, recreational fishing, hunting, and boating, have been common, although this estuary could serve as an excellent site for migratory bird observation.

4.3.5 Noise

Little Vermilion Bay represents a state-owned, remote area that has no industry other than oil production. Ambient noise in the area would result from oil and gas exploration, boats, or wildlife.

4.3.6 Infrastructure

The project area is adjacent to Four-Mile Canal, which is an artificial route heavily used by deep water vessels traveling between inland ports and offshore oil rigs, and by commercial fishers traveling between inland ports and shrimping grounds. Four-Mile Canal is also utilized by sport hunters and fishers. The project area includes the junction of Four-Mile Canal and Little Vermilion Bay. At this junction, shipping in Four-Mile Canal is directly exposed to wave energy from Little Vermilion Bay. Wave energy from the project area is also eroding marshes that protect adjacent portions of Four-Mile Canal from wave energy in Little Vermilion Bay. The port of Intracoastal City also lies to the north of the project area and can be impacted by storm surges and hurricanes.

5.0 ENVIRONMENTAL CONSEQUENCES

To take no-action would allow current shoreline erosion rates to continue. The consequences of no-action would thus fail to protect existing wetlands that provide and protect other resources in Louisiana. No-action would also postpone, and possibly reduce, the area of wetlands created by natural sediment deposition in Little Vermilion Bay. The long-term resource benefits of the project derive primarily from increasing the amount of emergent wetlands and submersed aquatic vegetation (SAV) within the project area. These increases in emergent and submersed aquatic vegetation provide indirect natural resource benefits by increasing the abundance and quality of foraging and cover habitat for numerous wetland and estuarine wildlife and fish species. The increases in emergent marsh and SAV also provide indirect infrastructure benefits by reducing wave energy on shipping in Freshwater Bayou and infrastructure within the bay. In general, the adverse environmental consequences of the no-action alternative exceed those of the preferred alternative. A thorough assessment of the environmental consequences of the preferred alternative is provided below.

5.1 Physical Environment

5.1.1 Geology, Soils, and Topography

The project will not affect geology. Topography will be altered in two ways. Some parts of bay will be deepened to extend and improve the efficiency of the distributary channel system carrying water from the GIWW into the bay. Much of this channel system will likely fill with sediments as the system matures over the next 10-20 years (Coleman 1988). Some areas of the bay will be converted to emergent sediment directly by the placement of dredged material. Emergent sediment will revert to shallow open water within a few years where vegetation fails to establish. Areas of emergent sediment where vegetation establishes will convert to vegetated wetland and will maintain subaerial elevation indefinitely through natural vertical accretion processes, which depend on mineral sedimentation and in situ organic matter production by marsh vegetation (Mitsch and Gosselink 1993).

The rate of sedimentation within the terraces depends on the quantity of sediment entering the site and the ability of the terraces to trap sediment. The GIWW at "The Jaws", which carries sediment from the Atchafalaya River, was found to carry 5,000 tons/day of suspended sediment (Walker et al. 1997). In contrast, the Mississippi River at the Bonnet Carre Spillway was found to carry 100,000 tons/day when the spillway was opened. The Four-mile Canal branches off from the GIWW and probably carries significantly less sediment than the GIWW itself, although no sediment load measurements have been taken. The Vermilion River also contributes sediment to the project area. Although sediment loads from the GIWW are considerably less than that of the Mississippi or Atchafalaya Deltas, there is apparently sufficient sediment for delta growth as indicated by the development of subaqueous deltas in the project area

Dredging of the distributary channels will facilitate the delivery of sediment to and between the terraces (Figure 4). Over time, the secondary distributary channels may become clogged with sediment and may need to be dredged to enable sediment delivery to the far ends of the channels.

The effects of the project on soils may also include disturbance of benthic communities, temporary increased turbidity and

possible loss of organic matter content. The physical process of dredging to create the terraces will create short-lived turbidity and may disturb existing benthic organisms. In the long-term, terrace construction should decrease turbidity by allowing suspended sediment to settle out. Benthic communities should benefit from increased habitat heterogeneity for invertebrates.

Several studies indicate that restored wetland soils have a lower percentage of organic matter than natural wetlands. Organic matter may be lost to oxidation as soils are exposed during dredging. Furthermore, organic material may be overtopped by mineral soils during construction and alluvial deposition. Zedler, (1992) found that constructed marshes, aged one to fifteen years, had less than half of the organic matter of natural marshes. However in delta environments, such as Little Vermilion Bay, restored wetlands may approach structural and functional equivalency with natural wetlands more quickly than more closed wetland ecosystem. Faulkner and Poach, (1996) found that it takes only 5 to 10 years for restored wetlands in the Atchafalaya Delta to reach functional equivalency with natural wetlands. Once construction is completed, natural soil formation processes will proceed on the newly established emergent sediments.

5.1.2 Climate and Weather

Foret (1997) estimated that the adjacent Little Vermilion sediment trapping project would create a net carbon sink of approximately $144 \pm 45 \text{ g C m}^{-2} \text{ yr}^{-1}$ (based on C storage rates in wetland soils of the Chenier Plain). Because the Four-Mile Canal project is located in the same area, a similar affect is expected. However the removal of atmospheric CO_2 will be too small to affect climate or weather.

5.1.3 Air Quality

Minor temporary adverse impacts will result from the proposed activities. Exhaust emissions from dredging equipment with airborne pollutants should be quickly dissipated by prevailing winds and be limited to the construction phase of the project.

5.1.4 Surface Water Resources

The project will create a net sink of approximately $0.5 \pm 0.1 \text{ g P m}^{-2} \text{ yr}^{-1}$, and $8.4 \pm 2.6 \text{ g N m}^{-2} \text{ yr}^{-1}$ (based on P and N storage rates in wetland soils of the Chenier Plain calculated by Foret

(1997)) but the removal of nutrients will be too small to reduce coastal eutrophication. Dredging will increase turbidity during construction, but newly created wetlands may reduce wind fetch across the bay, which will reduce turbidity following construction.

5.2 Biological Environment

5.2.1 Vegetative Communities

The project will create new habitat suitable for colonization by emergent vegetation. The emergent plant communities that develop on the new habitat are expected to be similar to existing communities found along the shoreline of the bay. The project is not anticipated to change existing vegetative communities other than by reducing shoreline erosion, which converts vegetated wetland to shallow open water.

The project is expected to increase SAV abundance to levels similar to that in other areas of coastal Louisiana where deltas are developing. In such areas, extensive SAV beds develop on the downstream side of emergent marsh (see Castellanos 1997). Thus, whereas the project area currently contains no SAV beds, numerous, extensive SAV beds are expected to develop after construction. These beds are expected to develop in areas protected from direct river flow. Such areas are expected to initially be confine to the downstream side of terraces, but to expand to include the downstream side of naturally developing marshes as subaerial delta deposits eventually develop and convert to emergent marsh. The WVA team estimated that 15-25% of open water areas would become dominated by SAV after 20 years (LDNR 1999b).

5.2.2 Essential Fish Habitat

The proposed action is designed to create coastal marsh habitat and enhance sedimentation in the outlet area of the GIWW and Four Mile Canal. Projects like this sediment trapping effort are recommended in the EFH amendment (Gulf of Mexico Fishery Management Council, 1998) as a viable approach to large-scale habitat protection and restoration in coastal Louisiana. Four Mile Canal Terracing and Sediment Trapping project will help to ensure the long-term sustainability of important habitats and the managed species that depend on those habitats during some stage in their life cycle. The need for restorative action in this area has been recognized for many years and was selected by

a public process that offered ample opportunity for public input and debate prior to funding through the CWPPRA process.

Some forms of EFH would be lost as a result of this project. However, more productive forms of EFH will be created. For example, approximately 237 acres of shallow water will be deepened, and 68 acres of shallow water will be converted to emergent marsh. In the long term, the proposed activities would improve EFH by creating marsh and protecting existing marsh. Marsh and marsh edge habitat would be increased with the survival and growth of the vegetation to be planted on the terraces. Detrital material, formed by the breakdown of emergent vegetation, would contribute to the aquatic food web of Vermilion Bay .

Short-term adverse impacts to aquatic organisms would occur during the construction phase of the project. Other temporary impacts include entrapment of slow-moving organisms during construction of the terraces, and increased turbidity in waters near dredging sites. These impacts are minor and would be limited to the immediate vicinity of action and only for the duration of dredging and terrace construction.

Coordination letters regarding EFH may be found in Appendix A.

5.2.3 Fish and Wildlife Resources

The wetlands created will be fresh to intermediate, which provides higher quality habitat than brackish and saline marsh for nutria, raccoon, eight species of puddle ducks, and alligator (Palmisano 1973, McNease and Joanen 1978). Short-term adverse impacts to fish will occur during the construction phase of the project. These impacts include smothering of non-mobile benthic organisms in dredged material deposition sites and increased turbidity in waters near the construction sites.

The emergent wetlands and associated submersed aquatic plant communities that are expected to develop should provide fish habitat similar to that at the Atchafalaya River delta, which is used by 33 species of freshwater and estuarine dependent fish species and seven species of freshwater and estuarine dependent crustaceans species (Castellanos 1997). Increases in fish and wildlife resources will result directly from creation of emergent wetlands, and, perhaps more importantly, through a large increase in interface between emergent wetlands and shallow open water.

5.2.4 Threatened and Endangered Species

The proposed project is not likely to adversely affect listed threatened and endangered species or their critical habitat.

Protection of Migratory Bird Habitat is enhanced by providing additional habitat for some species to rest and refuel during both spring and fall migration. Therefore EO 13186 of January 10, 2001 has been more than adequately addressed.

Consultation letters regarding threatened and endangered species may be found in Appendix A.

5.3 Cultural Environment

5.3.1 Historical or Archeological Resources

No impacts are anticipated to historical or archaeological resources within the project area.

5.3.2 Economics (Employment and Income)

No impacts to economic resources will result from the proposed activity.

5.3.3 Land Use

No negative impacts to current land use would result from the proposed activity in the marshes surrounding Little Vermilion Bay. An increase in the harvest of furbearers and alligators may result from the increase in supporting habitat.

5.3.4 Recreation

Some temporary adverse short-term impacts to recreation would occur (i.e. increased turbidity of surface water) as a result of dredging activity. However, the long-term impact is likely to be an increase in the opportunity for sport fishing and hunting.

5.3.5 Noise

Some temporary adverse short-term impacts to noise would occur as a result of dredging activity.

5.3.6 Infrastructure

The project will stop and reverse marsh erosion that is exposing shipping on Four-Mile Canal to wave energy from Little Vermilion Bay. The terraces and developing marshes will reverse the marsh erosion that has exposed the western side of Four-Mile Canal to wave energy from Little Vermilion Bay. The terraces and deltaic marshes that develop in the bay will also reduce exposure of well heads in the bay to wave energy.

Intracoastal City will be further protected from storms, wind, and wave energy by the establishment of terraces and development of emergent marsh. Although there are still two strips of wetland buffer between Vermilion Bay and the port, the project will provide additional buffer that may be particularly valuable in extreme storm events.

6.0 CONCLUSIONS

This report describes the environmental assessment of the Four Mile Canal Terracing and Sediment Trapping Project, which is a CWPPRA wetland restoration project. The project will use dredging to enhance natural wetland development processes in an area where those processes are currently developing but are constrained by artificial navigation channels. Material excavated during dredging will be used to construct terraces to reduce wave energy in the bay and thereby slow shoreline erosion of existing wetlands. The artificial terraces will be planted with wetland vegetation to further slow erosion. This EA concluded that there are no significant adverse environmental impacts anticipated by the implementation of the project. This conclusion is based on a comprehensive review of relevant literature, site-specific data, and project-specific engineering reports. This finding supports the recommendations of the CWPPRA Task Force, including NMFS, the sponsoring agency. The natural resource benefits anticipated from the implementation of Four-Mile Canal Sediment Trapping Project are expected to enhance and sustain the diverse ecosystem of the Vermilion Bay complex, and to partially offset coastal wetland loss occurring elsewhere.

7.0 PREPARERS

This EA was prepared by Dr. John D. Foret of NMFS-Lafayette. Figures were prepared by GOTECH, Inc. under contract to NMFS. In addition to Dr. Foret, invaluable reference material and guidance were provided by Dr. Erik Zobrist, Mr. Richard Hartman, and Ms. Joy Merino of NMFS.

8.0 FINDING OF NO SIGNIFICANT IMPACT

Based on the conclusion of this document and the available information relative to the Little Vermilion Bay Sediment Trapping Project, there would be no significant environmental impacts from this action. Furthermore, preparation of an Environmental Impact Statement on this action is not required by the National Environmental Policy Act or its implementing regulations.

for Rebecca Hunt
William T. Hogarth, Ph.D.
Assistant Administrator for Fisheries
National Marine Fisheries Service

4/25/03
Date

9.0 LITERATURE CITED

- Adams, R.D. and R.H. Bauman. 1980. Land Building in Coastal Louisiana: Emergence of the Atchafalaya Bay Delta. Louisiana Sea Grant Collect Program. Louisiana State University, Baton Rouge, Louisiana. LSU-T-80-02.
- Barras, J.A. P.E. Bourgeois, and L.R. Handley. 1994. Land Loss in Coastal Louisiana 1956-90. National Biological Survey, National Wetlands Research Center Open File Report 90-01. 4 pp. 10 color plates.
- Boesch, D.F, D. Levin, D. Nummedal, and K. Bowles. 1983. Subsidence in Coastal Louisiana: Causes, Rates, and Effects on Wetlands. U.S. Fish and Wildlife Service, Division of Biological Services, Washington, D.C. FWS/OBS-83/26. 30 pp.
- Boyer, M.E., J.O. Harris, and R.E. Turner. 1997. Constructed crevasses and land gain in the Mississippi River Delta. *Restoration Ecology* 5:85-92.
- Castellanos, D.L. 1997. Nekton use of submersed aquatic vegetation, marsh, and shallow unvegetated bottom in a Louisiana tidal freshwater ecosystem. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 79pp.
- CEI. 1977. A jetty from Point Chevreuil: an evaluation of a proposal to reduce sedimentation in the Cote Blanche Bays and Vermilion Bay. Coastal Environments Incorporated. Baton Rouge, Louisiana. 60pp.
- Chabreck, R.H and G. Linscombe. 1978. Vegetative type map of the Louisiana coastal marshes. Louisiana Department of Wildlife and Fisheries. Baton Rouge, Louisiana.
- Chabreck, R.H. and G. Linscombe. 1988. Louisiana Coastal Marsh Vegetative Type Map. New Orleans, Louisiana Department of Wildlife and Fisheries.
- Coleman, James. 1966. Recent coastal sedimentation of the central Louisiana coast. Louisiana State University Press, Coastal Studies Series No. 17. 71 pp.
- Coleman J.M. 1988. Dynamic changes and processes in the Mississippi River delta. *Geol. Soc. Am. Bull.* 100:999-1015.
- Condrey, R., P., Kemp, J. Visser, J. Gosselink, D. Lindstedt, E. Melancon, G. Peterson, and B. Thompson. 1995. Status, Trends, and Probable Causes of Change in Living Resources in the Barataria and Terrebonne Estuarine Systems. BTNEP Publ. No. 21, Barataria-Terrebonne National Estuary Program, Thibodaux, Louisiana, 434 pp.

- Craig, N.J., R.E. Turner, and J.W. Day, Jr. 1979. Land loss in coastal Louisiana. pages 227-254 In J.W. Day Jr. et al. (eds.) Proceedings of the third Coastal Marsh and Estuary Management Symposium. Louisiana State University, Division of Continuing Education. Baton Rouge, Louisiana.
- Dugas, Ronald J. 1970. An Ecological Survey of Vermilion Bay 1968-1969. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 107 pp.
- Dundee, H.A., and D.A. Rossman. 1989. The Amphibians and Reptiles of Louisiana. Louisiana State University Press. Baton Rouge and London. 300 pp.
- Edwards, W.P., III. 1998. Personal communication. Vermilion Land Corporation. Abbeville, Louisiana.
- Evers, D.E., C.E. Sasser, J.G. Gosselink, D.A. Fuller, and J.M. Visser. 1998. The impact of vertebrate herbivory on wetland vegetation in Atchafalaya Bay, Louisiana. *Estuaries* 21:1-13.
- Faulkner, S.P. and M.E. Poach. 1996. Functional comparison of created and natural wetlands in the Atchafalaya Delta, Louisiana. Wetlands Research Program Technical Report WRP-RE-16. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS
- Fontenont, B.J. 1967. Seasonal relative abundance and distribution of postlarval white and brown shrimp in Vermilion and Cote Blanche Bay. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 101 pp.
- Foret, J.D. 1997. Accretion, sedimentation, and nutrient accumulation rates as influenced by manipulations in marsh hydrology in the Chenier Plain, Louisiana. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 56pp.
- Foret, J.D., A. Nyman and T. McTigue. 1998. Environmental assesment of Little Vermilion sediment trapping project. U.S. Dept. of Commerce, Nationa Oceanic and Atmospheric administration, National Marine Fisheries Service, Silver Spring, MD.
- Foret, J.D. 2002. Personal communication. National Marine Fisheries Service. Lafayette, Louisiana.
- Frazier, J.G. 1980. Marine Turtles and Problems in Coastal Managemen, pp. 2395-2411. In B.L. Edge (ed.). Coastal Zone 80: Proceedings of the Second Symposium on Coastal and Ocean Management. American Society of Engineers, New York.
- Gulf of Mexico Fishery Management Council. 1998. Generic amendment for addressing Essential Fish Habitat requirements in the following fishery

management plans of the Gulf of Mexico: Shrimp Fishery of the Gulf of Mexico, United States Waters; Red Drum Fishery of the Gulf of Mexico; Reef Fish Fishery of the Gulf of Mexico; Coastal Migratory Pelagic Resources (Mackerels) in the Gulf of Mexico and South Atlantic; Stone Crab Fishery of the Gulf of Mexico; Spiny Lobster in the Gulf of Mexico and South Atlantic; Coral and Coral Reefs of the Gulf of Mexico (includes environmental assessment). Gulf of Mexico Fishery Management Council. Tampa, FL.

Hess, T. 1998. Personal communication. Department of Wildlife and Fisheries Fure and Refuge Division, Rockefeller State Wildlife Refuge and Game Preserve, Grand Chenier, Louisiana.

HNTB Corporation. 2002. Four Mile Canal Terracing and Sediment Trapping Project (TV-18), Data Collectin and Analysis Feasibility Report. Baton Rouge, Louisiana. 35 pp.

Joanen, T., L. McNease, G. Perry, D. Richard, and D. Taylor. 1984. Louisiana's alligator management program. Proc. Southeastern Assoc. Fish Wildlife Agencies. 38:201-211.

LDEQ. 1997. Environmental Regulatory Code. Part IX. Water Quality Regulations. 672 pp.

LDNR. 1993. Sabine terracing project annual monitoring report. Biological Monitoring Section, Coastal Restoration Division, Louisiana Department of Natural Resources. Baton Rouge, Louisiana.

LDNR. 1996a. Small sediment diversions (MR-01) Progress Report No. 2. Louisiana Department of Natural Resources, Coastal Restoration Division. Baton Rouge, Louisiana.

LDNR. 1996b. Dewitt-Rollover plantings (ME-08) comprehensive monitoring report. Louisiana Department of Natural Resources, Coastal Restoration Division, Baton Rouge, Louisiana.

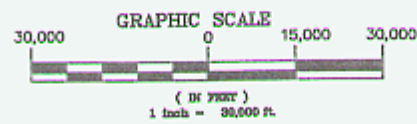
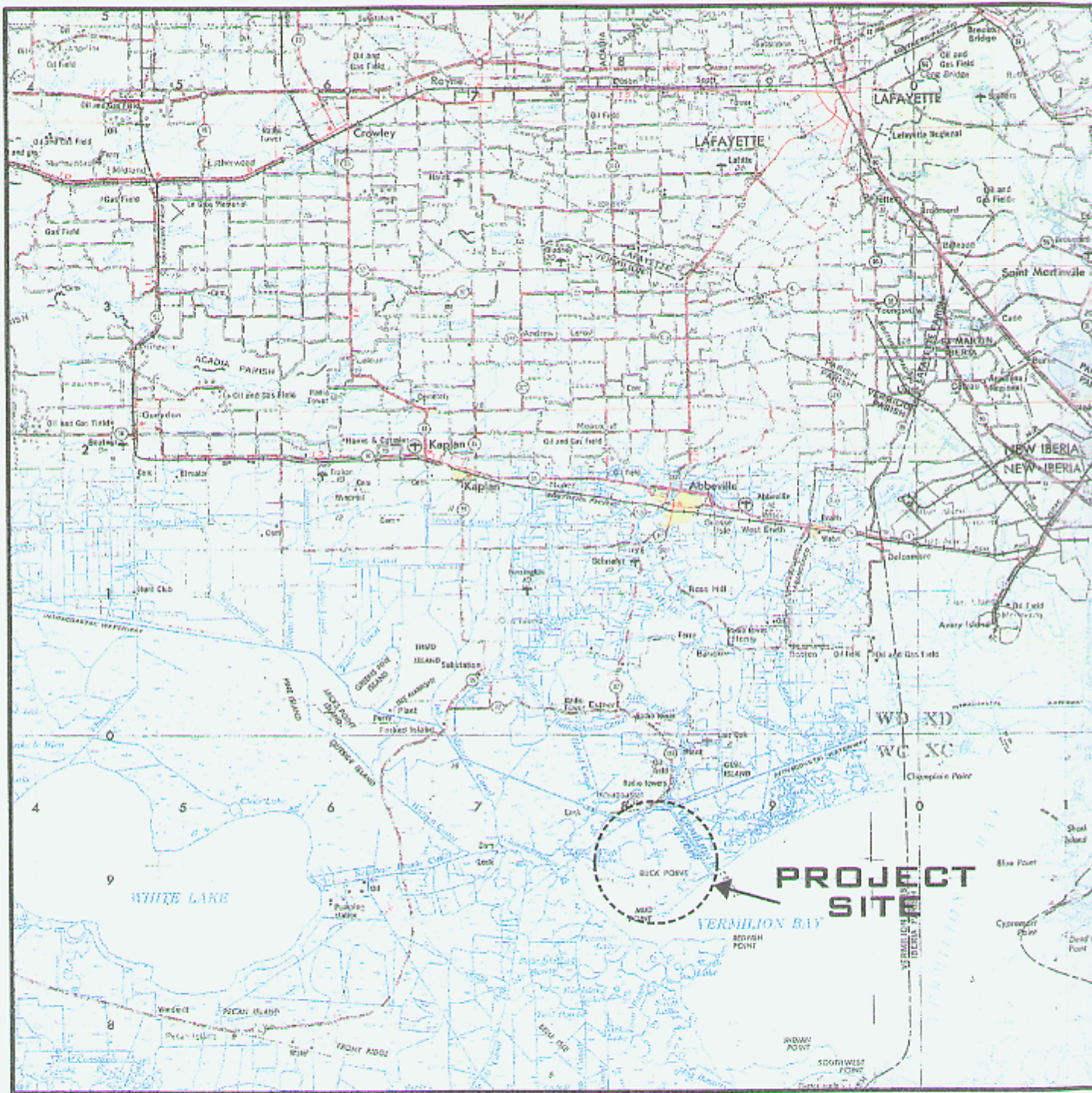
LDNR. 1997a. Boston Canal/Vermilion Bay Shoreline Protection (TV-0). Progress report no. 3. Louisiana Department of Natural Resources, Coastal Restoration Division, Baton Rouge, Louisiana.

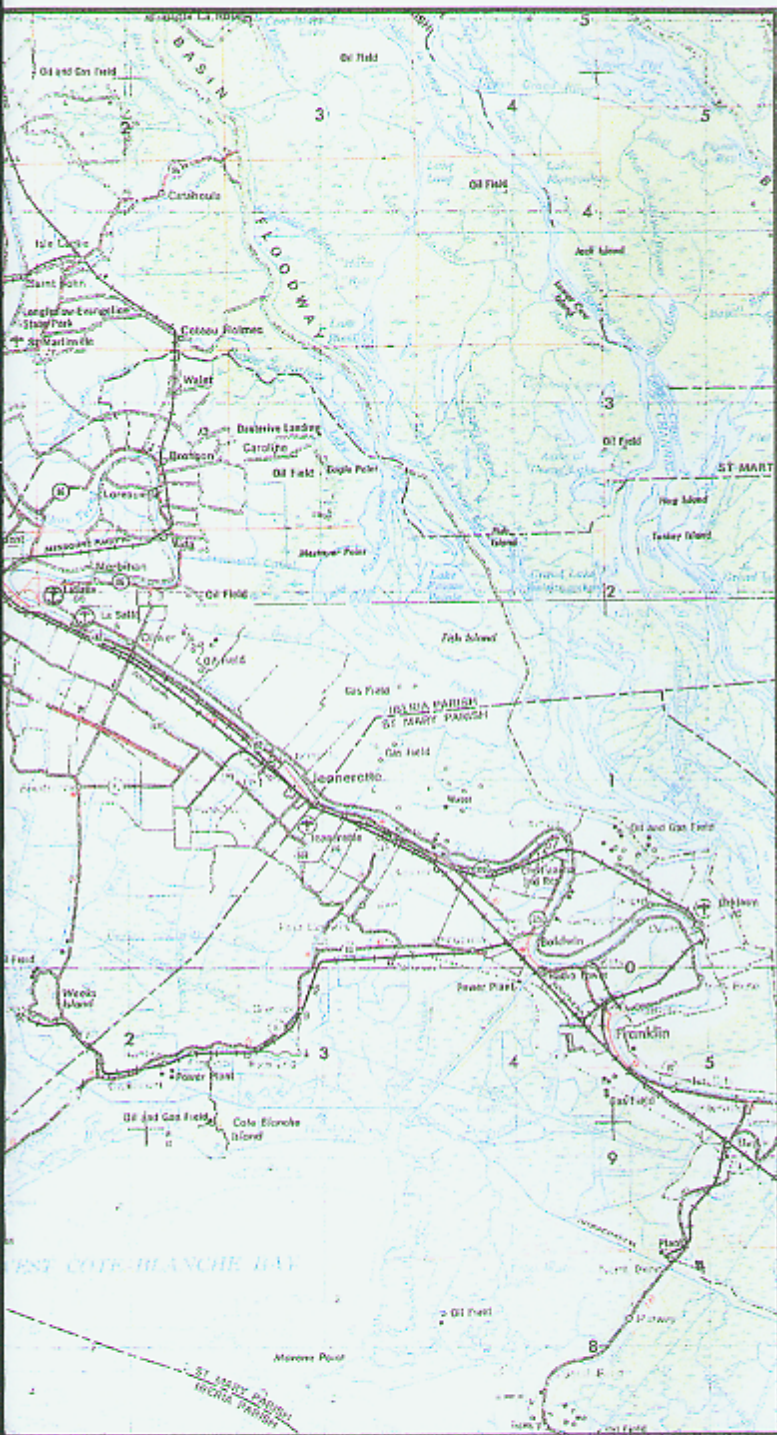
LDNR. 1997b. Vermilion River cutoff (TV-03). Progress report no. 3, for the period August 20, 1996 to February 16, 1998. Louisiana Department of Natural Resources, Coastal Restoration Division, Baton Rouge, Louisiana.

- LDNR. 1999a. Coast 2050: Toward a sustainable coastal Louisiana, Appendix B - Technical Methods. report of the Louisiana Coastal Wetland Conservation and Restoration Task Froce and the Wetland Conservatoin and Restoration Authority. Louisiana Department of Natural Resources, Baton Rouge, Louisiana.
- LDNR. 1999b. Four-Mile Canal Marsh Creation. Candidate Project Information Sheet for Wetland Value Assessment. Contacts: Pat Williams and Cheryl Brodnax. 9 pp.
- LDNR. 1999c. Coastal Wetlands Planning, Protection, and Restoration Act. Summary of Priority Project List 9. Louisiana Department of Natural Resources, Coastal Restoration Division, Baton Rouge, Louisiana. ?? pp.
- Martin, R.P. and G.D. Lester. 1990. Atlas and Census of Wading Bird and Seabird Nesting Colonies in Louisiana: 1990. Louisiana Department of Wildlife and Fisheries, Louisiana Natural Heritage Program, Special Publication No. 3. 182 pp.
- McGinnis, T.E. 1997. Shoreline movement and soil strength in a Louisiana coastal marsh. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 80pp.
- McNease, L., and T. Joanen. 1978. Distribution and relative abundance of the alligator in Louisiana coastal marshes. Proc. Southeastern Assoc. Fish Wildlife Agencies. 32:182-186.
- Minello, T. J. and L. P. Rozas. 2002. Nekton in Gulf Coast wetlands: fine-scale distributions, landscape patterns, and restoration implications. Ecological Applications, 12: 441-445.
- Mitsch, W. J. and J. G. Gosselink (eds.). 1993. Wetlands. Second Edition. Von Nostrand Reinhold Publishing, New York. 722 pp.
- Morgan, J.P., J.R. Van Lopik, and L.G. Nichols. 1953. Occurrence and Development of Mudflats Along the Western Louisiana Coast. Coastal Studies Institute, Louisiana State University Tech. Report. 2. 34 pp.
- Norden, Carrol R. 1966. The seasonal distribution of fishes in Vermilion Bay, Louisiana. Wisconsin Academy of Sciences, Arts and Letters, 55: 119-137.
- NRCS. 1996. Soil Survey of Vermilion Parish, Louisiana. Natural Resources Conservation Service, U.S. Department of Agriculture in cooperation with Louisiana Agricultural Experiment Station. 183 pp.

- Nyman, J.A., R.H. Chabreck, and N. Kinler. 1993. Some effects of herbivory and 30 years of weir management on emergent vegetation in a brackish marsh. *Wetlands*. 13(3):165-175.
- O'Neil T. 1949. The muskrat in the Louisiana coastal marshes. Federal Aid Section-Fish and Game Division, Louisiana Department of Wild Life and Fisheries, New Orleans, Louisiana. *Proc. Southeastern Assoc. Game Fish Comm.* 19:78-92.
- Orton, E. W. 1959. A geological study of Marsh Island, Iberia Parish, Louisiana. Louisiana Wild Life and Fisheries Comm. New Orleans, Louisiana. 22 pp.
- Palmisano, A.W. 1973. Habitat preference of waterfowl and fur animals in the northern Gulf Coast marshes. pages 163-190 In R.H. Chabreck (ed.) *Proceedings of the Coastal Marsh and Estuary Management Symposium*. Louisiana State University, Division of Continuing Education. Baton Rouge, Louisiana.
- Penland, S., and J.R. Sutter. 1990. The geomorphology of the Louisiana Chenier Plain. *Mar. Geol.* 90:231-258.
- PENSCO (Professional Engineering and Surveying Company, Inc.). 1998. Little Vermilion Bay Sediment Trapping Project (T/V-12, PTV-19). Specifications and Contract Documents. Lafayette, Louisiana.
- PENSCO (Professional Engineering and Surveying Company, Inc.). 2000. Little Vermilion Bay Sediment Trapping Project (T/V-12, PTV-19). Engineering Summary Report. Lafayette, Louisiana.
- Perret, William S. 1965. Occurrence, abundance, and size distribution of fishes and crustaceans collected with otter trawl in Vermilion Bay, Louisiana. M.S. Thesis, University of Southwestern Louisiana, Lafayette, Louisiana. 87 pp.
- Rivet, D. 1998. Personal communication. State Historical Preservation Office, Baton Rouge, Louisiana.
- Templet, P.H. and K.J. Meyer-Arendt. 1988. Louisiana Wetland Loss: A Regional Water Management Approach to the Problem. *Environmental Management* 12: 181-192.
- Turner, R.E. and D.R. Cahoon (eds.). 1988. Causes of Wetland Loss in the Coastal Central Gulf of Mexico. Volume 1: Executive Summary. Final report submitted to Minerals Management Service, New Orleans, LA. Contract No. 14-12-0001-30252. OCS Study/MMS 87-0119. 32 pp.

- Turner, R.E., R. Constanza, and W. Scaife. 1982. Canals and Wetland Erosion Rates in Coastal Louisiana: Causes, Consequences and Options. U.S. Fish and Wildlife Service, Office of Biological Services, FWS-OB 82-59.
- USDOC. 2002. Fisheries of the United States, 2001. Prepared by the National Marine Fisheries Service, Office of Science and Technology, Fisheries Statistics and Economics Division. Government Printing Office, Washington, D.C. 126 pp.
- USFWS. 1992. Endangered and Threatened Species of the Southeastern United States (The Red Book). Prepared by Ecological Services, Division of Endangered Species, Southeast Region, Government Printing Office, Washington, D.C. 1,438 pp. (two volumes). Red Book Update Number 5. January 1995.
- van Heerden, I. L., J.T. Wells, and H.H. Roberts. 1981. Evolution and morphology of sedimentary environments, Atchafalaya Delta, Louisiana. *Trans. Gulf Coast Assoc. Geol. Soc.* 31:399-408.
- Walker, N., A. Hammack, R. Cunningham, and H Roberts. 1997. Satellite observations of circulation, sediment distribution and transport in the Atchafalaya-Vermilion Bay system. Coastal Studies Institute, Louisiana State University, Baton Rouge, Louisiana. 88 pp.
- Wells, J.T., and G.P. Kemp. 1981. Atchafalaya mud stream and recent mudflat progradation: Louisiana Chenier Plain. *Trans. Gulf Coast Assoc. Geol. Soc.* 31:409-416.
- Zedler, 1992. Restoring Cordgrass Marshes in Southern California. In Gordon W. Thayer (ed.). *Restoring the nation's marine environment*. Maryland Sea Grant, College Park, Maryland.





4 MILE CANAL TERRACING AND SEDIMENT TRAPPING

for
National Marine Fisheries Service
N.O.A.A.
U.S. Department of Commerce



FIGURE 1



G O T E C H , I N C .

VICINITY MAP

CONSULTING ENGINEERS	8383 BLUEBONNET BLVD.	BATON ROUGE, LA. 70810
Date: OCT, 2002	Job No.: 275	File: 4 MILE CANAL
Approved By: BKD	Checked By: BKD	Drawn By: DAB



INTRACOASTAL CITY

INTRACOASTAL WATERWAY

VERMILION RIVER

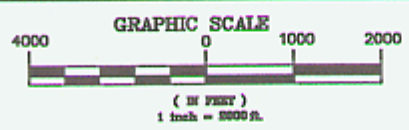
VERMILION BAY

TERRACES & BORROW CHANNEL
LITTLE WHITE LAKE

HAZARD AREA

TERRACES & BORROW CHANNEL

BUCK POINT





4 MILE CANAL TERRACING AND SEDIMENT TRAPPING

for
National Marine Fisheries Service
N.O.A.A.
U.S. Department of Commerce



FIGURE 2

SITE MAP

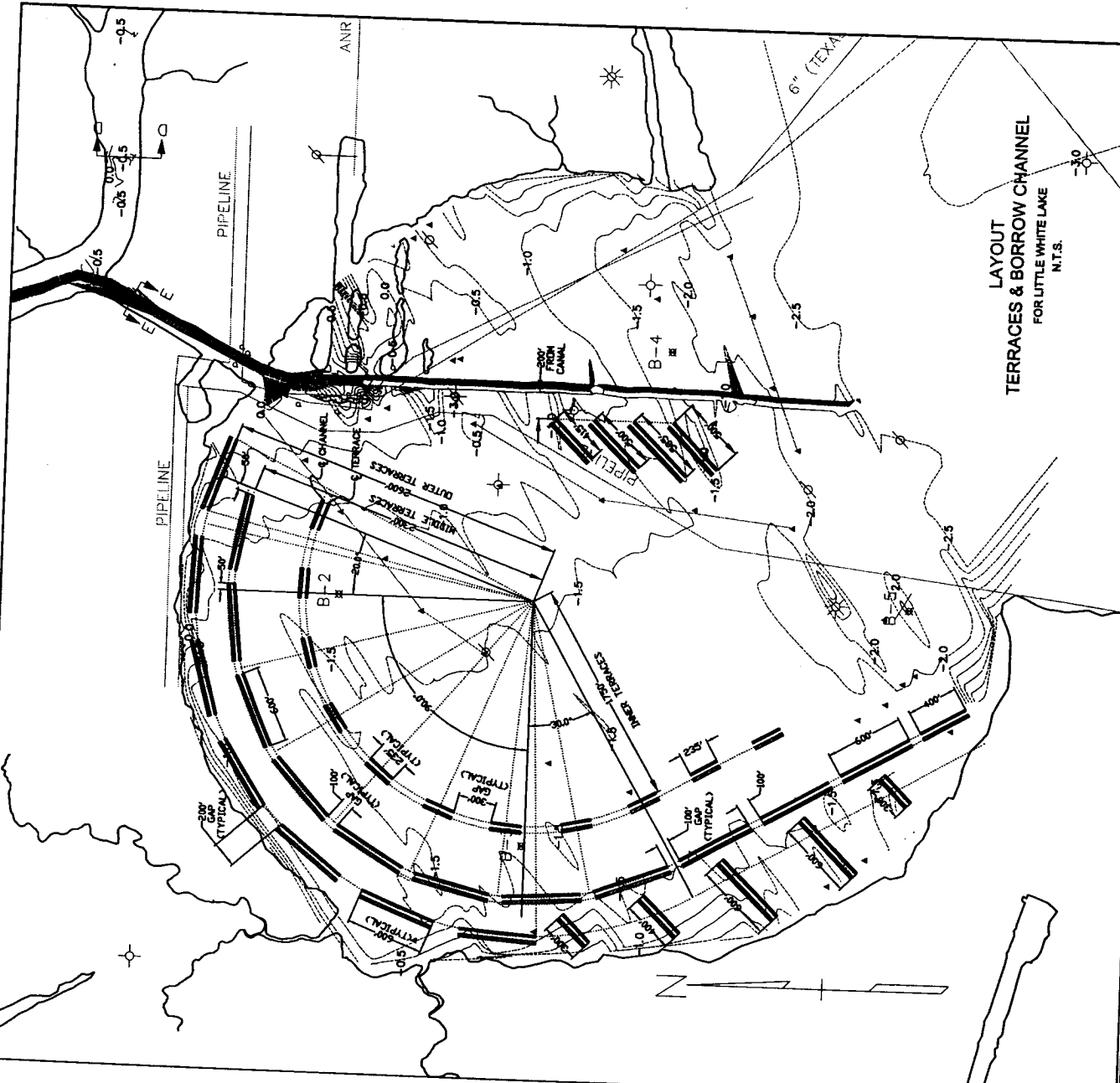


G O T E C H , I N C .

CONSULTING ENGINEERS 8383 BLUEBONNET BLVD. BATON ROUGE, LA. 70810

Date:	OCT. 2002	Job No.:	275	File:	4 MILE CANAL
Approved By:	BKD	Checked By:	BKD	Drawn By:	DAB

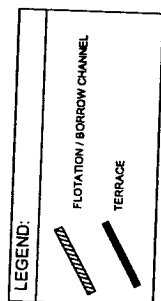
Figure 4



LAYOUT
TERRACES & BORROW CHANNEL
FOR LITTLE WHITE LAKE
N.T.S.

VOLUME/AREA QUANTITIES:

LENGTH OF TERRACES (FEET).....	15,100
TERRACE FOOT PRINTS (ACRES).....	72
MATERIALS DISCHARGED (CU YDS).....	78,000
AREA OF WETLANDS CREATED (ACRES).....	20



- GENERAL NOTES FOR LITTLE WHITE LAKE**
1. FLOTATION CHANNEL CAN BE DUG IN VICINITY OF BORROW NO. 2 OR IN SOUTH OF THE LAKE. NOTE EXISTING PIPELINES.
 2. FLOTATION CHANNELS SHALL BE DUG ON THE LAND SIDE OF THE TERRACES.
 3. CONTRACTOR SHALL NOTIFY LOUISIANA ONE CALL AT 1-800-272-3020, 48 HOURS PRIOR TO DIGGING IN ORDER TO LOCATE UTILITY LINES.
 4. VALUES DETERMINED AND USED FOR THIS PROJECT:
AVERAGE ANNUAL HIGH WATER ELEVATION = 1.87 MANDRS
AVERAGE ANNUAL LOW WATER ELEVATION = 1.87 MANDRS
*GAGE DATA OBTAINED FROM USGS RECORDS FOR CYPRESSPORT POINT, LA WHICH IS TO THE EAST OF THE PROJECT.

NO.	DATE	BY	REVISION DESCRIPTION	DESIGNED	HCM	DATE	SHEET	12/02	BY
				CHECKED	REVIEWED				
				GNTB BATON ROUGE, LA					
				FOUR-MILE CANAL TERRACING AND SEDIMENT TRAPPING LITTLE WHITE LAKE AND VERMILION BAY VERMILION PARISH, LOUISIANA					
				PARTY	VERMILION				
				PROJECT NO.	TV-18/ XTV-30				
				STATE PROJECT	DNR NO. 2511-02-09				
				SHEET NUMBER	2 of 4				

Appendix A
Agency Coordination Letters



National Oceanic and Atmospheric Administration
 NATIONAL MARINE FISHERIES SERVICE
 SEFC/Estuarine Habitats & Coastal Fisheries Center
 646 Cajundome Boulevard
 Lafayette, Louisiana 70506

December 3, 2002

LAUREL WYCKOFF

Ms. Geri Hobdy,
 State of Louisiana
 Office of the Lieutenant Governor
 Office of Cultural Development
 Division of Archaeology
 P.O. Box 44247
 Baton Rouge LA 70804-4247

Date: 12-24-02
 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.
 Laurel Wyckoff: *Laurel Wyckoff*
 State Historic Preservation Office

Dear Ms. Hobdy,

Please find enclosed an environmental assessment concerning the Four-Mile Canal Terracing and Sediment Trapping Project (TV-18), funded under the Coastal Wetlands Planning, Protection, and Restoration Act.

We would greatly appreciate your review of this document. The Four-Mile Canal project will enhance the capacity of this area to trap sediments, reduce shoreline erosion, and contribute to the continued existence of this unique system. Please return your comments to my office no later than January 10, 2003.

Sincerely,

John D. Foret
 John D. Foret, Ph.D.
 NMFS Project Manager

Enclosure

RECEIVED
 DEC - 5 2002
 DIVISION OF ARCHAEOLOGY





UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312, FAX 570-5517
<http://caldera.sero.nmfs.gov>

JAN 17 2003

F/SER3:KPB

John D. Foret, Ph.D.
NMFS Project Manager
SEFC/Estuarine Habitats & Coastal Fisheries Center
National Marine Fisheries Service
646 Cajundome Boulevard
Lafayette, LA 70506

Dear Dr. Foret: *John*

We have received and reviewed your letter dated November 25, 2002, and associated documents regarding the Four-Mile Canal Terracing and Sediment Trapping Project and possible effects on the species listed under the Endangered Species Act (ESA) and under the purview of the National Marine Fisheries Service (NOAA Fisheries) pursuant to the intra-agency consultation requirements of section 7 of the Endangered Species Act of 1973 (ESA). Please refer to consultation number I/SER/2002/01443 in future correspondence on this project.

The purpose of the project is to directly create wetlands by dredged material and sediment trapping, increase the amount of wetlands, and create habitat through vegetative plantings. Material excavated during dredging will be used to construct terraces to reduce wave energy and slow erosion of the existing wetlands in and around the eastern end of Little Vermillion Bay to offset marsh loss in coastal Louisiana. The water depth in Little Vermillion Bay presently ranges from 1-3 feet which is presently utilized by few wildlife species.

ESA-listed species under the purview of NOAA Fisheries which are considered under this ESA section 7 consultation include the green (*Chelonia mydas*), loggerhead (*Caretta caretta*), Kemp's ridley (*Lepidochelys kempii*), leatherback (*Dermochelys coriacea*), and hawksbill (*Eretmochelys imbricata*) sea turtles, and the Gulf sturgeon (*Acipenser oxyrinchus desotoi*). No critical habitat has been designated for these species within the project area. Gulf sturgeon are not believed to occur in the action area, which is west of Lake Pontchartrain. Of the five species of sea turtles known to occur in the Gulf of Mexico, only the Kemp's ridley is documented to occur near the project area. However, due to the relatively shallow water depth of the project area (1-3 feet), Little Vermillion Bay marshes and nearby open water environments will unlikely serve as foraging sites and development sites for the Kemp's ridley; therefore, it is unlikely to be affected by this project.

We concur with your draft determination that the proposed activity will not likely adversely affect endangered and threatened species, or their critical habitat, under the purview of NOAA

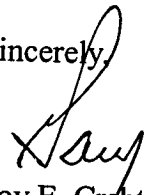


Fisheries. Although no marine listed species are likely to occur in the project area, we believe that the Environmental Assessment (EA) would be improved, and project review would be expedited, if the EA provided relevant descriptions of listed species and relevant habitat associations relevant to the project. We recommend analysis of all the possible effects to listed species that justify the finding of no significant impact. This concludes consultation responsibilities under section 7 of the ESA. Consultation should be reinitiated if there is a take, new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat designated that may be affected by the identified activity.

Your draft EA indicates modifications to essential fish habitat as a result of the terracing and sedimentation project. Pursuant to the essential fish habitat consultation requirements of the Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. 1855(b)(2) and 50 CFR 600.905-.930, Subpart K), the NOAA Fisheries Habitat Conservation Division (HCD) is being copied with this letter. The HCD biologist for this region is Mr. Richard Hartman. If you have any questions about consultation regarding essential fish habitat for this project, please contact Mr. Hartman at (225) 389-0508.

We look forward to our continuing cooperation. If you have any questions, please contact Kyle Baker, fishery biologist, at the number above or via e-mail at Kyle.Baker@noaa.gov.

Sincerely,


for, Roy E. Crabtree, Ph.D.
Regional Administrator

cc: F/PR3

F/SER44 - Richard Hartman

O:\SECTION7\INFORMAL\NMFS 4-mi Canal Terracing Project.wpd

File: 1514.22.E.

No. I/SER/2002/01443



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, Florida 33702

January 29, 2003

F/SER44/KS:jk
225/389-0508

Dr. John D. Foret, Project Manager
National Marine Fisheries Service
Southeast Fisheries Center
Estuarine Habitats and Coastal Fisheries Center
646 Cajundome Boulevard
Lafayette, Louisiana 70506

Dear Dr. Foret:

John

The Baton Rouge Field Office of the National Marine Fisheries Service (NOAA Fisheries) has received the draft Environmental Assessment (EA) titled "**FOUR-MILE CANAL TERRACING AND SEDIMENT TRAPPING PROJECT (XTV-30/TV-18); Vermilion Parish, Louisiana**" transmitted by your January 10, 2003, letter. The draft EA evaluates the potential impacts associated with the dredging of 237 acres of shallow water bottom and the construction of vegetated earthen terraces to create approximately 68 acres of intermediate marsh. The purpose of the project is to increase the area of marsh and submerged aquatic vegetation (SAV) in Little Vermilion Bay by enhancing natural sediment deposition that is occurring in the bay via Four-Mile Canal. The project was funded under the auspices of the Coastal Wetlands Planning, Protection and Restoration Act, with NOAA Fisheries serving as the Federal sponsor.

NOAA Fisheries has reviewed the draft EA and finds that the document adequately addresses potential impacts to resources of concern. However, we have the following comments regarding information provided within the document:

General Comments

The draft EA does not contain an explicit statement initiating Essential Fish Habitat (EFH) consultation. However, based on the inclusion of an EFH assessment in the document, we presume it is your intention to initiate consultation with your submission of the draft EA for our review. Specific comments on the EFH assessment are listed below.

The acreage and hectares of marsh created and/or protected by the project are not consistent throughout the document (e.g., Sections 2.3, 3.5, and 3.5.1). In addition, there are no acreage estimates for the SAV areas expected to be created. These values should be clarified in the document and used consistently. In addition, there is an error in the conversion of total number of hectares to total number of acres of marsh created and/or protected by the project which needs to be corrected (page 11, Section 2.3, paragraph 2).

Specific Comments

Section 4.0 AFFECTED ENVIRONMENT

Section 4.1 Physical Environment

Section 4.1.1 Geology, Soils, and Topography



Page 15, paragraph 1. This paragraph states that the soils in the project area are very poor for terrace construction. The document should state how this problem will be addressed given that terrace construction is the central component of the project.

Section 4.2.2 Essential Fish Habitat

Page 17, Table 1. The caption for Table 1 should state that it lists the species, life stages, and categories of EFH located in the project area, rather than a summary of EFH requirements for species managed by the Gulf of Mexico Fishery Management Council. Also, marsh edge is listed twice in the EFH columns for brown and white shrimp; the second reference should be deleted. In addition, tidal creeks and mud bottoms should be removed from the EFH column for white shrimp, and marsh ponds should be added to that column (if they exist in the project area).

Page 17, paragraph 3. This paragraph should be moved to Section 5.2.2.

Section 5.0 ENVIRONMENTAL CONSEQUENCES Sections 5.2.4-5.3.5

These sections are missing from the document.

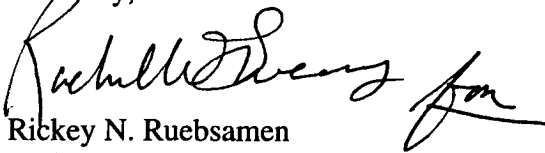
Section 5.3.6 Infrastructure

Page 27, paragraph 2. This paragraph discusses a liner at the outlet of Four-Mile Canal. Since this structure is no longer a component of the project, the reference should be deleted.

NOAA Fisheries finds that the document adequately addresses potential impacts to resources of concern. We concur with your determination that while certain categories of EFH would be adversely impacted by project implementation, more productive categories of EFH, such as marsh, marsh fringe, and SAV, would be protected and restored. Therefore, we have no EFH Conservation Recommendations to provide.

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

Sincerely,



Rickey N. Ruebsamen
Acting Assistant Regional Administrator
Habitat Conservation Division

c:
FWS, Lafayette
EPA, Dallas
NRCS, Alexandria
COE, Planning
DNR, Consistency
F/SER4
Files



United States Department of the Interior

FISH AND WILDLIFE SERVICE

646 Cajundome Blvd.
Suite 400
Lafayette, Louisiana 70506

RECEIVED

JAN 13 2003

January 10, 2003

NMFS, LAFAYETTE

John D. Foret, Ph.D.
Project Manager
National Marine Fisheries Service
646 Cajundome Boulevard
Lafayette, LA 70506

Dear Dr. Foret:

The Fish and Wildlife Service (Service) has reviewed the draft Environmental Assessment (EA) for the Four-Mile Canal Terracing and Sediment Trapping Project. That project would be constructed under the authority of the Coastal Wetlands Planning, Protection and Restoration Act. The Service submits the following comments in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.), the Endangered Species Act of 1973, as amended, and the National Environmental Policy Act of 1969.

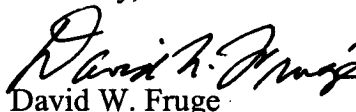
The EA is well written and adequately describes the impact of the project to fish and wildlife resources. We are providing the following specific comments for your consideration.

In the threatened and endangered species discussion in Section 4.2.4 (page 19), the most current list of species should be used to evaluate the impacts of the project. The list of threatened and endangered species for Vermilion Parish, prepared by the Service in 2002, includes the brown pelican, piping plover and its critical habitat, Gulf sturgeon, and the five species of sea turtles discussed in the section. It is not necessary to include the other species discussed in this section. The endangered brown pelican may occasionally utilize project area waters; however, its important nesting, feeding and resting habitats are located closer to the Gulf shoreline. The threatened Gulf sturgeon rarely occurs west of the Mississippi River and thus is not expected to utilize the project area. The threatened piping plover winters in coastal Louisiana and utilizes intertidal flats, beaches and associated dune systems, and other very sparsely vegetated areas adjacent to flats and beaches. Although critical habitat for piping plover has been designated in areas along the Louisiana coast, that species is not expected to utilize the project area, and its critical habitat does not occur there.

In the environmental consequences section on page 26, the discussion should be revised to state that the proposed project is not likely to adversely affect listed threatened and endangered species or their critical habitats.

The Service fully supports the measures proposed for the Four-Mile Canal Terracing and Sediment Trapping Project. Thank you for the opportunity to provide comments on the EA. If you have any questions regarding our comments, please contact Gerry Bodin of this office at (337)291-3118.

Sincerely,



David W. Fruge
Supervisor
Louisiana Field Office

cc: NMFS, Baton Rouge, LA
EPA, Dallas, TX
U.S. Army Corps of Engineers, New Orleans, LA
NRCS, Alexandria, LA
LA Dept. of Wildlife and Fisheries, Baton Rouge, LA
LA Dept. of Natural Resources (CRD), Baton Rouge, LA

SUBJECT: EA of Four-Mile Canal Terracing and Sediment Trapping Project

TO: Erik Zobrist - Office of Habitat Conservation - Habitat Restoration Center

FROM: Andy LoSchiavo - Office of Habitat Conservation - Habitat Protection Division

I received an environmental assessment (EA) for a Coastal Wetlands Planning, Protection, and Restoration (CWPPRA) terracing and sediment trapping project involving Four-Mile Canal in Vermilion Parish, Louisiana. The CWPPRA findings with the New Orleans Army Corp of Engineering (ACOE) indicate that the required essential fish habitat (EFH) consultations by the Magnuson-Stevens Act may be done as a part of the CWPPRA consultation process in the form of a National Environmental Policy Act (NEPA) document. Is this EA intended to meet the consultation process as required under the EFH provisions of the Magnuson-Stevens Act? I have several comments about this EA, its process, and how it intends to indicate that it also serves as the EFH consultation process for this Federal action.

The CWPPRA finding was with the ACOE. However, in this case NOAA Fisheries (NMFS) is undertaking this EA and hence, must consult with itself. Because NMFS is consulting with itself, it should continue to generate good examples of CWPPRA/EFH consultations. Whether or not this EA serves to represent the EFH consultation process, it should be sent to the Southeast Region for review. I believe John Foret of the Lafayette, Louisiana office is the contact person. His number is 337-291-2107.

The EFH section (4.2.2) should mention that this EA meets the EFH consultation process required under section i 305 (b) of the Magnuson-Stevens Act for any Federal Action that may adversely affect EFH. I recommend adding language indicating that "the EFH sections in this document meet the consultation provisions specified under the Magnuson-Stevens Act for any Federal Action that may adversely affect EFH" or "The EFH consultation documents and process are referenced in the appendix".

In section 5.2.2 of the environmental consequences, the part describing impacts to EFH suggests that some EFH will be adversely impacted and lost. Cases such as these where EFH will be adversely impacted, NMFS must provide comments and EFH conservation recommendations on such actions [50 CFR 600.905(b)]. If this area is a spawning area for a species such as red drum, I would recommend including a recommendation or statement along the lines that "project dredging will not occur during the seasonal times that red drum are spawning."

The rest of the EFH section on environmental impacts is fine. The EA mentions that the project will create EFH and protect EFH; helping the reader understand that the project will result in a greater amount of EFH than that amount that will be lost.

I have no further comments on the EA of Four-Mile Canal Terracing and Sediment Trapping Project. I would strongly recommend considering the language mentioned by these suggestions and having the region review this document.

United States Department of Agriculture



Natural Resources Conservation Service
3737 Government Street
Alexandria, LA 71302

Water Resources Planning Staff
phone (318) 473-7690
fax (318) 473-7747

January 21, 2003

John D. Foret
NOAA-NMFS
646 Cajundome Blvd.
Lafayette, LA 70506

John,

Enclosed are the comments that I have obtained from our folks for the Four-Mile Canal Terracing and Sediment Trapping Project (TV-18).

Thank you for the opportunity to review this document.

Sincerely,

Martin D. Floyd
Martin D. Floyd
Biologist

cc Britt Paul, WRPSL, NRCS, Alexandria, LA

Four-Mile Canal Terracing and Sediment Trapping Project (TV-18)
NRCS Comments on Environmental Assessment

- pg.6, para.2, sent.9 – “Within the project ... Atchafalaya River (~~LaDNR~~ LDNR 1999b).”
- pg.7, para.2, sent.1 – “Navigation ... project area (1-3 ft) (Foret, personal communication).”
~ cite on pg. 31
- pg.7, para.3, sent.3 – “Engineering reports ... Four-Mile project area (PENSCO 1998, 2000).”
~ cite “1998” on pg. 34
- pg.7, para.3, sent.4 – “A progress report ... is available (LDNR, 1997c).” ~ cite on pg. 32
- pg.10 ~ **either add a new section or incorporate in 2.2.3: Protection of Migratory Bird Habitat is enhanced for some species in accordance with EO 13186 of January 10, 2001.** ~ or some similarly worded statement.
- pg.10, 2.2.5, sent.2 – “However, the west bank ... 1985 (~~LDNR 1997~~ 1997a) ~ is this correct?”
- pg.13, 3.5.2, sent.3 – In addition, terraces ... within ~~Little~~ Little White Lake...”
- pg.14, 4.0, para.1, sent.2 – “Prior to 1950 ... van Heerden et al 1981).”
- pg.16, 4.2.1, para.1, sent.5 – “By 1998 ... were intermediate (Foret, personal communication).”
~ cite on pg. 31
- pg.16, 4.2.1, para.1, sent.6 – “In 1998, primary plant ... *Scirpus olneyi* ...”
- pg.17, para.1 – “square), *Typha* sp. ... (~~LaDNR~~ LDNR, 1996b).”
- pg.17, 4.2.2, para.1, sent.1 – “Under the Magnuson-Stevens ... and shrimp (Gulf of Mexico Fishery Management Council, 1998).” ~ cite on pg. 31
- pg.17, 4.2.2, para.2, sent.2 – “Projects like this ... EFH amendment (Gulf of Mexico Fishery Management Council, 1998).” ~ cite on pg. 31
- pg.20, 4.3.2, para.1, sent.2 – “Total landings ... (USDOC ~~2001~~ 2002).”
- pg.26 ~ **either add a new section or incorporate in 5.2.4: Protection of Migratory Bird Habitat is enhanced by providing additional habitat for some species to rest and refuel during both spring and fall migration. Therefore EO 13186 of January 10, 2001 has been more than adequately addressed.** ~ or some similarly worded statement.

- p.31 ~ *add citation: Foret, J.D. 2002. Personal communication. (refer to pages 7 and 16)*
- p.31 ~ *add citation: Gulf of Mexico Fisheries Management Council. 1998. (refer to page 17)*
- p.32 ~ *verify citation: Hightower, M. 1998. (did not see this mentioned in text, may have overlooked it)*
- p.32 ~ *verify citation: LDNR. 1997a. (listed as 1997, refer to page 10)*
- p.32 ~ *add citation: LDNR. 1997c. (refer to page 7)*
- p.33 ~ *move citation: Minello ... 2002. (move from pg. 34)*
- p.34 ~ *add citation: PENSCO. 1998. (refer to page 7)*
- p.34 ~ *move citation: Minello ... 2002. (move to pg. 33 and alphabetize)*
- p.34 ~ *verify citation: Turner et al. 1982. (did not see this mentioned in text, may have overlooked it)*



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

APR 14 2003

MEMORANDUM FOR: F - William T. Hogarth, Ph.D.

FROM:

F/HC - Rolland A. Schmitt

SUBJECT:

Recommendation of the Issuance of a Finding of No Significant Impact (FONSI) for the Four Mile Canal Terracing and Sediment Trapping Project, Vermilion Parish, Louisiana

Under the Coastal Wetlands Planning, Protection, and Restoration Act or CWPPRA (16 U.S.C. §§ 777c, 3951-3956), the U.S. Department of Commerce is part of a multi-agency Task Force responsible for implementing a comprehensive approach to restore and prevent the loss of coastal wetlands in Louisiana. The National Marine Fisheries Service is the Federal sponsor for implementing the CWPPRA-funded Four Mile Canal Terracing and Sediment Trapping Project (CWPPRA Project No. TV-18) located in Vermilion Parish, Louisiana. The Restoration Center (RC) has coordinated the development of engineering plans and anticipates construction commence in 2003.

The RC recently reviewed the final Environmental Assessment (EA) for the project in compliance with the National Environmental Policy Act (NEPA). The EA now must be formally submitted to the Office of Strategic Planning for its concurrence.

On the basis of the information presented in the EA for the Four Mile Canal Terracing and Sediment Trapping Project, the RC believes that no significant impact to the environment will result from the proposed restoration actions.

NOAA Administrative Order 216-6 recommends that the Assistant Administrator make the determination for a Finding of No Significant Impact (FONSI) and request the concurrence and clearance of the Office of Strategic Planning. I request your concurrence with our recommendation, and the formal submittal of the EA and accompanying documents.

Attachments

I agree RL I disagree _____ Let's discuss _____

